

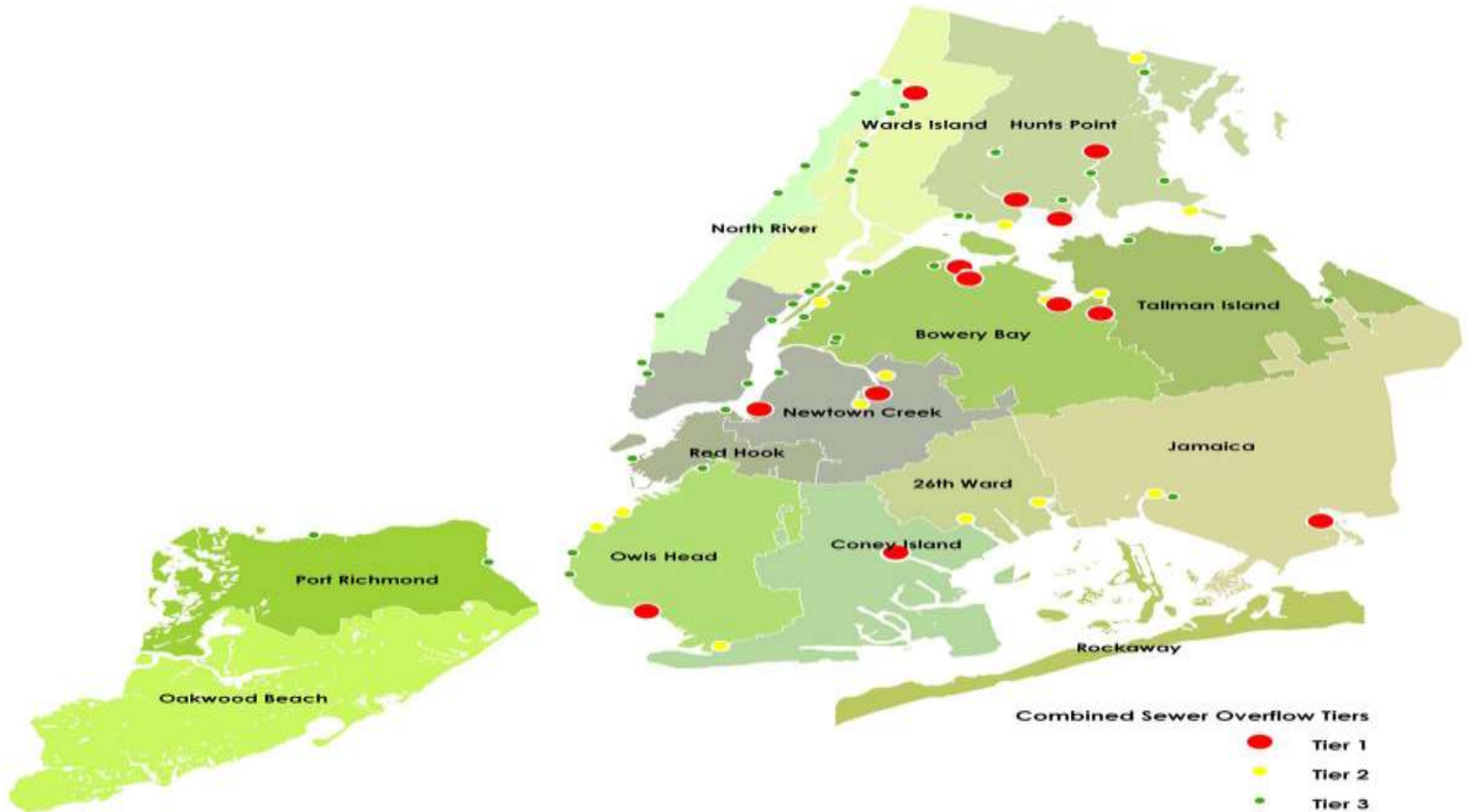
GREEN ROOFS

NEW YORK PREDEVELOPMENT





New York City CSO's



GREEN INFRASTRUCTURE/LID



an approach to land development (or re-development) that works with nature to manage stormwater as close to its source as possible

LID (Low Impact Development)

LID is an approach to land development (or re-development) that works with nature to manage stormwater as close to its source as possible

LID Techniques

Bioretention

Green Roofs

Permeable Pavers

Rain Barrels and Cisterns

Soil Amendments

Tree Box Filters

LID Techniques (BMP'S)

BMP's

Best Management Practices:

Techniques used to control stormwater runoff, sediment control, and soil stabilization, as well as management decisions to prevent or reduce nonpoint source pollution



EXAMPLES

Habitat Corridor--In most urban areas, the wildlife habitat that does exist is rarely connected and therefore creates a dangerous environment for there are no opportunities for safe migration and little, if any biodiversity which is essential in creating any sustainable habitat.

