



Green Stormwater Infrastructure

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Green Infrastructure

- ▶ Describes products, technologies, and practices that use natural systems – or engineered systems that mimic natural processes – to enhance overall environmental quality and provide utility services (EPA, Green Infrastructure Policies and Resolutions)



Green Roofs >>

City Hall Chicago

Image Courtesy of the City of Chicago

Green Roofs



- ▶ Contained green space above a human made structure (Green Roofs for Healthy Cities)
- ▶ Three types
 - Extensive
 - Semi-Intensive
 - Intensive



Millennium Park in Chicago

Image Courtesy of Green Roofs for Healthy Cities



Permeable Pavement and Porous Concrete >>

Example of Porous Pavers used on a residential project

Examples of Permeable Pavement

- ▶ Illinois Urban Manual outlines design considerations



Image Courtesy of the
City of Chicago Department of
Transportation



Image Courtesy of the
Conservation Design Forum and the NRCS
Illinois Urban Manual



Rain Garden >>

Fox River Country Day School

Image Courtesy of Illinois Rain Garden Initiative



Rain Barrels >>

Image Courtesy of the Office of the Governor Quinn

Common Questions

- ▶ How can we accurately quantify the reduction in stormwater volume?
- ▶ How are stormwater volume reduction credits given?
- ▶ Who will be responsible for future maintenance of the green infrastructure?

Areas of General Agreement

- ▶ NRCS Curve Number Method is probably the best procedure to quantifying volume reduction
- ▶ Procedure need to factor in long term void space reduction and/or surface sealing
- ▶ The range of storage provided in Green Infrastructure is 0.5 to 1.0 inch

Recent Examples Outside of Northeastern Illinois

- ▶ City of Indianapolis
- ▶ City of Philadelphia
- ▶ Indiana Local Technology and Assistance
Program Stormwater Drainage Manual

Indianapolis



- ▶ Green Infrastructure Supplemental Document (In Draft)
 - Design details on 12 different green stormwater and infrastructure practices
 - Specific Design Examples
 - Operation and Maintenance Manuals for each of the 12 practices

- ▶ Developing city-wide standards for calculating water quantity and quality reductions



