

SMART STORMWATER ROOFING CONTROLS - THE HIGHEST VALUE METHOD TO MANAGE STORMWATER

StormCon

SEPTEMBER 27, 2022




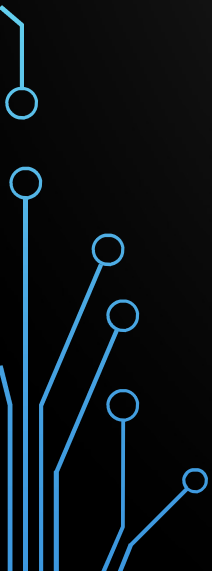

The slide features a dark gray background with decorative light blue circuit-like lines in the corners. These lines consist of straight segments and small circles, resembling a stylized electronic circuit board.

PRESENTERS

- Anthony Mayer, LEED AP, GRP
 - Sustainability
- Christopher Foley, PhD, PE, FASCE
 - P4 Infrastructure
- Matthew Knause, CSI, CDT
 - Abben & Associates



AGENDA

- Quick History
 - Evolving stormwater management regulations are increasing construction costs
 - The Blu-Smart Solution
 - Barriers that Blu-Smart has overcome
 - Blu-Financial Benefits
 - Blu-Smart Review
 - Q&A
- 
- 
- 



ONLY 100 YEARS AGO, THIS WAS A COMMON METHOD OF AIR CONDITIONING

- Manufacturing temperatures of 120 degrees
- Irrigated Roofs
- USING PRECIPITATION TO MITIGATE THE NEED OF FRESH WATER, e.g. The Hanging Gardens of Babylon

QUININE KILLS MALARIA GERMS



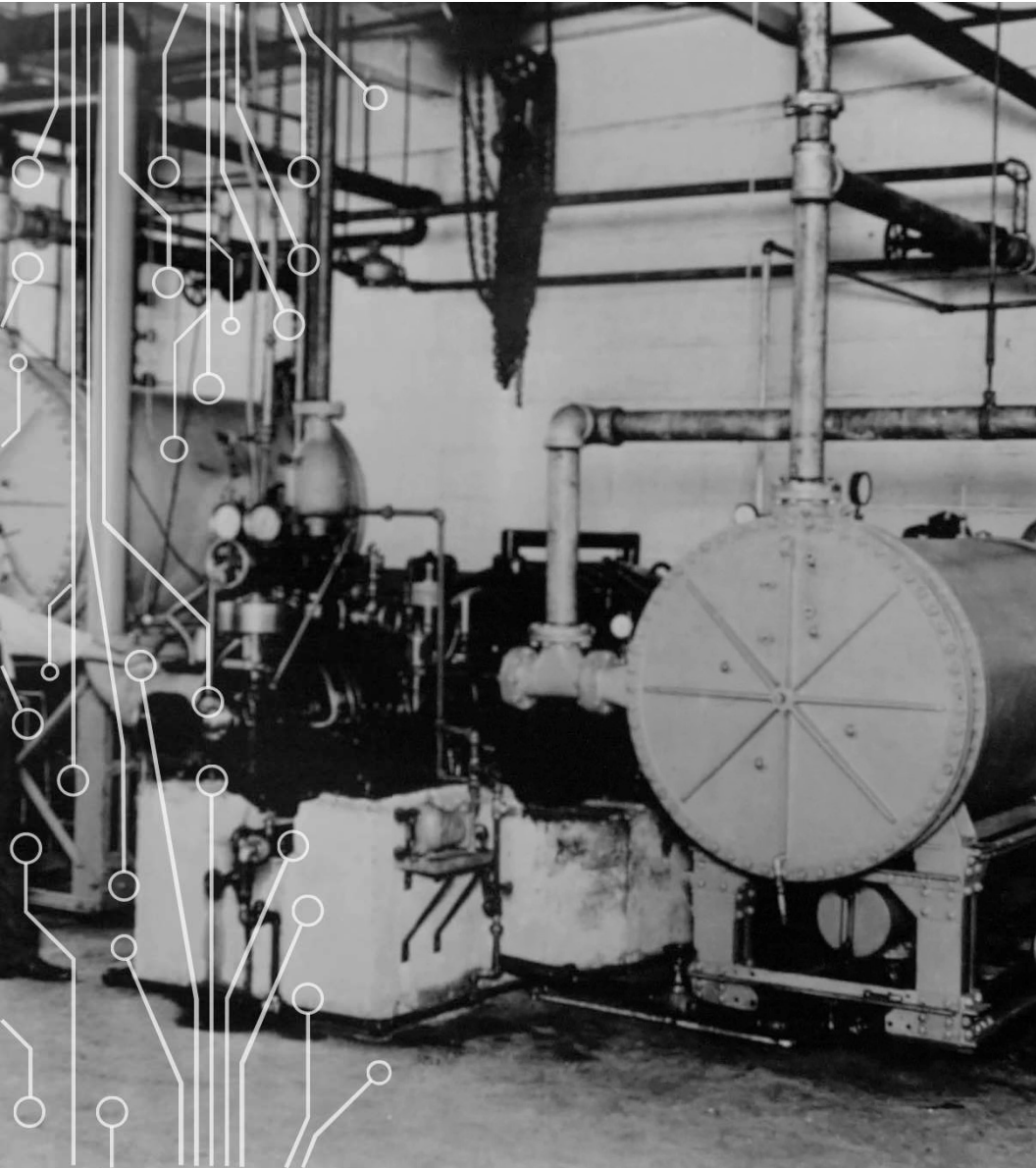
**DAILY DOSES DURING THE
MALARIA SEASON HELP
KEEP MALARIA AWAY**