EXAMPLES



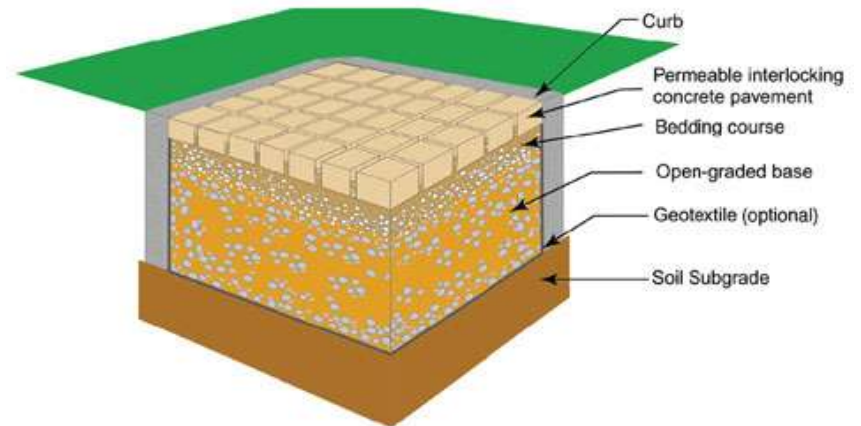
Wildlife Habitat Corridor Installation, Harlem River yard

Permeable Paving

Pervious concrete



Interlocking concrete pavement



A range of materials and techniques for paving [roads](#), [parking lots](#) and [walkways](#) that allow the movement of water and air around the paving material.

RAIN WATER HARVESTING

RAIN BARRELS



RAINWATER HARVESTING



SOIL AMMENDMENTS

Compost



Mulch



LID BENEFITS:

- enhances the local environment
- protects public health
- improve community livability
- save developers and local governments money.
- LID offers a more environmentally sound passive technology for addressing the impacts of urbanization.

WHAT IS A GREENROOF?



A Greenroof is a system of plants growing in an engineered substrate, over 1 or more protective layers, installed on a new or existing roof.

A green roof can cover available roof surface area entirely or partially.

HISTORY



Babylonian Hanging Gardens



Nancy Marie Brown

Sod Roofs are a centuries old tradition

Green Roof

HISTORY

Modern Greenroof Technology was incubated and developed in Germany, since at least the early sixties.



Green Roof

HISTORY

Today Greenroofs sit atop approximately 10% of flat roof surfaces in Germany.

Over 140 million square feet of roof surface is covered by greenroof systems .

Greenroofing industry is a business sector that generates millions in profits.

Over 7% of all new German construction implement greenroof systems.

HISTORY

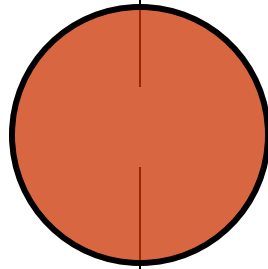
The growth of the green roof industry in North America has increased steadily and substantially in recent years.

Completed green roof projects in 2008 indicate a U.S. growth rate of more than 35 percent over 2007, representing more than 3.1 million square feet installed in 2008.

GREEN ROOF BENEFITS

New Construction

Retrofit



Controls stormwater

Increases regional **water quality**

Mitigates Urban Heat Island

Decreases air temperature within the roofs immediate area

Insulates building and **Protects** roof materials and deck

Reduces sound reflection and trasmission

Promotes community and neighborhood connections

AND

Creates wildlife habitat

HOW DO GREENROOFS WORK?



HOW DO GREENROOFS WORK?

TYPES of GREENROOFS: Extensive VS. Intensive

Extensive GreenRoof systems

Growing media depth 4-6 inches or less

Less resource intensive/low maintenance needs

Non-recreational/inaccessible

Less expensive installation costs

Can be retrofitted to existing building more easily

Full saturation weight: 10-35 lb/sq ft

Lower plant species diversity

Intensive GreenRoof Systems

Growing Media depth 6 inches or more

More resource intensive/requires irrigation

Recreational uses/accessible to traffic

Higher installation costs

Requires higher weight load tolerances

Saturation weight 50-300 lbs

Supports higher plant diversity

EXTENSIVE ROOF



Vegetated Cover / Eco-Roof

System that is typically 4"-6" in height or less

Chosen typically because system is low maintenance, lightweight, and affordable

Non-recreational, but environmentally functional

INTENSIVE ROOF



Growing media depth 6" or deeper

Wide array of planting options

Heavier System

Can be high maintenance

Can be used recreationally



MODULAR SYSTEMS



Can be intensive or Extensive

Convey instant benefits

Ease troubleshooting

More expensive



VEGETATED MATS



Flexibility in applications: Slope, or flat

Less expensive than modules

Conveys immediate benefits



GREENROOF SYNERGIES



“Blue Roof” and or rain harvesting systems

Increase the efficiency of Solar Panels

Water can be used in greywater and/or irrigation







GREENROOF SYNERGIES



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GREENROOF SYNERGIES



Urban Agriculture applications:

Vertical farming

Rooftop Agriculture

Enormous undiscovered potential for regional food production

GREENROOF SYNERGIES



Urban Agriculture applications:

Micro Livestock

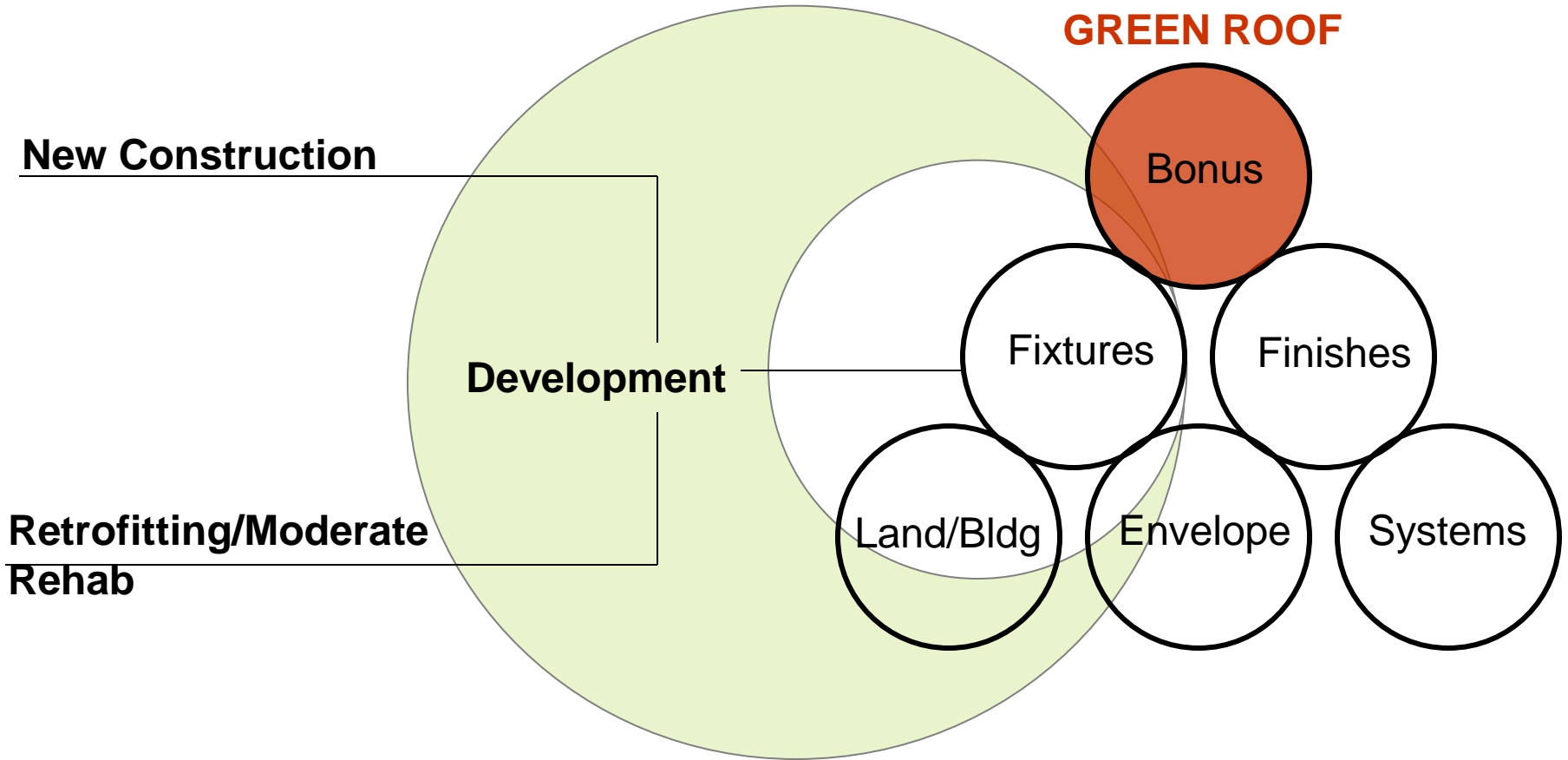
Hydroponics

Aquaculture

Aquaponics



AN INTEGRATED APPROACH ENHANCES BUILDING PERFORMANCE AND EFFICIENCY



HOW TO BEGIN:

How do I get a greenroof ??

