Developing Green Roof and Wall Policy: Lessons from North America

Oslo Policy Workshop

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Steven Peck with Council Member Rafael Espinal at the launch of the Green Roof legislation in NYC

Introduction – GRHC's Role

Green Roofs for Healthy Cities (GRHC) works to establish cost-effective green roof and wall policies to recognize their public benefits and fund their widespread implementation and build the market for our members. We do this by:

- Providing seminars and hosting market-driven symposia
- Directly advocating for policy
- Generating research reports to promote informed decision making
- Providing technical support and standards for policy development

Policy Committee organizes policy educational activities, conducts outreach, profiles best practices in LAM. Co-Chaired Jeff Joslin, City of San Francisco and Hamid Karimi, District of Columbia

Technical Committee responds to detailed technical issues around policy such as construction details. Chaired by Richard Hayden, American Hydrotech

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Strong Policy Rational

The only form of infrastructure that provides cash strapped governments with the opportunity to:

- Leverage largely wasted roof and wall space in cities, where land expensive;
- Leverage private investment in new buildings
- Accomplish multiple public policy goals
- Build upon the private benefits like roof longevity and energy savings
- Create jobs in the local and regional market

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Multiple Public Benefits

Living Architecture provides an opportunity to:

- Manage stormwater through retention and detention
- Reduce energy consumption
- Mitigate the Urban Heat Island effect
- Sequester carbon
- Provide new amenity space in densifying cities
- Support biodiversity
- Improve air quality
- Improve human health and well being

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Global Policy Trend

Cities worldwide are using policy and direct investment to make better use of roof and wall space.

Mandatory green roof requirements exist in cities such as:

Tokyo
Paris
London
Toronto
Copenhagen
New York (just passed in May)
San Francisco
Porltand (Oregon)
Cordoba
Shiraz, Iran
Berlin (and many other German cities)

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New York City, NY

Mandatory Green Roof/Solar Legislation

- GRHC host CitiesAlive in New York City in 2016 and 2018
- Council member Rafael Espinal proposed mandatory green roof policy in July 2018
- In January 2019, New York City Council held a hearing on green roof policy which GRHC attended
- GRHC Technical Committee prepared written testimony, and members lobbied for the bill with other like minded associations in New York
- On April 18, 2019 New York City council passed mandatory green roof legislation!

For more information visit https://legistar.council.nyc.gov/LegislationDetail.aspx?ID=3557657&GUID=B4C3A822-2FBB-45FD-8A74-C59DD95246C1&Options=&Search=

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New York City, NY – Mandatory

Midtown High Rise

All new roofs and reconstruction of all old roofs on certain buildings must be 100% sustainable roofing zone.

Policy Details

- A sustainable roofing zone is covered in green roof systems or solar photovoltaic electricity generating systems.
- Exceptions to area that is required to be covered include: green roof systems, outdoor recreation space, ballasted roofs (with solar reflectance of .2), and more
- More details to come!

- Legislations also includes a request for a tax abatement of up to $15 per square foot which is currently before the state legislature.

For more information visit https://legistar.council.nyc.gov/LegislationDetail.aspx?ID=3557657&GUID=B4C3A822-2FBB-45FD-8A74-C59DD95246C1&Options=&Search=

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New York City, NY – Grant Program

Tribeca Lofts

Private property owners are eligible to apply for funds from the Department of Environment (DEP) for the design and construction of green infrastructure systems, including green roofs.

Policy Details

- Funding is determined based on the proposed coverage area and soil depth
- Projects will undergo design review process and structural analysis

For more information visit https://www1.nyc.gov/html/dep/pdf/green_infrastructure/gi-grant-program-workshop-presentation.pdf

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New York City, NY – Program Details

- Projects must be between 3,500ft² - 20,000ft²
- Projects must be completed within 1 year from construction start date
- Minimum cost of $35,000 – a barrier for smaller projects
- **Reimbursement Rates ($/SF) for Green Roof Projects**

Soil Depth (in) :	Funding/square foot
1.5-1.99	$10
2.0-2.99	$15
3.0-3.99	$25
4.0+	$30

- For projects greater than 20,000ft² the reimbursement rate is 50% of the rate shown above.
- Restrictive Covenant: the project cannot be destroyed, removed or altered without the city's consent; the project must be maintained for 20 years.