ASK THE DOCTOR - HE KNOWS

**SEND FOR THE MALARIA PRIMER
PUBLISHED BY THE
UNITED STATES PUBLIC HEALTH SERVICE
WASHINGTON, D.C.**

THEN SCIENTISTS FIGURED OUT MALARIA
WAS THE RESULT OF “STAGNANT”
WATER

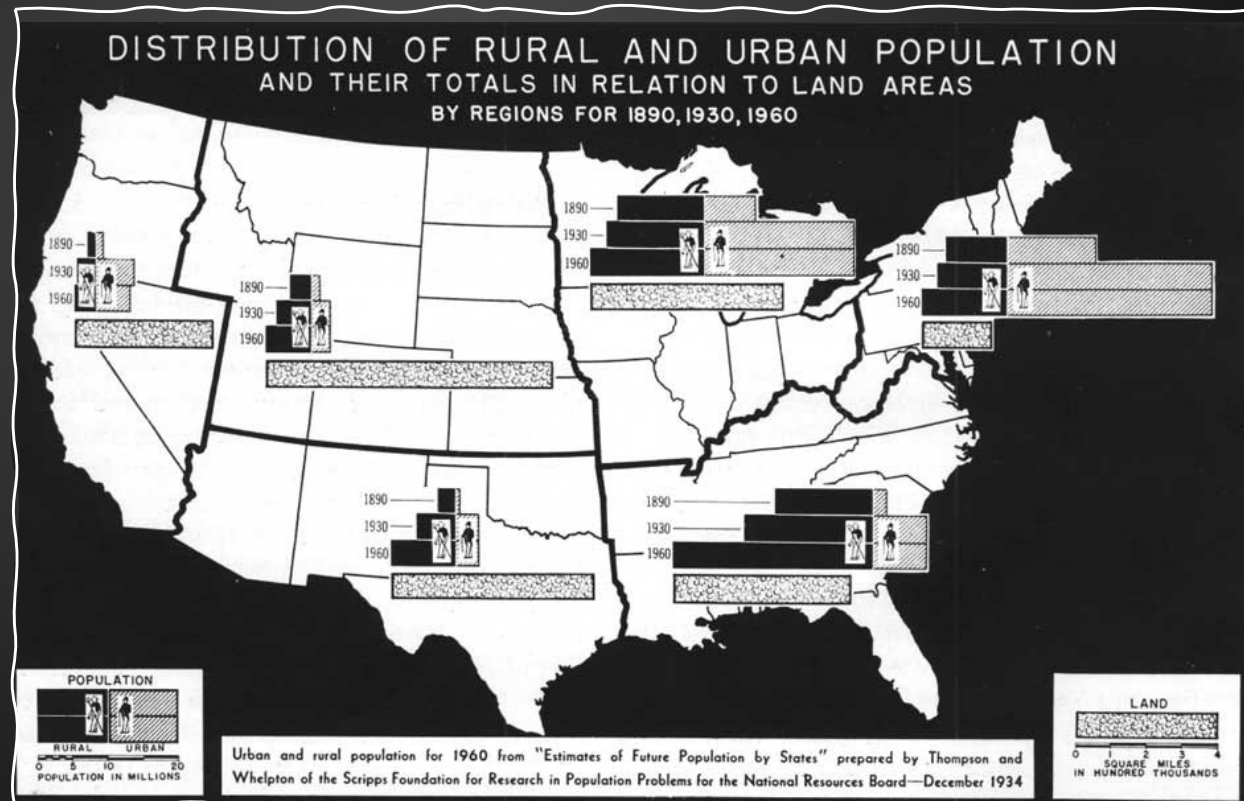
- Exacerbated mosquito population blooms
- Laws were put in place to prevent stagnant water
- ALTHOUGH QUININE IS STILL PROVIDED FOR MALARIA, THE BEST SOLUTION IS TO KEEP THE MOSQUITO POPULATION AS LOW AS POSSIBLE