Philadelphia



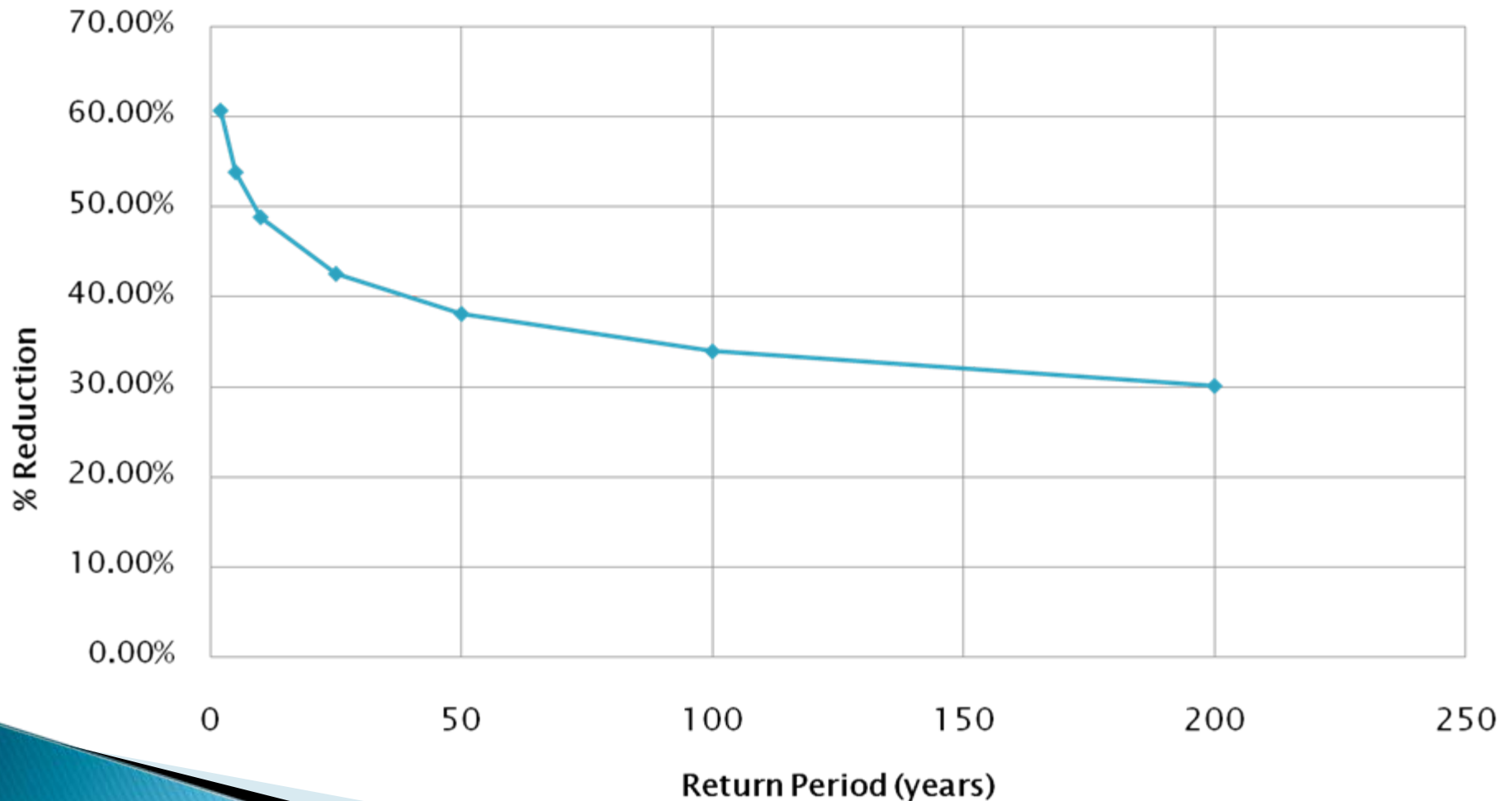
- ▶ New Stormwater Regulations
 - Infiltrate first 1" of rainfall
 - Detain 1 year 24 hr for 24 hrs
- ▶ Any earth disturbance over 15,000 sq feet
- ▶ Parcel based billing to encourage properties to incorporate green practices
- ▶ Estimate that Green Infrastructure regulations will reduce the volume of urban runoff by 908 MG per year

Indiana LTAP Manual

- ▶ Provides design details and methods to determine stormwater volume reduction for the following green infrastructure practices:
 - Green Roofs
 - Permeable Pavement
 - Infiltration Basins
 - Rain Barrels