For more information visit https://www1.nyc.gov/html/dep/pdf/green_infrastructure/gi-grant-program-workshop-presentation.pdf

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Portland, OR – Eco-Roof Requirement

GRHC lobbied, with GRiT for a mandatory requirement.
As a part of the Central City 2035 Plan, new buildings with a net building area of 20,000ft² or more in specific zones must have an ecoroof now.

Hamilton building – one of the early eco-roofs

Policy Details

- The ecoroof must cover 100% of the roof area, with a few exceptions
- The roof reduces annual runoff volume by 50% (note the performance measure)
- Minimum 4 inches of growing media
- Vegetation must be drought resistant (chosen off of an ecoroof plant list), and achieve 90% coverage within 2 years of planting

*** GRHC will be hosting a Green Roof Symposium in Portland on September 13, 2019. See www.greenroof.org/events

For more information visit http://www.portlandonline.com/shared/cfm/image.cfm?id=53363

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San Francisco, CA – Better Roofs Ordinance

GRHC held *CitiesAlive* in San Francisco in 2013.

Worked with SPUR on policy report recommending mandatory green roofs to City officials.

Better Roofs Ordinance (BRO) passes in 2016 - new buildings are required to have 15% of the roof space as solar or 30% of the roof space as a Living (green) Roof or a combination of both.
Came into effect January 1, 2017.
BRO won a 2018 National Planning Award from APA

The Iconic California Academy of Sciences

<u>Policy Details</u>

- Applies to buildings that: are non-residential buildings that have a gross floor area of 2000ft²/residential buildings of any size, and have 10 or fewer occupied floors
- Growing media should be at least 4 inches deep
- There should be a high diversity of plant species
- Plants should be low-water use and low maintenance

For more information visit
https://sfgov.org/sfplanningarchive/san-francisco-better-roofs

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Toronto, ON – Green Roof By-Law

GHRC founding members built a green roof demonstration project on Toronto City Hall in 2001.
Organized multiple tours/meetings/educational seminars.
Lobbied for green roof requirements.
Ryerson University Cost-Benefit Study in 2007
Green Roof By-Law (Mandatory requirement for new buildings and a construction standard passed council in 2009) – First in NA.
New residential, institutional and commercial buildings; new additions to buildings; and industrial buildings that are 2,000m² or more are required to have green roofs.

Bridgepoint Active Health Centre

<u>Policy Details</u>

- The plant selection and design must cover at least 80% of the green roof within 3 years of planting
- The plants cannot be noxious weeds
- Growing medium must be at least 100 mm (~4 inches)
- There are guidelines for biodiverse green roofs that describe best practices to create habitat and promote biodiversity
- Can buy out for $100 per square meter – money funds Eco-Roof Grant program for existing buildings

For more information visit
https://www.toronto.ca/city-government/planning-development/official-plan-guidelines/green-roofs/green-roof-bylaw/

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Toronto, ON

Green Roof Coverage Requirements

Gross Floor Area	Coverage Requirement
>4,999m²	20%
5,000-9,999m²	30%
10,000-14,999m²	40%
15,000-19,999m²	50%
20,000m²+	60%

Industrial buildings are required to provide a green roof covering 10% of available roof space or 2,000m²; or a cool roof.

** Toronto has an estimated 6-7 million square feet of green roofs built to date.

For more information visit https://www.toronto.ca/services-payments/water-environment/environmental-grants-incentives-2/green-your-roof/

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Toronto, ON

Eco-Roof Incentive

Grants are available to assist in the funding of green roof installation, and the structural assessment of a building to determine if it can carry the weight load of a green roof.