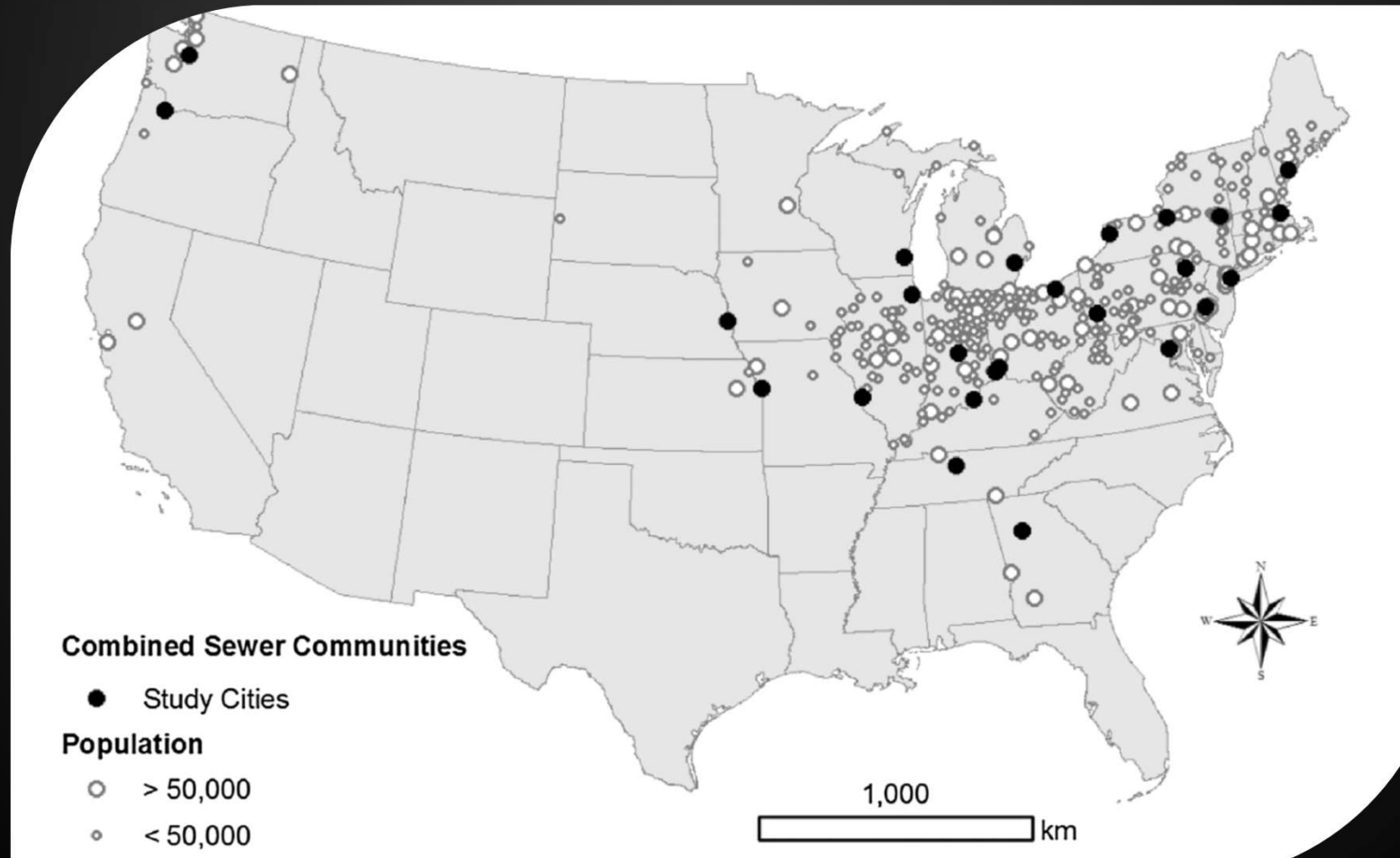
COOLING OF BUILDINGS HAS A NEW SOLUTION IN AIR CONDITIONING

