


Reducing CSOs with Distributed Green Stormwater Infrastructure

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Agenda

1. Background
2. Challenges
3. Alternatives Analysis
4. Overview of Plan
5. Cost and Affordability
6. GSI Toolbox
7. Case Studies
8. Community Engagement

Philadelphia's Streams

Historic Streams

Current Streams

Philadelphia's Sewer Network

- 3,000 linear miles of sewers
- 3 wastewater treatment plants
- 455 separate sewer outfalls
- 164 combined sewer outfalls

Implementation Alternatives Analysis

- Complete sewer separation
- Large-scale storage (tunnels)
- Plant expansion, satellite treatment
- GSI with increased transmission and treatment
- GSI with targeted traditional infrastructure

Implementation Alternatives Analysis

Economic Benefits

- Affordable
- Scalable
- Meets CSO policy goals
- Meets watershed-based planning goals
- Creates jobs

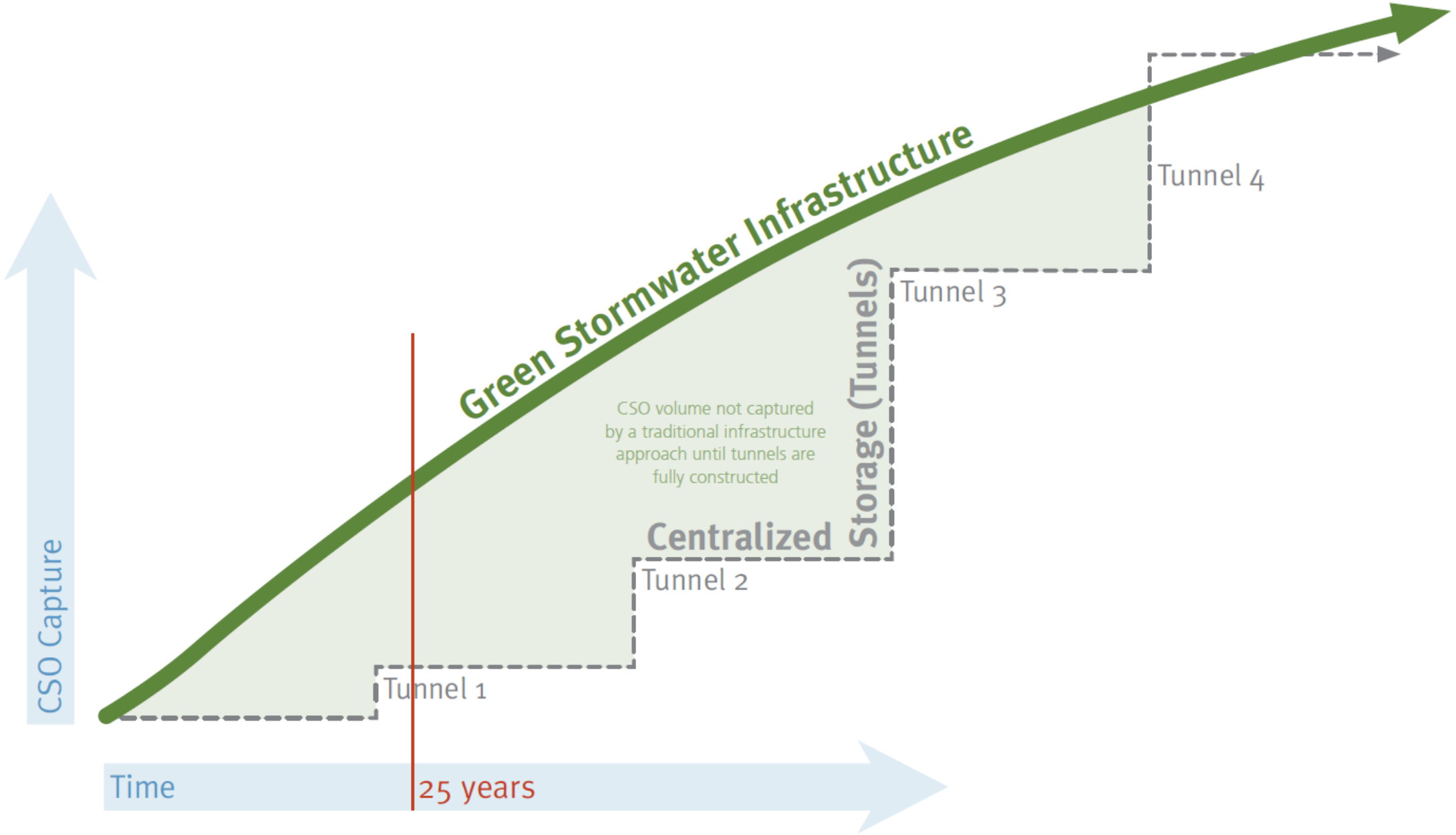
Environmental Benefits

- Restores ecosystems
- Improves air quality
- Saves energy
- Offsets climate change

