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HUGO WALL SCHOOL  
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# COMPARING STORMWATER COSTS: ONLINE TOOL TO ASSIST WITH LIFECYCLE COST ANALYSIS

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**KWEA/KsAWWA  
Joint Conference**

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# Our Agenda

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Background

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Objective

03

Approach

04

Community  
Engagement  
Plan

05

Path Forward

## BACKGROUND

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- ▶ Integrated Planning
- ▶ WERF Survey
- ▶ Project Team

# CLASIC: Community-enabled Lifecycle Analysis of Stormwater Infrastructure Costs

## OBJECTIVES

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- ▶ Develop a tool
  - ▶ Life-cycle cost based
  - ▶ Accommodates regional scale variations
  - ▶ Assess uncertainty
- ▶ Supported by cost and performance data
- ▶ Incorporates community input



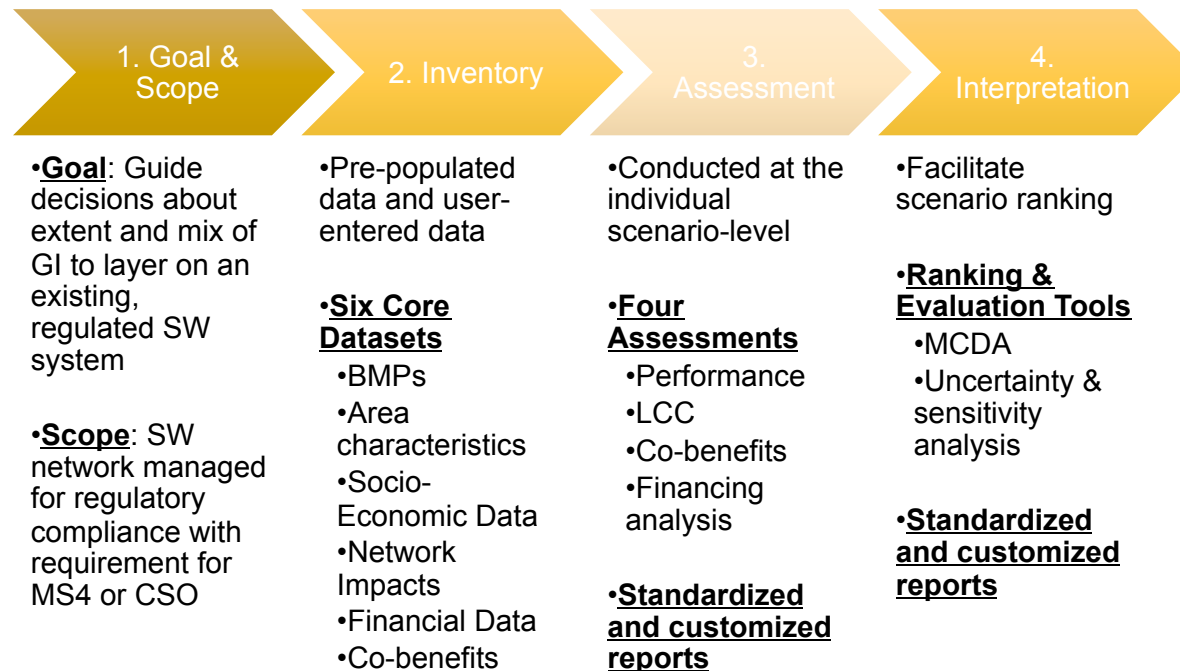
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# APPROACH

# LCC FRAMEWORK FOR CLASIC



# GOAL & SCOPE

## Vision

*The CLASIC tool serves as a screening tool to guide decision making by SW asset managers about the extent and mix of GI to layer on an existing storm sewer system*



### What it does

Analyze & screen scenarios at neighborhood or watershed scale

Assist in policy development



### Tool Features

LCC, TBL, MCDA

Preference ranking

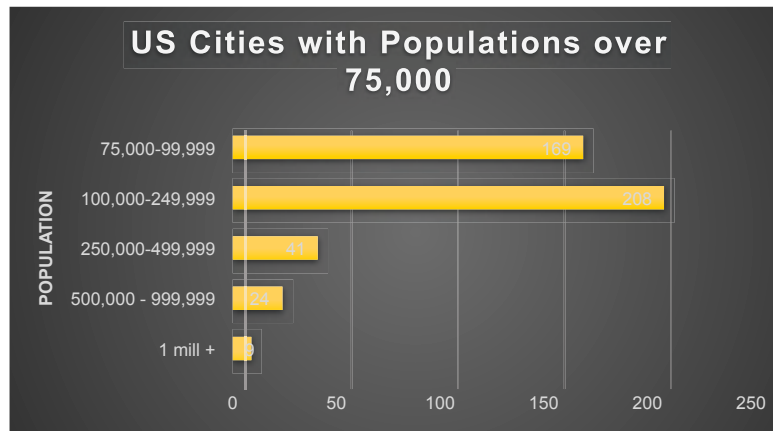
Cost incidence

Financing strategy

**MCDA Performance Matrix**

	Alternative			Criterion Weights
	1	2	3	
Efficacy	##	##	##	##
Safety	##	##	##	##
Quality of Life	##	##	##	##
Functional Status	##	##	##	##
Dosing Convenience	##	##	##	##
Price	##	##	##	##
Cost-Effectiveness	##	##	##	##
Budget Impact	##	##	##	##

# TOOL USERS



## ▶ Target Users: Stormwater Utilities

- ▶ Operates within a stand alone service unit of municipal government with explicit purpose of SW management:
  - ▶ Dedicated funding, or
  - ▶ Dedicated fund
- ▶ Estimated 1,583 stormwater utilities in the US. Average population is 70,765; median population is 18,390 (WKU SW Utility Survey, 2016).