- Negated the need for irrigated roofs
- Help to enact and support stagnant water codes
- BECAME THE SOLUTION THAT MET ALL NEEDS

Yet much has
changed in
100 years



- % of people in the USA living in Urban Areas has increased from 45% to 85%
- Clean Water Act and subsequent codes and laws require commercial property owners to manage stormwater on site
- Urban Land costs are exponentially increasing



CITIES AFFECTED BY VOLUME STORMWATER REGULATIONS



ENTER THE BLU-SMART SOLUTION - POWERED BY P4

- Simple product
- Requires minimal labor for installation of the system
- Logistically friendly in comparison to other methods; requiring minimal shipping or crane time.
- Real time monitoring (maintenance reasoning)

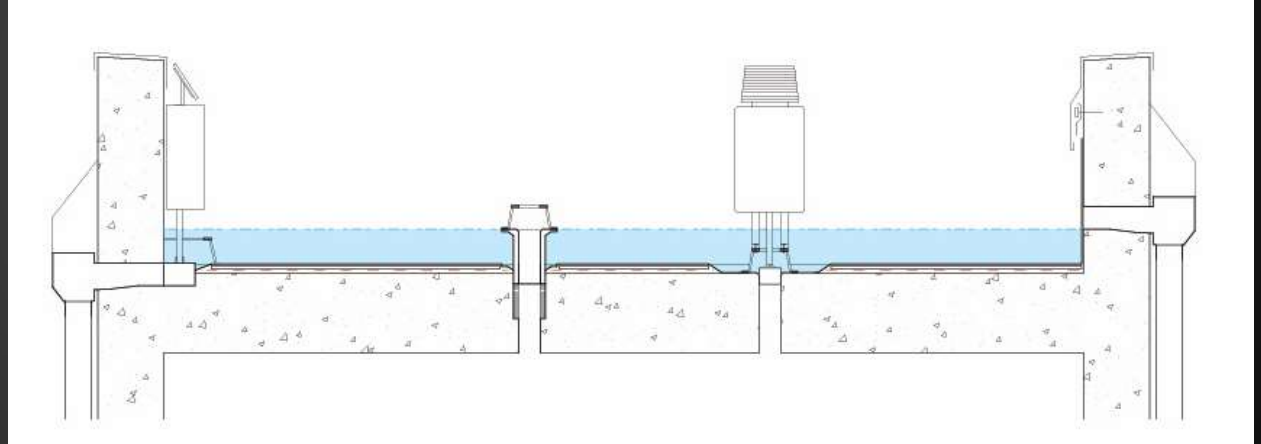


BARRIERS THAT BLU-SMART HAS OVERCOME

- MEETS STRUCTURAL LOAD CAPACITIES – SNOW LOAD
- MEETS PONDING WATER REQUIREMENTS – 72 HOURS AVERAGE – YET CAN BE PROGRAMMED
- HAS INTEGRAL CONSTANT MONITORING LEAK DETECTION AUTOMATICALLY DRAINS THE ROOF IN THE EVENT OF A BREACH
- MEETS ROOFING MANUFACTURER WARRANTY REQUIREMENTS
- IS SIMPLE INSTALLATION FOR APPROVED INSTALLERS