Green Roofs

Runoff Reduction versus Return Period



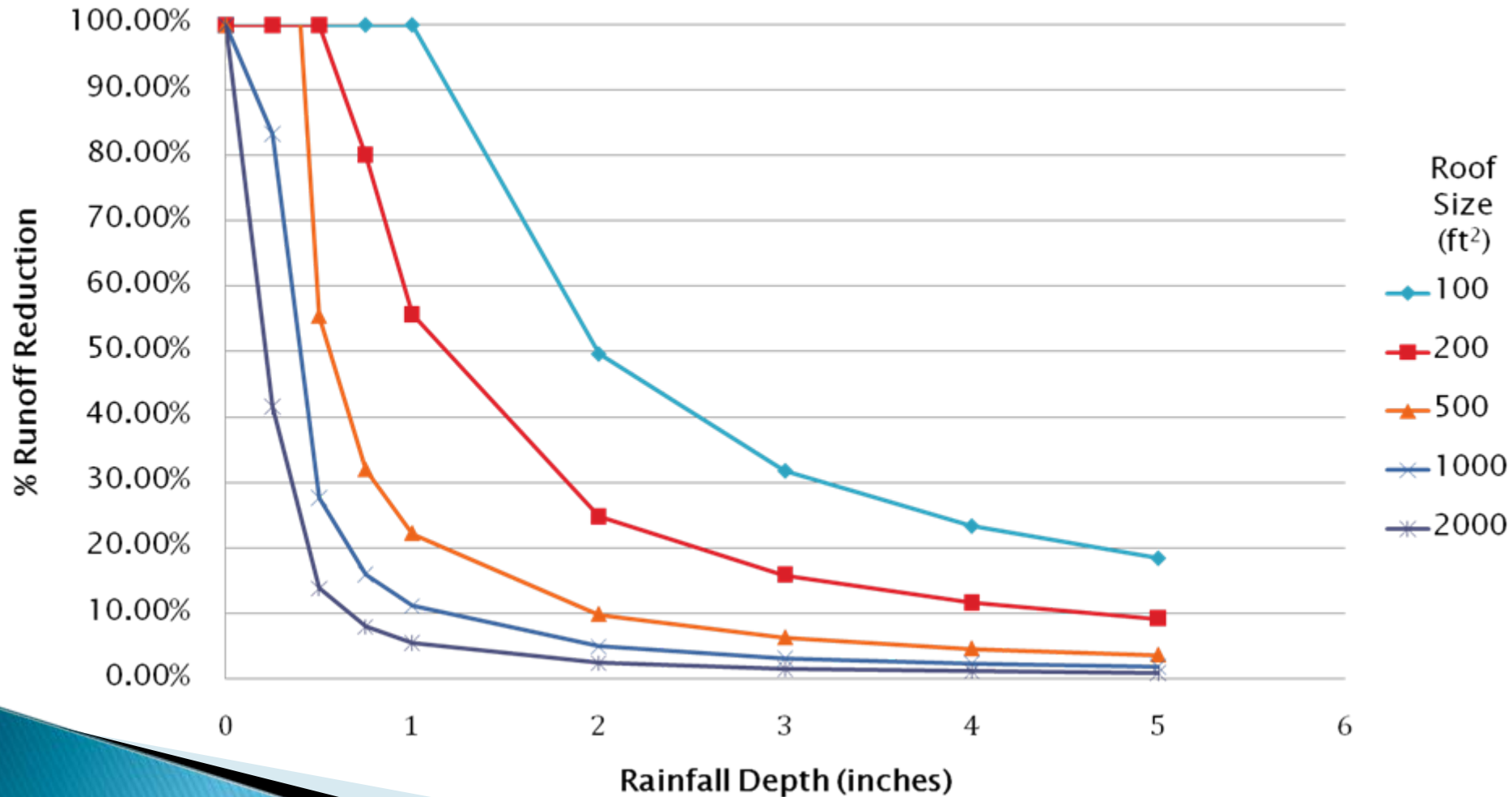
Rain Barrels

- ▶ Average single family home is approximately 2300 square feet
- ▶ Runoff from a 1" rainfall is approximately 150 cubic feet
- ▶ Need around 20 empty 55 gallon rain barrels