Social Benefits

- Enhances recreation
- Improves community quality of life
- Reduces effects of excessive heat

Implementation Alternatives Analysis

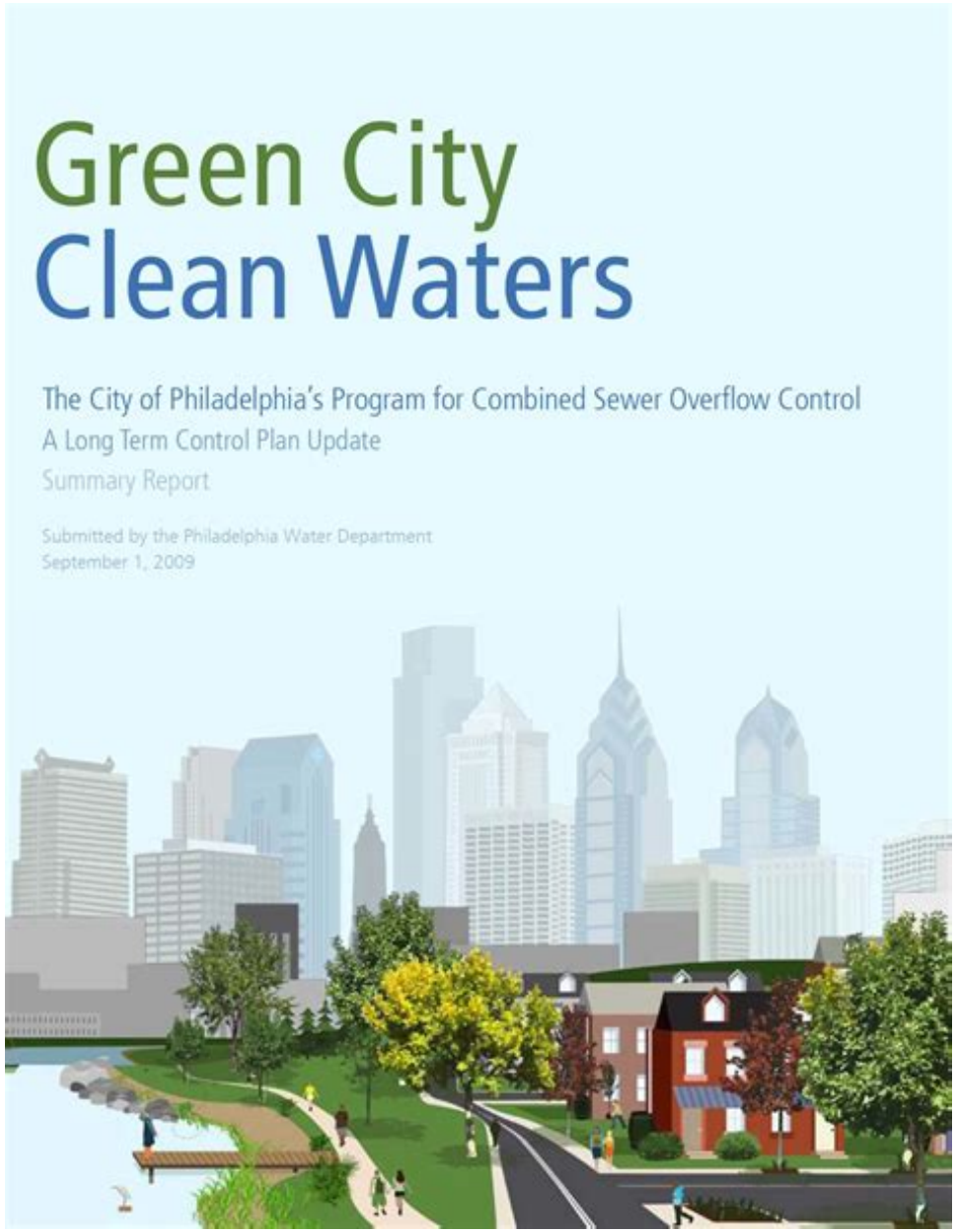


Implementation Alternatives Analysis

- Cost-effective
- Ability to leverage funding
- Meets watershed-based goals
- Maximizes triple bottom line
- Benefits accrued faster
- All watersheds/areas benefit
- Public wants it!