<u>Policy Details</u>

- Funding for the installation of a green roof is $100/m² of green roof
- Up to $1,000 for the structural assessment of an existing building

Toronto City Hall Green Roof

For more information visit https://www.toronto.ca/services-payments/water-environment/environmental-grants-incentives-2/green-your-roof/

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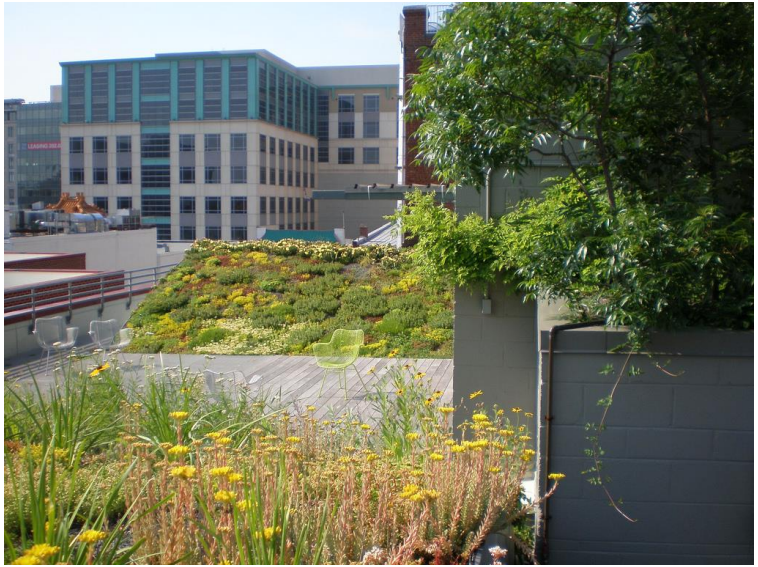
Washington, DC

There are currently over 4 million ft² of green roofs in DC!!

- GRHC has hosted:
  - Cities Alive in Washington DC in 2005 and 2016
  - Four regional events



ASLA Green Roof Demonstration Project

For more information visit https://doee.dc.gov/greenroofs

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Washington, DC Riversmart Rebate

With the Riversmart Green Roof Rebate program, residential, commercial and institutional property owners can receive a rebate for installing a green roof on qualified buildings of any size.

Policy Details

- Within the combined sewer system, the rebate is $10/ft^2; and within the municipal storm sewer system, the rebate is $15/ft^2
- For buildings 2,500ft^2 or less, there is funding for a structural assessment
- Chosen vegetation should cover at least 50% of the green roof after one year and 80% of the green roof after two years for plugs and cuttings; or 90% coverage after one year for sedums
- Installed green roof is eligible for stormwater fee credit, and stormwater retention credit trading program

For more information visit https://doee.dc.gov/greenroofs

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Washington, DC Stormwater Fee Credit

US Tax Court

Property owners can receive discounts on their stormwater fees by reducing stormwater runoff using green infrastructure.

Policy Details

- The RiverSmart Rewards program offers a discount of up to 55% off the stormwater fee
- The Clean Rivers Impervious Area Charge Incentive Program offers a discount off up to 4% off the stormwater fee

For more information visit https://doee.dc.gov/riversmartrewards

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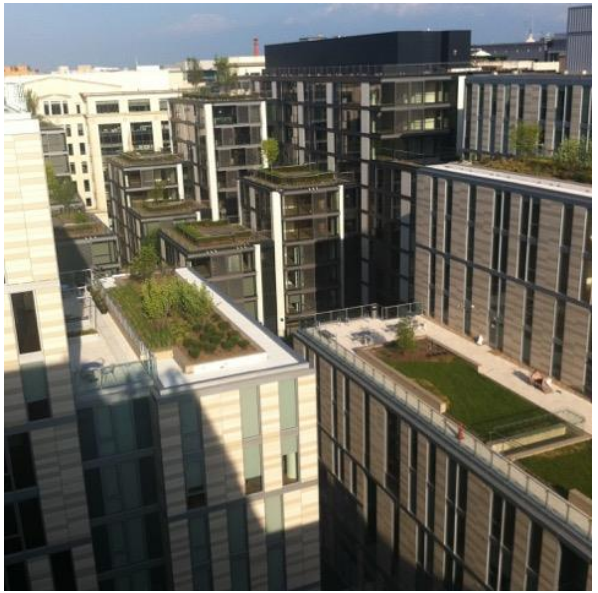
Washington, DC – Green Area Ratio