A typical installation project may require the services of different professionals depending on the scale:

-Structural Engineer

-Architect

-Landscape Architect

-LIC Roofing Professional

-Greenroof Installer or Landscaping Company

-Insurance Company (homeowner's insurance representative or Business)

-Various other Trades as needed

1. Identify needs and/or goals environmental retro fit vs. aesthetic appeal/recreational use

Scale: Residential or commercial? May require a Project manager at the larger scale vs. small installation company for a residential installation

2. Identify permitting obstacles/compliances

With a few exceptions in New York City, extensive greenroofs do not require permits for installation. Except in areas designated as Landmark districts. Intensive installations that may require changes to building infrastructure may require permitting.

3. Identify the services you will need.

Smaller greenroof companies may not provide the services of a Structural engineer which may reduce costs somewhat, but increase the number of steps coordinating an installation

HOW TO BEGIN:

Property Tax Abatement Check list

Information You Need to Know!



Michael R. Bloomberg, Mayor
Robert D. LiMandri, Commissioner
May 2009

Property Tax Abatement for Green Roofs and Solar Electric Generating Systems

To support recent New York State laws providing property tax abatements for [green roof](#) and [solar electric systems](#), the Buildings Department has created new rules for tax abatement application approvals.

Property Tax Abatement Eligibility Requirements:

- o The building must be a Real Property Class 1, 2 or 4.
- o Construction of any green roof requirements must have begun on or after August 5, 2008.
- o Solar electric generating system costs must: 1) be incurred on or after August 5, 2008; and 2) have been incurred in connection with a solar electric generating system placed in service on or after August 5, 2008.

Two New Forms: PTA3 and PTA4

For green roof installations, use the new PTA3 property tax abatement application and agreement application. For solar electric generating system installations, use the new PTA4 property tax abatement application and agreement application. The PTA3/PTA4 must be:

- o Signed and sealed by a licensed architect or engineer
- o Signed by the property tax abatement applicant
- o Submitted with the request for construction application sign-off
- o Accompanied by all required sign-off documents

Property Tax Abatement Filing Requirements

The applicant of record must:

- o Professionally certify an Alteration Type 2 (ALT2) application and agree to have the final inspection performed by a licensed professional on behalf of the Department.
- o Indicate on the Professional Certification (PC1) that the alteration application will be the subject of a green roof or solar property tax abatement application.

Note: Only include work related to the property tax abatement in the alteration application.

ALT2 Application Required Documents

The following documents must be filed when filing an Alt 2 application:

- o Plans demonstrating that all requirements are met, and design and construction drawings
- o Zoning diagram showing compliance with height and setback regulations
- o All required Technical Reports
- o A maintenance plan to maintain the green roof during the compliance period and at least three (3) years thereafter

(Continued)

safety

service

integrity

HOW TO BEGIN:

INCENTIVES/POLICY

New York, New York

Name of Policy: Green Building Tax Credit Program (Corporate)

Provider: New York Department of Environmental Conservation

Type of Policy: Tax Credit

Details:

Contact: Public Information Officer: 518-402-9469 [begin_of_the_skype_highlighting](#) 518-402-9469 [end_of_the_skype_highlighting](#) or depprmt@gw.dec.state.ny.us T

Website/Further Information: www.dec.ny.gov/energy/1540.html

Bronx, New York

Name of Policy: Bronx Environmental Grant Program

Provider: Bronx Initiative for Energy and the Environment

Type of Policy: Grant Program

Details: \$1.15M available for grants to implement energy efficiency technologies, including green roofs, that improve the air quality of the borough.

Contact: Kate Shackford: 718.590.3498 [begin_of_the_skype_highlighting](#) 718.590.3498 [end_of_the_skype_highlighting](#) or kshackford@doedc.org This e-mail address is being protected from spambots. You need JavaScript enabled to view it

Website/Further Information: <http://www.boedc.com/environment/>

Bronx, New York

Name of Policy: Bronx Environmental Revolving Loan Fund

Provider: Bronx Initiative for Energy and the Environment

Type of Policy: Loan Program

Contact: Kate Shackford: 718.590.3498 [begin_of_the_skype_highlighting](#) 718.590.3498 [end_of_the_skype_highlighting](#) or kshackford@doedc.org

Website/Further Information: <http://www.boedc.com/environment/>

New York, New York

Name of Policy: New York City Green Roof Tax Credit State Bill (A.11226)

