

Stormwater Management Strategies

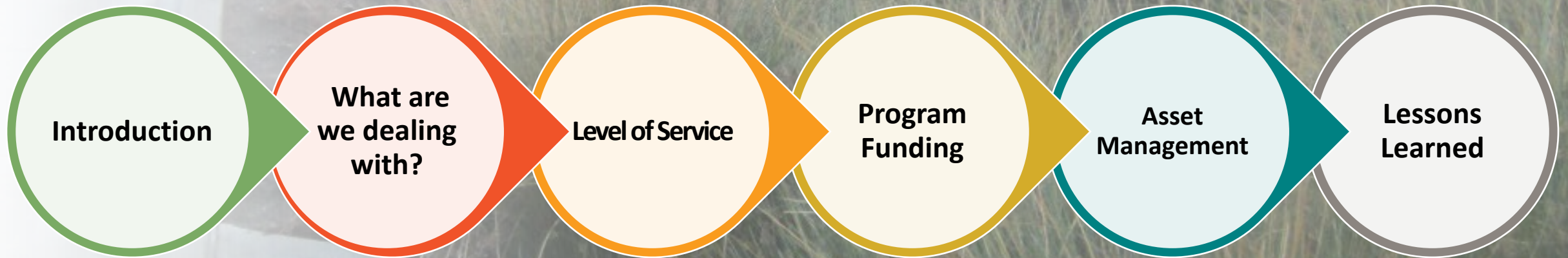
The Private Perspective

Seth Robertson, PE
WithersRavenel



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Overview

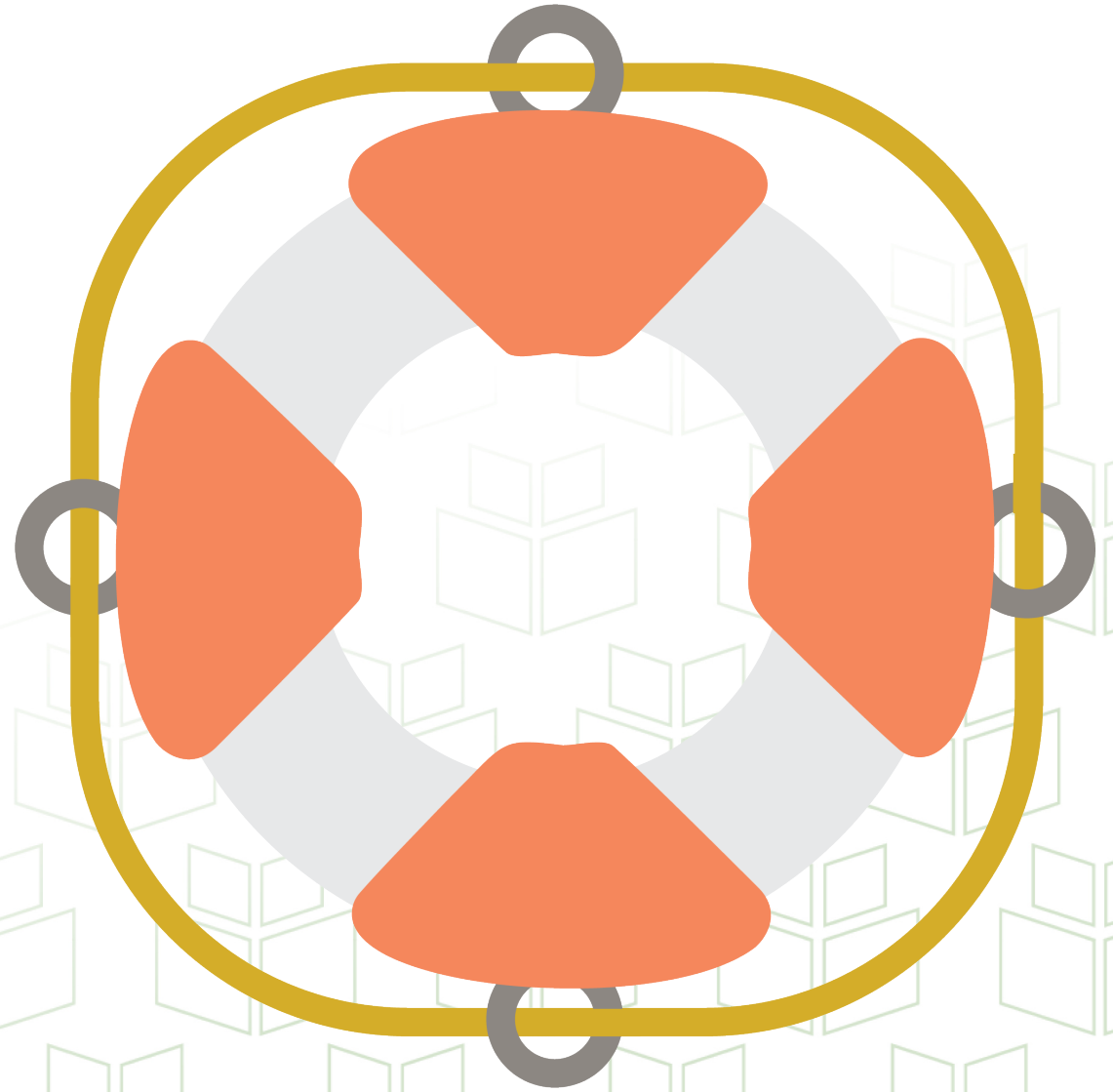


The background of the slide features a repeating pattern of white-outlined cubes. Each cube is composed of three smaller cubes stacked together, creating a 3D effect. The pattern is set against a teal-to-green gradient background.

What are we dealing with?

Staying Afloat

- **Unfunded mandate**
- **Operation and maintenance**
- **Failing infrastructure**
- **Increasing flood events**
- **Financial limitations**



DEQ MS4 Compliance Audits over 2 Years

Audit Results	Quantity
Notice of Compliance (NOC)	3
Notice of Deficiency (NOD)	3
Notice of Violation (NOV)	24
Compliance Decision Pending	5
Total Audits Completed	35







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Old pipes, big problems: More than 20 sinkholes in Asheville

Joel Burgess jburgess@citizen-times.com


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Editor's note: There have been more than 20 ground collapses, often called sinkholes in the last two decades in Asheville. Nearly all were caused by underground pipe failures. (For the map, Green indicates a failed storm drain pipe or culvert. Blue indicates a failed water line. Yellow means the cause is unknown.) Map not visible? Click [here](#).

While no one was hurt, many of the holes caused traffic disruptions, loss of business income and property damage at times exceeding \$100,000.



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A crew from Allegiant Towing and Recovery works to pull a Chevy pickup out of a sinkhole on Aug. 3, 2020. The truck was found in the sinkhole, which opened up in a parking lot on Biltmore Avenue next to Biltmore Fitness, on July 31, 2020.