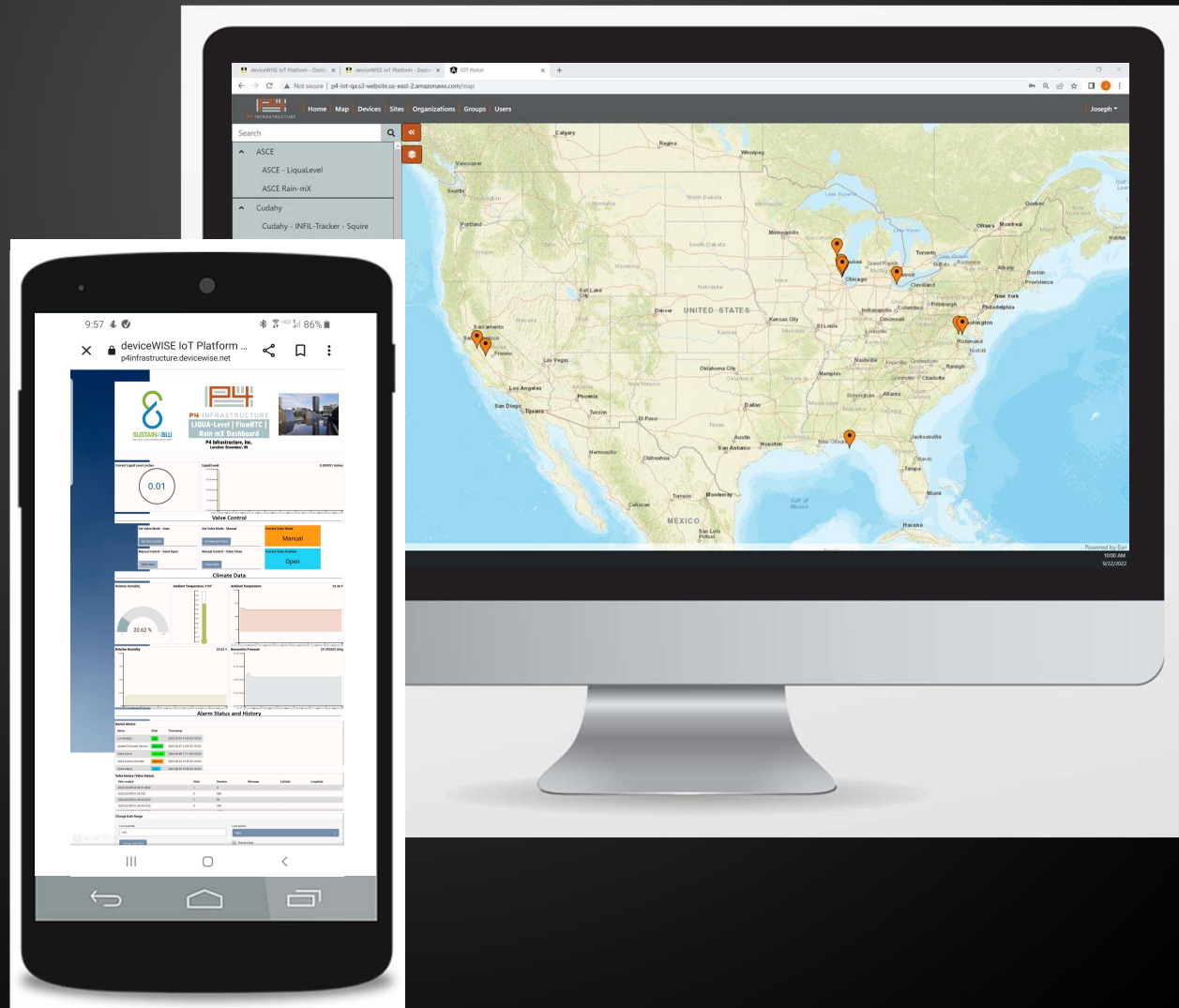


The Blu-Smart Solution



- A prefabricated housing that is placed over either new or existing roof drains or scuppers on a flat roof
- Code compliant system that Collects & Pools Water (up to structural load capacity)
- Utilizes conventional roofing/waterproofing techniques
- Automatically drains the roof if a leak were to occur
- Allows for up to 12" of Stormwater Retention