Provider: NYC Department of Buildings and Office of Long-Term Planning and Sustainability

Type of Policy: Tax Credit

Contact: greenroofandsolar@buildings.nyc.gov This e-mail address is being protected from spambots. You need JavaScript enabled to view it

Website/Further Information: www.nyc.gov/html/dob/html/sustainability/green_roof_faq.shtml

Deadline:

HOW TO BEGIN:

INCENTIVES

Insurance Policies: At present, only a few major insurance U.S. companies are addressing greenroofs:

Affiliated FM

Fireman's Fund Insurance Company

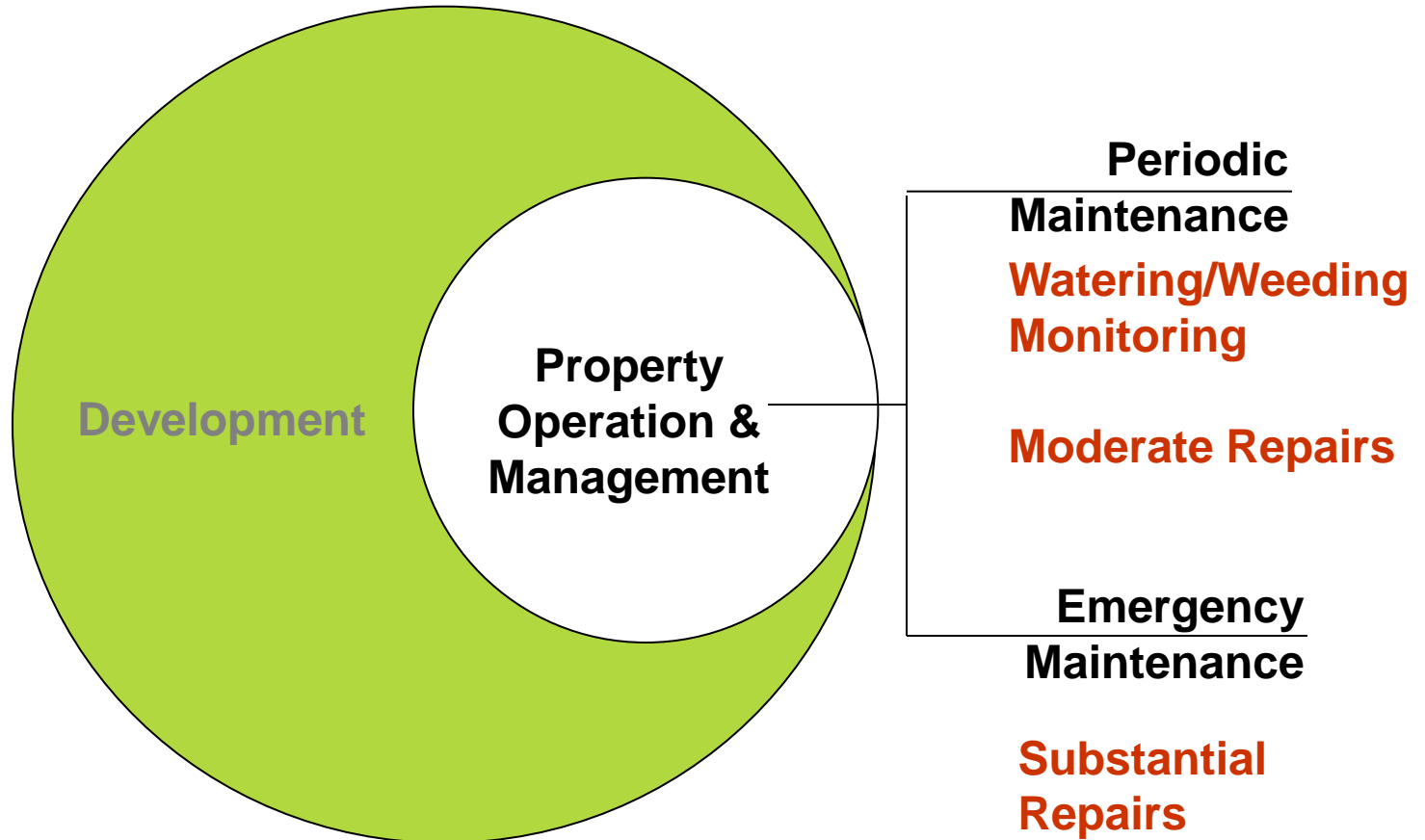
Travelers Insurance:



NYC GREEN INFRASTRUCTURE PLAN



ROOF MAINTENANCE









Green Roof 101













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Green Roof 101



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