

APPENDIX: EXAMPLES FROM OTHER CITIES

Reference Cities

1. San Francisco
2. Toronto
3. Chicago
4. Seattle



SAN FRANCISCO

WHAT?

‘Better Roofs’ Ordinance

Green roofs are one compliance option

Provides options for meeting SF Green Building Code

Leverages CA State Law requirement

INTENT

Living roofs and solar energy systems are compatible and complementary, improving the environmental benefits of each.

APPLICABILITY

New Construction $\geq 2,000 \text{ ft}^2$, ≤ 10 occupied floors

DETAILS

15%* - 30% of roof space must be solar, living roofs, or combination

EXEMPTIONS

No cash-in-lieu option

RESOURCES

Living Roof Manual | Interactive Map | Case Studies

IMPACT

Too soon to gauge (enacted January 2017)

TORONTO

WHAT?	<p>‘Green Roof By-Law’</p> <p><i>Green roofs are sole compliance option</i></p> <p>Complements ‘Toronto Green Standard’ tiered performance measures</p>
INTENT	<p>Full spectrum, city-wide environmental benefits</p>
APPLICABILITY	<p>New Construction $\geq 21,500 \text{ ft}^2$ (2,000 m^2)</p> <p>New Additions $> 21,500 \text{ ft}^2$ (2,000 m^2)</p>
DETAILS	<p>Area-based requirement 20% - 60%</p> <p>Cash-in-lieu approx. \$20/ft² (\$200/m²)</p>
EXEMPTIONS	<p>Area discount for solar panels, residential outdoor amenity space, tower roof on buildings $< 8,000 \text{ ft}^2$</p>
RESOURCES	<p>Green Roof Construction Standard: Supplementary Guidelines</p>
IMPACT	<p>100 new green roofs in 2017</p> <p>500 permits since 2010, only 40 cash-in-lieu, no code change request</p>

FULL SPECTRUM ENVIRONMENTAL BENEFITS

CHICAGO

WHAT?	<p>‘Sustainable Development Policy’</p> <p><i>Green roofs are one compliance option</i></p>
INTENT	<p>Address urban temperatures and stormwater issues in creative, performance based ways that are equally effective</p>
APPLICABILITY	<p>New Construction and Major Renovations receiving City funding or special approvals (plan developments)</p>
DETAILS	<p>Incentive-based points system comprising green roofs, green building certifications</p>
EXEMPTIONS	<p>None, offers multiple paths to 100pts</p>
RESOURCES	<p>Handbook Spreadsheet Compliance Form</p>
IMPACT	<p>As of 2013:</p> <p>500 green roofs, 5.6 million ft²</p>

Chicago Sustainable Development Policy 2017.01.12



Compliance Options		Points Required	Sustainable Strategies Menu																																	
Compliance Paths	Starting Points	Number of Optional Points Required New Construction / Substantial Rehab / Moderate Rehab	Health	Energy							Stormwater						Landscapes			Green Roofs		Water		Transportation							Solid Waste	Work Force	Wildlife			
			1.1 Achieve WELL Building Standard	2.1 Designed to earn the Energy Star	2.2 Exceed Energy Code (5%)	2.3 Exceed Energy Code (10%)	2.4 Exceed Energy Code (25%)	2.5 Exceed Energy Code (40%)	2.6 Onsite Renewable Energy (3%)	2.7 Onsite Renewable Energy (5%)	3.1 Exceed Stormwater Ordinance by 25%	3.2 Exceed Stormwater Ordinance by 50%	3.3 100% Stormwater Infiltration	3.4 Sump Pump Capture & Reuse	3.5 100-year detention for lot-to-lot buildings	3.6 100-year Detention for Bypass	4.1 Working Landscapes	4.2 Natural Landscapes	4.3 Tree Planting	4.4 Achieve Sustainable Sites Certification	5.1 Green Roof 50-100%	5.2 Green Roof 100%	6.1 Indoor Water Use Reduction (25%)	6.2 Indoor Water Use Reduction (40%)	7.1 Proximity to Transit Service	7.2 Bikeshare Sponsorship	7.3 Bike Parking Residential	7.4 Bike Parking Commercial & Industrial	7.5 EV Charging Stations	7.6 EV Charger Readiness	7.7 CTA Digital Displays	8.1 80% Waste Diversion	8.2 Workforce Development	9.1 Bird Protection (Basic)	9.2 Bird Protection (Enhanced)	
Options Without Certification																																				
All Options Available	0	100 / 50 / 25	40	30	20	30	40	50	10	20	10	20	40	5	5	5	5	5	5	20	10	20	10	20	5	5	5	5	10	5	5	10	10	5	10	
Options With Certification																																				
LEED Platinum	95	5 / 0 / 0	40	NA	NA	NA	NA	NA	NA	NA	10	20	40	5	5	5	NA	NA	NA	20	10	20	NA	NA	NA	5	NA	NA	NA	5	5	NA	10	5	10	
LEED Gold	90	10 / 0 / 0	40	NA	NA	NA	NA	50	10	20	10	20	40	5	5	5	5	NA	5	20	10	20	NA	NA	NA	5	NA	NA	10	5	5	10	10	5	10	
LEED Silver	80	20 / 0 / 0	40	NA	NA	NA	NA	40	50	10	20	10	20	40	5	5	5	5	5	20	10	20	NA	20	NA	5	NA	NA	10	5	5	10	10	5	10	
Green Globes 4-Globes	90	10 / 0 / 0	40	NA	NA	NA	NA	NA	50	10	20	10	20	40	5	5	5	NA	5	20	10	20	NA	NA	NA	5	NA	NA	10	5	5	10	10	5	10	
Green Globes 3-Globes	80	20 / 0 / 0	40	NA	NA	NA	NA	40	50	10	20	10	20	40	5	5	5	5	NA	5	20	10	20	NA	NA	NA	5	NA	NA	10	5	5	10	10	5	10
Green Globes 2-Globes	70	30 / 0 / 0	40	NA	NA	NA	NA	40	50	10	20	10	20	40	5	5	5	5	5	20	10	20	NA	20	NA	5	NA	NA	10	5	5	10	10	5	10	
Living Building Challenge	100	0 / 0 / 0	40	NA	NA	NA	NA	NA	NA	NA	10	20	40	5	5	5	NA	NA	NA	20	NA	NA	NA	NA	NA	NA	NA	10	5	NA	NA	10	5	10		
Living Building Challenge Petal	90	10 / 0 / 0	40	NA	20	30	40	50	NA	NA	10	20	40	5	5	5	5	NA	5	20	10	20	10	20	NA	5	NA	NA	10	5	5	10	10	5	10	
Enterprise Green Communities*	80	20 / 0 / 0	40	NA	NA	NA	NA	NA	10	20	10	20	40	5	5	5	5	5	5	20	10	20	10	20	5	5	NA	NA	10	5	5	10	10	5	10	
PassiveHouse	70	30 / 0 / 0	40	NA	NA	NA	NA	NA	10	20	10	20	40	5	5	5	5	5	5	20	10	20	10	20	5	5	5	5	10	5	5	10	10	5	10	