- The green area ratio is a policy tool first developed in Berlin and now used in Seattle and DC.
- GAR is the ratio of the score of landscape elements to the total land area of the development.
- The score of landscape elements is calculated by multiplying the area of each element (tree, green roof etc) by its multiplier value (varies) and adding the totals together.
- In DC it is a requirement for new buildings that require a Certificate of Occupancy and buildings that are receiving new additions or interior renovations. The required ratio varies base on the zone district.
- Landscape elements include: Soil and amendments, bioretention, new and existing planting, trees, vegetated walls and roofs, and more.

For more information visit
https://doee.dc.gov/sites/default/files/dc/sites/ddoe/publication/attachments/GARPublicPresentation_2018April.pdf



DC City Centre

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Washington, DC Green Area Ratio

Policy Details

- The roof must have a minimum of 5-7 plant species, and no more than 20% of total vegetation roof coverage may be an individual native species.
- Plants should achieve minimum 80% coverage after 2 years
- Minimum 2 succulent plugs/ft² or 10lbs of cuttings/100ft²
- Designs must include supplemental water

For more information visit
https://doee.dc.gov/sites/default/files/dc/sites/ddoe/publication/attachments/GARPublicPresentation_2018April.pdf

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Washington, DC SRC Trading

Stormwater Retention Credit Trading

University of District of Columbia

Property owners can install green infrastructure to reduce stormwater runoff and generate Stormwater Retention Credits (SRC).

Policy Details

- One SRC equals one gallon of stormwater retained in one year
- Purchase price/credit based on location in Municipal Separate Sewer System: Non-tidal - $1.95 and tidal - $1.70
- Credits can be sold to projects that are required to implement stormwater management practices
- Credits can be sold to the Department of Environment and Energy if they drain into District water bodies
- Must pass maintenance inspections

For more information visit https://doee.dc.gov/src

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Living Architecture Performance Tool

- After five years development work - Launched Version 1.0 in 2018
- 110 Points Available Across 8 Different Areas – Water Management, Design, Energy etc…
- Projects that are green roofs and or green walls – completed or in progress can apply for certification.
- The cost is $1500 and up for very large projects.
- Leading companies have signed up to become certified.
- System is similar to USGBC's LEED Program and Sustainable Sites – certified, silver, gold and platinum levels.
- System can be used for incentive programs - $$ per square foot to reach various levels of certification.
- To download the LAPT go to www.greeninfrastructurefoundation.org