ANGELI WRIGHT, ANGELI WRIGHT/ASHEVILLE CITIZEN TIMES



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Quantify Where We Are & Where We Want To Be

- **Evaluate your current program and compliance (GAP analysis)**
- **Establish service goals**
- **Create a plan to move towards your goals over a reasonable time period**



Level of Service Matrix

General Stormwater Operations Level of Service Matrix				
Level of Service	Program Management Activities	NPDES Compliance Activities		Capital Improvement Projects
		Non-O&M Related Compliance Activities	Operation and Maintenance Program Activities	
A or 5	Comprehensive Planning + Full Implementation Capabilities	Exemplary Permit Compliance	Fully Preventative/ 100% Routine	10-year Plan
B or 4	Pro-Active Planning + Systematic CIP Implementation Capabilities	Pro-Active Permit Compliance	Mixture of Routine and Inspection Based	20-year Plan
C or 3	Priority Planning + Partial CIP Implementation Capabilities	Minimal Permit Compliance	Inspection Based	40-year Plan
D or 2	Reactionary Planning + Minimal CIP Implementation Capabilities	Below Minimum Permit Compliance	Responsive Only (Complaint-based)	50-year Plan
F or 1	No Planning + No CIP Implementation Capabilities	Non-Compliance	Less than full response to all complaints	75-year or More Plan



Current Level of Service Self Evaluation Example

- **Partial proactive planning of capital improvement needs**
 - Portion of the system studied with projects identified and scoped
- **Reactive (break & fix) repair/replacement of capital assets**
- **Proactive permit compliance?**
 - City doing 5 measures
 - County performing 1 of the measures
- **Responsive only Operation and Maintenance Activities**
- **\$3/month/parcel flat fee**



Where are you today?