Rain Barrels

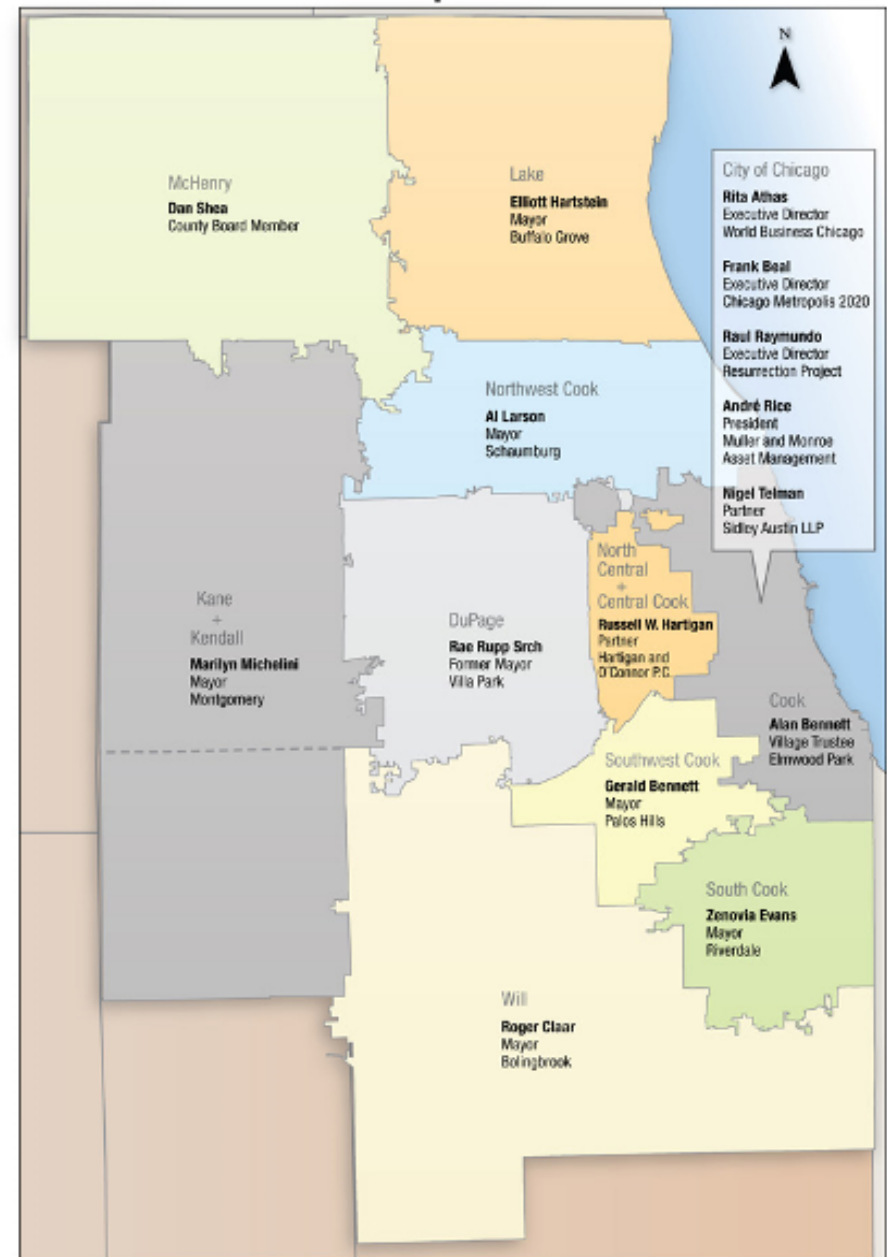
Runoff Reduction from Roofs with 1 Rain Barrel



CMAP

- Established in 2005 by the State of Illinois with support from the region's mayors
- Central purpose is to better integrate planning for land use and transportation
- Merged the Northeastern Illinois Planning Commission (NIPC) and Chicago Area Transportation Study (CATS)

CMAP Board Composition



Not just growth, but *progress*

The Chicago metropolitan area must plan proactively to:

- ▶ House 2.8 million more people by 2040
- ▶ Wise transportation investments minimize congestion
- ▶ Plan for potential water shortages
- ▶ Protect air quality
- ▶ Avoid premature consumption of land
- ▶ Protect important open space and natural resources
- ▶ Aggressively shape a sustainable future rather than react to ongoing development trends

GO TO 2040 Purpose and Process

Long-range plan covering key regional issues:

Economic development

Human and community development

Environment

Land use

Housing

Transportation

When completed in 2010, the *GO TO 2040* plan will recommend action in each of these fields



So what are the scenarios?

- ▶ Still in process of completely defining them
- ▶ Currently:
 1. Reference (continue current trends)
 2. Preservation
 3. Reinvestment
 4. Innovation
- ▶ Complete set of scenarios by summer 2009 and begin public involvement

Scenarios Vary By “Theme”

Scenario 1 (Preservation)	Scenario 2 (Reinvestment)	Scenario 3 (Innovation)
<ul style="list-style-type: none">– Strategy 1– Strategy 2– Strategy 3– Strategy 4	<ul style="list-style-type: none">– Strategy 5– Strategy 6– Strategy 7– Strategy 8	<ul style="list-style-type: none">– Strategy 9– Strategy 10– Strategy 11– Strategy 12

Stormwater Management

- ▶ Impervious Surface Limitation
- ▶ Green Stormwater Infrastructure
 - Permeable Pavements and Surfaces
 - Green Roofs
 - Rain Barrels
 - Rain Gardens
- ▶ Volume Control Regulations
- ▶ Stormwater Utility Fees
- ▶ <http://www.goto2040.org/>



Questions?

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