GSI with targeted traditional infrastructure

Green City, Clean Waters



$2.4 Billion Investment

- $1.67 Billion Green Stormwater Infrastructure
- $345 Million Wet Weather Plant Upgrades
- $320 Million Adaptive Management

Goals

- Reduce CSO volumes by 85%
- Create 9,500 “Greened Acres”
- Meet water quality standards

Performance Indicator: "Greened Acre"

"Greened Acre"

- Management of first 1-2 inches of runoff from 1 acre of impervious cover within the combined sewer area.
- Units are Acre-Inch

1 Acre of Impervious Cover = 1,000,000 Gallons of Stormwater Runoff Annually

Cost and Affordability

Private Development

- Stormwater Regulations
- 1% Redevelopment Rate
- $1 Billion

Stormwater Retrofits

- Stormwater billing
- Stormwater credits
- Stormwater grants

Grants

- William Penn Foundation
- EPA
- Growing Greener (PADEP and DCNR)
- Army Corps of Engineers
- City Agencies
- $1 Billion

$2.4 Billion Investment

Green Infrastructure Toolbox

- Stormwater Tree Trenches
- Stormwater Bumpouts
- Rain Gardens
- Bioswales
- Stormwater Planters
- Stormwater Tree Pit Inlets
- Pervious Pavements