- Utilizes environmental conditions to manage an exponentially greater amount of stormwater than conventional stormwater methods

DASHBOARDS





COST COMPARISON OF BLU-SMART TO CISTERNS AND OTHER OPTIONS

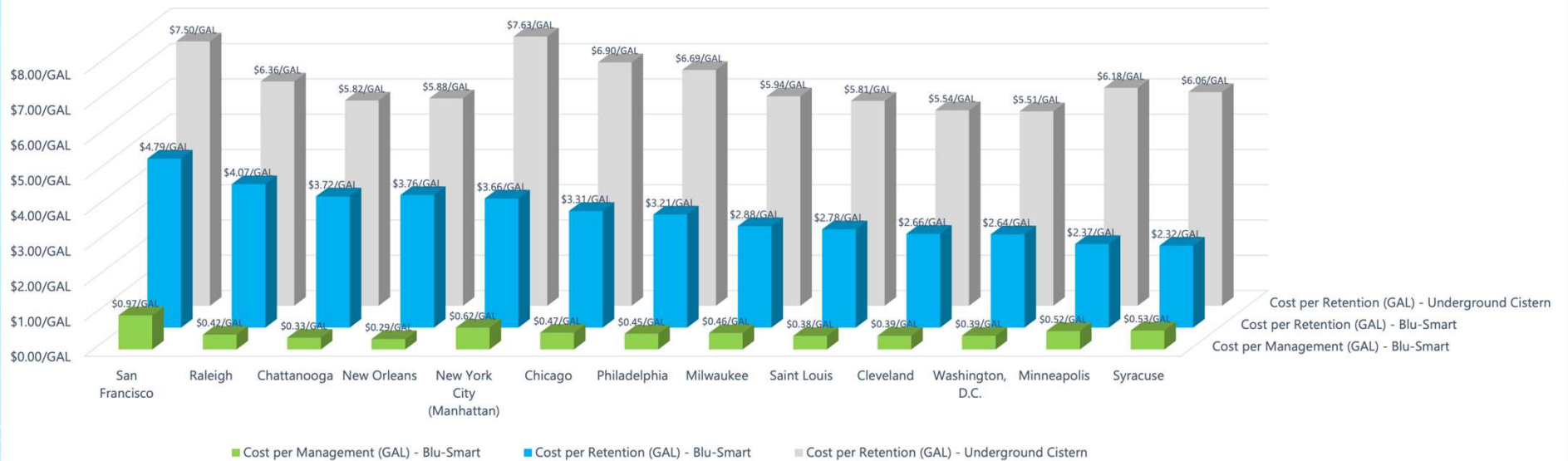
- Cisterns - often \$5-7/gallon, supplied and installed
- Blu-Smart Roofs - \$2-3/gal retained or \$0.46/gal retained with evapotranspiration
 - 40% of cost of cisterns for pure retention
 - 4x to 9x more stormwater management power than cisterns