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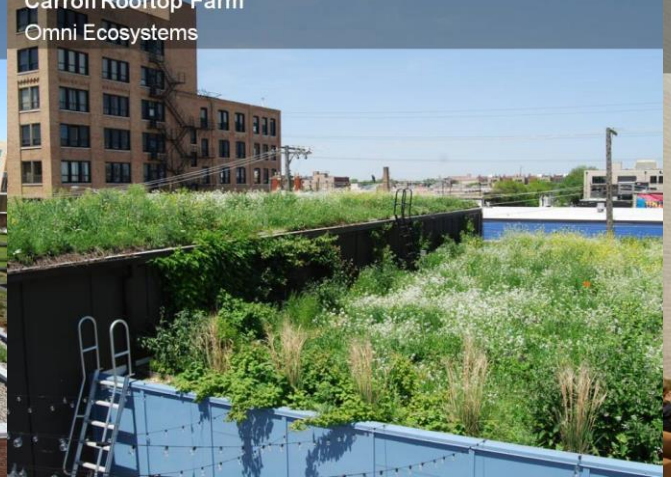
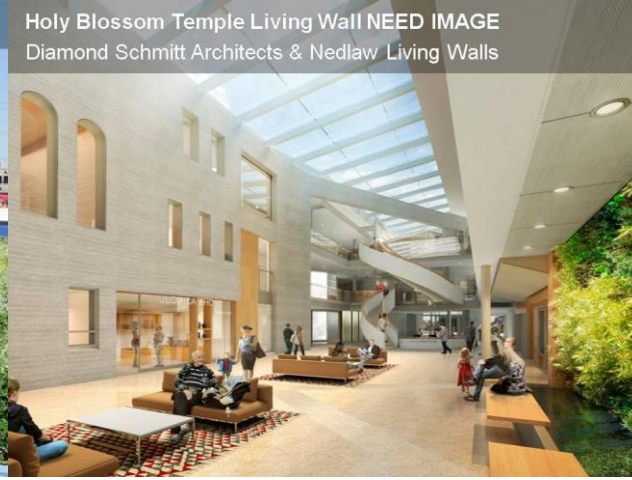


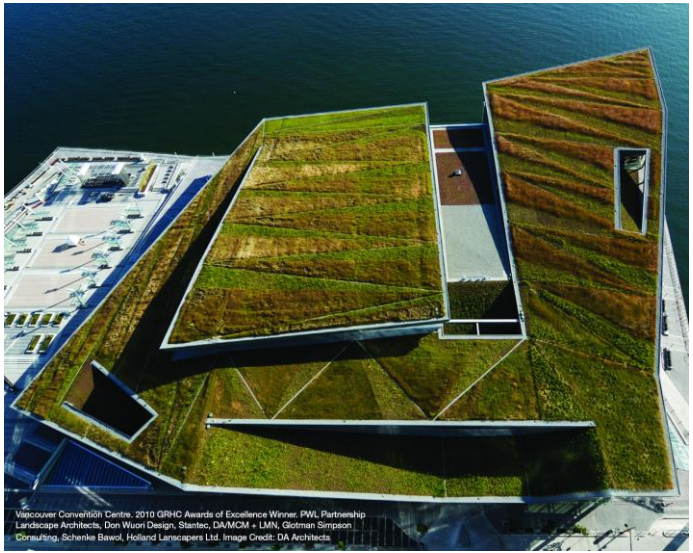


Living Architecture Performance Tool: Advancing Performance & Policy

Current Efforts Vancouver

Vancouver, BC

- Held CitiesAlive in 2010
- Held Symposium in December 2018
- Commitment by the Council in 2018 to make green roofs mandatory
- GRHC sits on Technical Advisory Committee
- GRiT is forming in Vancouver.
- Anticipate policy in Fall/Winter of 2019



Vancouver Convention Center

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Current Efforts Conferences

Grey to Green Conferences

Best practices in policy, technology, design for all forms of green infrastructure
One day intensive event with tours and training on either side
Averages about 200 attendees – trade show and concurrent sessions

September 30 – October 1, 2019 Twin Cities

October 29 – October 30, 2019 Washington, DC

CALL FOR PROPOSALS NOW OPEN!

Visit www.greytogreenconference.org to submit in May

Conclusion & Next Steps

Need to continue to invest time and effort to have green roofs and walls become a mandatory component of new buildings.

We are developing more web based resources for policy makers. Standardize requirements which are over the map. See www.greenroofs.org/policy

We are releasing a detailed report on green roof and wall policies in North America for GRHC Members in June.

The implementation of widespread green roofs and walls is a key strategy for supporting more resilient and healthy cities in the future.

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Questions & Resources?

Training Courses – www.livingarchitectureacademy
Policy Resources – www.greenroofs.org/policy
Call for Papers for Grey to Green Conferences – www.greytogreenconferences.org
Membership information – www.greenroofs.org/membership-overview
Living Architecture Policy Tool – www.greeninfrastructurefoundation.org

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