Stormwater Tree Trench

Stormwater Tree Trench Examples

Corner Stormwater Bumpout

Mid-Block Stormwater Bumpout

Stormwater Bumpout Examples

Rain Garden

Rain Garden Examples

Bioswales

Bioswale Examples

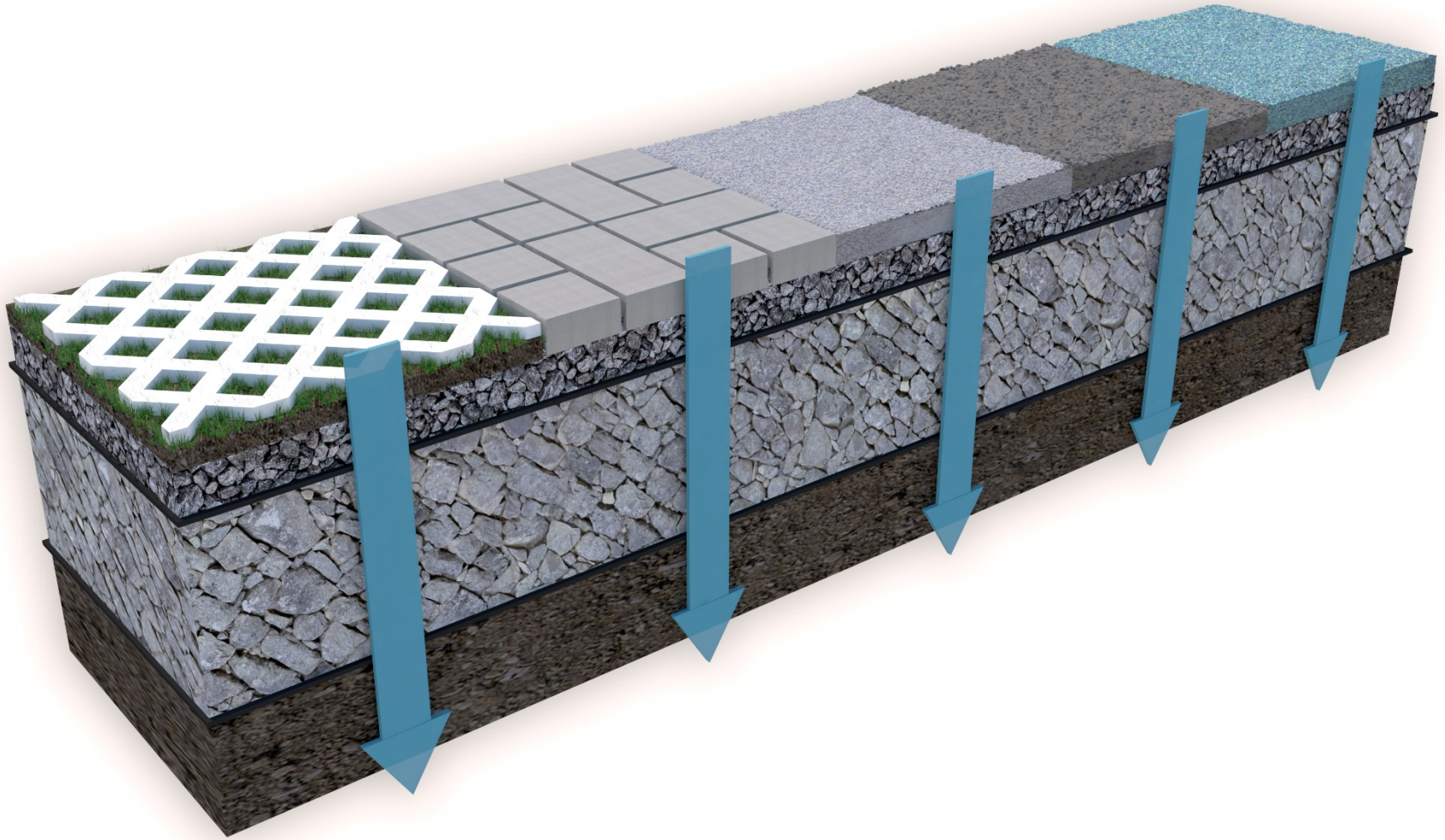
Stormwater Planter

Stormwater Planter Examples

Stormwater Tree Pit Inlet

Stormwater Tree Pit Inlets Example

Porous Pavements



Porous Pavement Examples

Street Transformation

Public Right-of-Way

- Green Streets Initiative
- Partner: Parks and Recreation Department
- Stormwater Tree Trenches along three sidewalks surrounding park
- New sidewalks and street trees
- Coordinated design features with park upgrades

Managed Area = 22,500 SF (0.68 Greened Acres)

School Yard Transformation

Nebinger Elementary School

- Green Schools Initiative
- Partners: EPA and Partnership for the Delaware Estuary
- Stormwater Bioswale, Rain Garden, Porous Pavement, and Subsurface Storage
- Managed Area = 45,500 SF (1.88 Greened Acres)
- Green City, Clean Waters School Curriculum
- Outdoor classroom

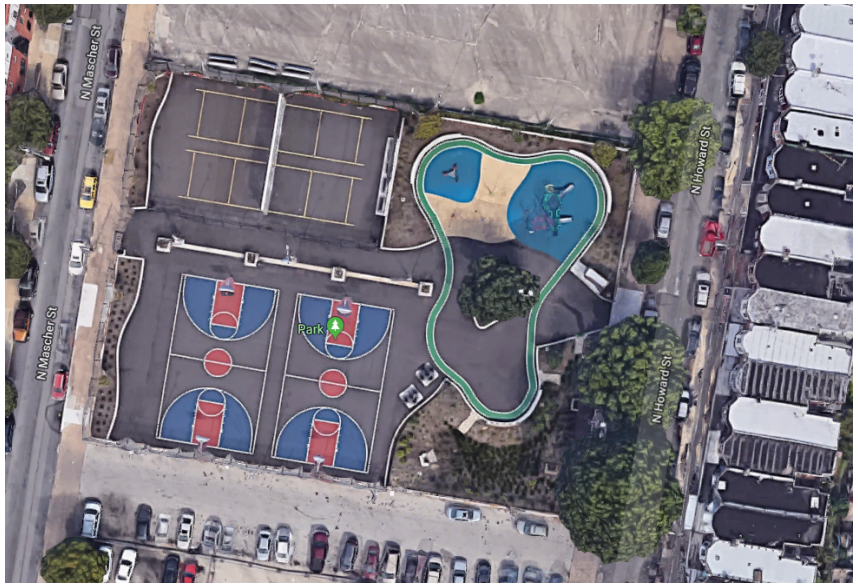
Managed Area = 45,500 SF (1.88 Greened Acres)

Playground Transformation

Jose Manuel Collazo Playground

- Trust for Public Land – Parks for People Initiative
- Partners: Trust for Public Land, Councilwoman Quinones Sanchez, DNCR, Public Property, Parks and Recreation, William Penn Foundation, National Recreation Foundation, McLean Contributionship
- Stormwater Rain Garden with subsurface storage
- Underused, deteriorated playground, poor neighborhood with lack of green space
- New basketball courts, spray ground, tricycle track, playground equipment, hand ball courts

Managed Area = 54,800 SF (2.52 Greened Acres)



Vacant Land Transformation

Heston Gardens

- Green Parks Initiative
- Partners: Councilman Jones, Public Property, Parks and Recreation, Philadelphia Horticulture Society, Hestonville Community Groups, Mural Arts
- Stormwater Rain Garden with subsurface storage
- Managed Area = 28,700 SF (1.00 Greened Acres)
- Vacant lot with chain-linked fence around perimeter
- Recipient of Soak It Up Adoption Grant

Managed Area = 28,700 SF (1.00 Greened Acres)

Soak It Up Adoption

- Grant program
- Up to $5,000 / year
- Weekly monitoring and general maintenance
- Assist with public engagement in community

Community Engagement

rain check

- Grant program
- Up to $2,000 / household
- Beautify home
- Stormwater Management
- Public Awareness

Community Engagement

POWER CORPS PHL

- Service partner with PWD
- Trains at-risk youth new “green” skills to support Green City, Clean Waters
- Creates environmental stewards across the city

Community Engagement

GREEN STORMWATER INFRASTRUCTURE PARTNERS

REIMAGINING STORMWATER

sbn
Sustainable Business Network of Greater Philadelphia

- Advances and supports local green stormwater infrastructure industry
- Provides "green" training for local firms
- Hosts annual "Excellence in Green Stormwater Infrastructure" awards event

THANK YOU

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