COMPARISON OF URBAN STORMWATER MANAGEMENT OPTIONS

	BLU-SMART	PAVER-PEDESTAL?	EXTENSIVE GREEN ROOF	SEMI-INTENSIVE GREEN ROOF	INTENSIVE GREEN ROOF	UNDERGROUND CISTERNS
System Type	Smart Blue Roof Stormwater Management - 4" Retention Depth	Amenity Deck/Paver-Pedestals	Extensive Green Roof - 4" Depth	Semi-Intensive Green Roof - 12" Depth	Intensive Green Roof - 21" Depth	Underground Cistern or Containment System
\$ / Square Foot	\$7.42 / SF	\$20.78 / SF	\$17.94 / SF	\$24.61 / SF	\$37.14 / SF	\$VARIES / SF Depth Dependant
\$ / Retention Gallon	\$2.88 / Gallon Retained	N/A	\$5.76/ Gallon Retained	\$4.26 / Gallon Retained	\$4.85/ Gallon Retained	\$5.94/ Gallon Retained
\$ / Management Retention Rate	\$0.46 / Gallon Retained	\$0.59 / Gallon Retained	N/A	N/A	N/A	N/A
Labor Hours / 1,000 Square Feet (SF)	7.4 Hours / 1,000 SF	110.9 Hours / 1,000 SF	51 Hours / 1,000 SF	90.1 Hours / 1,000 SF	121.9 Hours / 1,000 SF	55.1 Hours / 1,000 SF
Roof Coverage (SF) / Pallet	4,350 SF / Pallet	84 SF / Pallet	96 SF / Pallet	45 SF / Pallet	26 SF / Pallet	74 SF / Pallet
Crane Hours / 1,000 SF Roof Coverage	0.2 Crane Hours / 1,000 SF	3 Crane Hours / 1,000 SF	3 Crane Hours / 1,000 SF	6 Crane Hours / 1,000 SF	9 Crane Hours / 1,000 SF	4 Equipment Hours / 1,000 SF
Target Markets	Any urban or dense development where volume stormwater management is regulated	Multi-family & outdoor commercial spaces	Long term real estate holders, e.g. Education, Healthcare, Multi-family, Developers, & Management Firms	Multi-family & outdoor commercial spaces	Multi-family & outdoor commercial spaces	Any urban or dense development where volume stormwater management is regulated

FINANCIAL BENEFITS OF BLU-SMART

Blu-Smart Efficiencies: Underground Cistern vs. Blu-Smart





MUNICIPAL STORMWATER MANAGEMENT FUNDING PROGRAMS

ATLANTA (Negotiated Projects)

BOSTON (Negotiated Projects)

CHATTANOOGA (\$100,000/Project)

CLEVELAND (\$250,000/Project)

DETROIT (Negotiated Projects)

MILWAUKEE (Up to \$500,000/Project)

MINNEAPOLIS (Up to \$200,000/Project)

NYC (2 Programs, Up to \$200,000/Project or \$600,000+)

PHILADELPHIA (Up to \$250,000/Project)

PITTSBURGH (Negotiated Projects)

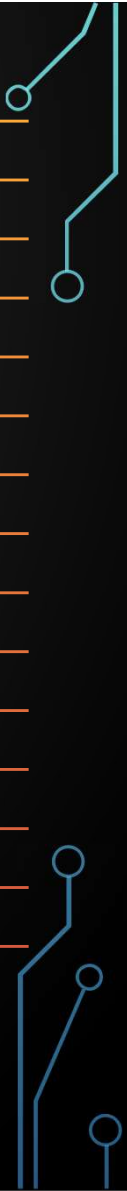
SAINT LOUIS (Up to \$750,000/Project)

SAN FRANCISCO (Up to \$2,000,000/Project)

SEATTLE (Up to \$100,000/Project)

SYRACUSE (Up to \$200,000/Project)

WASHINGTON, DC (Up to \$40 SF/Project)