# CONTEXT AND SCOPE

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## Compliance

- *MS4, CSO obligations*
- *Performance metrics tied to permit requirements*
- *Layering green infrastructure on existing SW assets*

## Scope

- *Functional unit definition*
- *Boundaries*



### Context <-> Scope

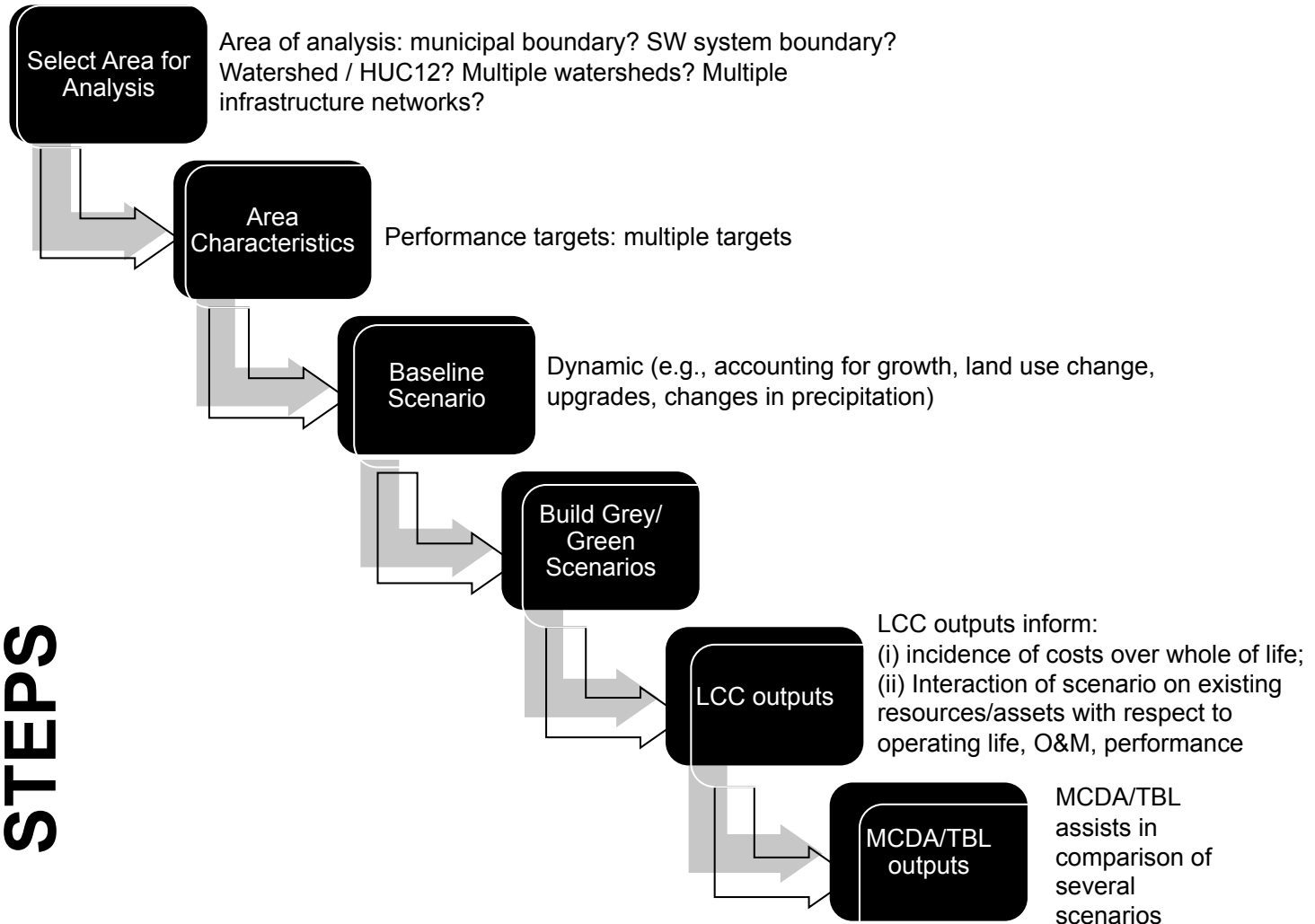
*Decisions are interdependent*



### Boundary Dimensions

1. *Physical*
2. *Temporal*

# CLASSIC TOOL STEPS





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# COMMUNITY ENGAGEMENT

# COMMUNITY ENGAGEMENT PLAN

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- ▶ Conduct in 3 phases
  - ▶ Phase 1 - Tool development
  - ▶ Phase 2 - Tool beta testing
  - ▶ Phase 3 - Tool implementation and marketing
- ▶ Initial engagement in first quarter 2017
- ▶ Preliminary, high-level engagement with a wide cross-section of communities