*only available to affordable housing projects funded by DPD's Housing Bureau

SEATTLE

WHAT?	<p>‘Green Factor’ Regulations and Stormwater Mitigation</p> <p><i>Green roofs are one compliance option</i> in broader Green Building Standard program of incentives</p>
INTENT	Increase the amount and quality of landscaping in new developments
APPLICABILITY	New Construction
DETAILS	<p>Points system weighted by building zone</p> <p>Combination of green roofs, rain gardens, vegetated walls, trees, shrubs.</p> <p>Bonus credit for planting along the sidewalk, native plants, food gardens</p>
EXEMPTIONS	Single-family zones, some Industrial and Downtown zones
RESOURCES	Scoresheet Landscape Standards Tree & Plant List
IMPACT	Raised the bar for quality landscaping in streetscapes and use of landscape technologies

Green Factor Score Sheet

Project title:

enter sq ft
of parcel

Parcel size (enter this value first) *

5,000

SCORE

-

Landscape Elements**

Totals from GF worksheet

Factor

Total

A Landscaped areas (select one of the following for each area)

1 Landscaped areas with a soil depth of less than 24"

enter sq ft
0

0.1

-

2 Landscaped areas with a soil depth of 24" or greater

enter sq ft
0

0.6

-

3 Bioretention facilities

enter sq ft
0

1.0

-

B Plantings (credit for plants in landscaped areas from Section A)

1 Mulch, ground covers, or other plants less than 2' tall at maturity

enter sq ft
0

0.1

-

2 Shrubs or perennials 2'+ at maturity - calculated at 12 sq ft per plant (typically planted no closer than 18" on center)

enter number of plants
0

0

0.3

-

3 Tree canopy for "small trees" or equivalent (canopy spread 8' to 15') - calculated at 75 sq ft per tree

enter number of plants
0

0

0.3

-

4 Tree canopy for "small/medium trees" or equivalent (canopy spread 16' to 20') - calculated at 150 sq ft per tree

enter number of plants
0

0

0.3

-

5 Tree canopy for "medium/large trees" or equivalent (canopy spread of 21' to 25') - calculated at 250 sq ft per tree

enter number of plants
0

0

0.4

-

6 Tree canopy for "large trees" or equivalent (canopy spread of 26' to 30') - calculated at 350 sq ft per tree

enter number of plants
0

0

0.4

-

7 Tree canopy for preservation of large existing trees with trunks 6"+ in diameter - calculated at 20 sq ft per inch diameter

enter inches DBH
0

0

0.8

-

C Green roofs

1 Over at least 2" and less than 4" of growth medium

enter sq ft
0

0.4

-

2 Over at least 4" of growth medium

enter sq ft
0

0.7

-

D Vegetated walls

enter sq ft
0

0.7

-

E Approved water features

enter sq ft
0

0.7

-

F Permeable paving

1 Permeable paving over at least 6" and less than 24" of soil or gravel

enter sq ft
0

0.2

-

2 Permeable paving over at least 24" of soil or gravel

enter sq ft
0

0.5

-

G Structural soil systems

enter sq ft
0

0.2

-

sub-total of sq ft = 0

H Bonuses

1 Drought-tolerant or native plant species

enter sq ft
0

0.1

-

2 Landscaped areas where at least 50% of annual irrigation needs are met through the use of harvested rainwater

enter sq ft
0

0.2

-

3 Landscaping visible to passersby from adjacent public right of way or public open spaces

enter sq ft
0

0.1

-

4 Landscaping in food cultivation

enter sq ft
0

0.1

-

Green Factor numerator =

-

CONCLUSION

In most cities, green roofs are just one path to meet the overall environmental benefit

No other cities include existing buildings

All cities engaged in lengthy outreach process

Policy context and sustainability goals must be a key driver



New Construction Policies with Similar Benefits

New Construction Requirements:

- Green Roofs
- Solar Panels
- Cool roofs
- Green Amenity Spaces
- Stormwater Management e.g. street gardens planters
- Net Zero Energy Building
- Green Building Certifications

Existing Building Policies with Similar Benefits

Existing Building Requirements:

- Retro-Commissioning
- Energy Audits
- Lighting Upgrades
- Cool roofs