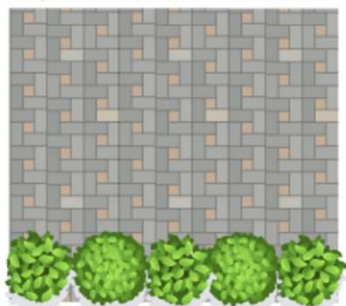
NYC REQUIREMENTS FOR ON-SITE STORMWATER MANAGEMENT

- 2012 Amendments to Chapter 31 of Title 15 of the Rules of the City of New York:
 - “Any new/redevelopment in the combined sewer area must limit off-site discharges to 0.25 cfs through retention or detention in order to reduce CSO discharges downstream during rain events.”
- Feb 2022 – Unified Stormwater Rule (USWR)
 - Reduces the lot size threshold that triggers requirements

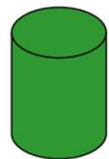


COSTS FOR MEETING OFFV

Impervious surface = 14,000 ft²



SWRv



10,000
GALLONS

-

On-site
Retention



7,000
GALLONS

=

Offv



3,000
GALLONS

Cost to Achieve 3,000 gal Offv

	In-Lieu Fee	SRCs
Annual	$= \$3.78 \times 3,000$ $= \$11,340$	$= \text{SRC Market Cost} \times 3,000$ $= \$4,710 \text{ (if cost = \$1.57)}$
5 years	$= 5 \times \$3.78 \times 3,000$ $= \$56,700$	$= 5 \text{ yrs.} \times \text{SRC Market Cost} \times 3,000$ $= \$23,550 \text{ (if cost = \$1.57*)}$

* When purchasing High-Impact SRCs, buyers can reduce their price by purchasing in bulk

@DOEE_DC

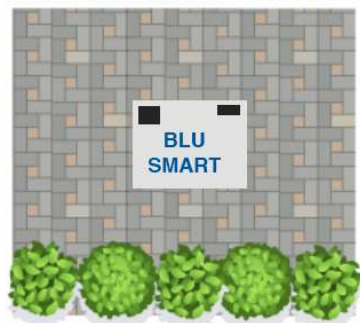
CASE STUDY:

DC GREEN ROOF
ONLY MEETS 70%
OF ON-SITE
RETENTION
REQUIREMENTS.

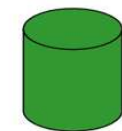
TO COVER
REMAINING 30%,
MUST EITHER PAY FEE
OR BUY CREDITS.

REVENUE OF SMART BLUE ROOFS RETAINING EXCESS STORMWATER

Impervious surface = 14,000 ft²



SWRv



10,000
GALLONS

-

On-site
Retention



35,000
GALLONS

= SRCs



25,000
GALLONS

Annual Income from Sale of Credits Earned

	SRCs
Annual	= SRC Market Cost x 25,000 = \$39,250 (if cost = \$1.57)
5 years	= 5 yrs. x SRC Market Cost x 25,000 = \$196,250 (if cost = \$1.57*)

* When purchasing High-Impact SRCs, buyers can reduce their price by purchasing in bulk

URBANSTRONG

CASE STUDY:

DC SMART BLUE
ROOF EXCEEDS ON-
SITE RETENTION
REQUIREMENTS.

SELLS SURPLUS
CREDITS ANNUALLY
FOR A STEADY
PASSIVE REVENUE
STREAM.

SUMMARY OF BLU-SMART BENEFITS

- LOWEST COST TO MEET URBAN STORMWATER REGULATIONS
- DOES NOT REQUIRE ADDITIONAL STRUCTURAL REQUIREMENTS
- HAS INTEGRAL CONSTANT MONITORING LEAK DETECTION AUTOMATICALLY DRAINS THE ROOF IF A BREACH WERE TO OCCUR
- MEETS ROOFING MANUFACTURER WARRANTY REQUIREMENTS
- SIMPLE INSTALLATION



THANK YOU FOR YOUR TIME...



VE@SUSTAINABLU.US



INFO@P4I.IO

...ANY QUESTIONS?