# ENGAGEMENT PURPOSE

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- ▶ Target the right users
  - ▶ Types of systems, population
- ▶ Meets community's financial and technical needs
  - ▶ Type of tool
  - ▶ Key drivers in decision making
  - ▶ Demand and use of tool



## COMMUNITIES INTERVIEWED

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Lancaster, PA

Cincinnati, OH

Savanna, GA

Los Angeles, CA

New York, NY

Albuquerque, NM

Baton Rouge, LA

Lenexa, KS

Boise, ID

Washington, DC

Kansas City, MO

Boston, MA

Northern Kentucky Sanitation District 1

Omaha, NE

Milwaukee, WI

Chicago, IL

Denver, CO

Baltimore, MD

Hillsboro, OR

Wichita, KS

Phoenix, AZ

Ft. Collins, CO

Fairfax Co, VA

Austin, TX

# MANAGING DEPARTMENTS/AGENCIES

	Combined Sewer		MS4	
Public Works	Lancaster Cincinnati		Lenexa Savanna New York Baton Rouge Boise	Fairfax Co Los Angeles Albuquerque Lenexa
Water and Sanitation or standalone district	DC KY SD #1 Milwaukee Chicago	Kansas City* Omaha*	Boston Baltimore Wichita Ft. Collins	Denver Hillsboro Phoenix

\*Separate CSO Division

## THE QUESTIONS

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- ▶ Background information
- ▶ Drivers for decision making
- ▶ Technologies and practices
- ▶ Unintended consequences and/or benefits
- ▶ Technical information needed
- ▶ Financial information needed
- ▶ Type of tool outputs
- ▶ Function and usability of tool
- ▶ Types of green infrastructure benefits
- ▶ Financial and/or technical data available



# WHAT DID WE LEARN?



## Drivers

- Compliance
- Water quality
- Customer driven performance
- Sustainability/ Economic development
- Cost and asset predictability



## Common Practices

- Grass swales and buffers
- Native vegetation
- Bio swales
- Rain gardens
- Retention ponds
- Rain barrels
- Stream restoration



## Financial Information

- Life cycle cost approach
- Measuring co-benefits
- O&M costs
- Technology effectiveness

# GRAY INFRASTRUCTURE BENEFITS/BARRIERS

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## ▶ Benefits

- ▶ Known effectiveness of practices
- ▶ Known costs
- ▶ Easily modeled
- ▶ Water reuse opportunities

## ▶ Barriers

- ▶ Inconsistent across communities
  - ▶ Downstream flooding
  - ▶ Out of sight
  - ▶ Failures can be catastrophic
  - ▶ Faster than anticipated depreciation
  - ▶ Stagnant reservoirs
  - ▶ Inability to fully meet consent decrees
  - ▶ Inability to meet water quality

# GREEN INFRASTRUCTURE BENEFITS/BARRIERS

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## ▶ Benefits

- ▶ Increased open space
- ▶ Partnerships
- ▶ Runoff volume reduction
- ▶ Quality improvements for volume reduction projects
- ▶ Education

## ▶ Barriers

- ▶ Lack of understanding
- ▶ Non-traditional approach
- ▶ Increased O&M costs
- ▶ Unknown effectiveness
- ▶ Optimization period
- ▶ Education

# TECHNOLOGY NEEDS

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- ▶ Menu of stormwater technologies
- ▶ Climate change
- ▶ Useful life
- ▶ Maintenance schedules
- ▶ More informed decisions



## THE TOOL

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### ▶ Outputs

- ▶ Premature for the majority of communities
- ▶ Focus on engineering and development staff
- ▶ Translation to council/board
- ▶ GIS-based presentation

### ▶ Usability

- ▶ Premature for the majority of communities
- ▶ Enterprise based
- ▶ Developers and property owners as users

## MEASURING BENEFITS

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- ▶ Quantifying GI benefits
- ▶ Data volume and quality varied
- ▶ Variety of formats



## COMMENTS AND CONCERNS

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- ▶ National tool
- ▶ Assumptions and rational
- ▶ Participation
  - ▶ Follow-up calls
  - ▶ Beta testing
  - ▶ Case studies



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# THE PATH FORWARD



# TIMELINE

Task	2017 Q1	2017 Q2	2017 Q3	2017 Q4	2018 Q1	2018 Q2	2018 Q3	2018 Q4	2019 Q1	2019 Q2
<b>Task 1: LCC Framework Development</b>	1	1	1	1	1					
<b>Task 2: Data Collection</b>			1	1	1					
<b>Task 3: Data Analysis &amp; Standardization</b>				1	1					
<b>Task 4: Decision Support System Development</b>					1	1	1	1	1	
<b>Task 5: Community Engagement</b>	1	1	1	1	1	1	1	1	1	1