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\$3 / Month



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How Much
Money
Do We Need?

\$\$

\$

Capital Improvement Program

Proactive Operations
Budget for Permit
Compliance &
Inspection

Minimum



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How Will We Raise Needed Money?

- **Taxes**
 - Ad Valorem
 - Service districts
 - Special assessments
- **Utility or User Fees**
- **Combination of taxes and user fees**



Why Create A Utility?

- **Compliance with NPDES is required whether there is a utility or not**
- **Releases funds in the general fund that are needed for street repaving and other activities**
- **Level of “protection” for fees raised**
- **Security to fund improvements through debt**
- **Fairness**





ASSET MANAGEMENT 101

- **Manage Aging Infrastructure**

- Catalog
- Characterize
- Prioritize

- **Systemwide Planning**

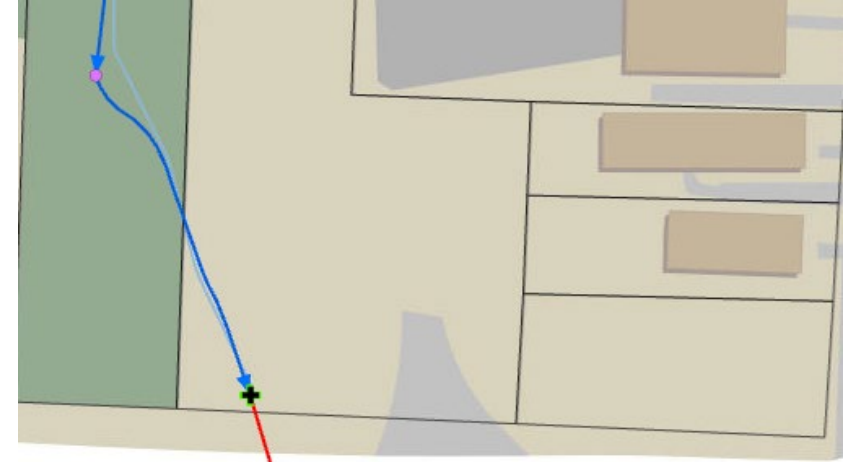
- Leverage Funds
- Lifecycle Cost Assessment





WHAT ARE STORMWATER ASSETS?

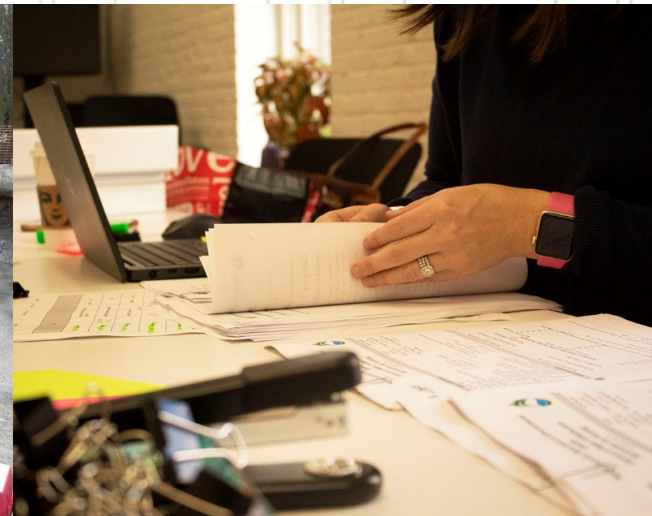
- Curb & Gutter
- Swales
- Inlets
- Pipes
- Culverts
- SCMs
- Natural Systems





CORE COMPONENTS OF ASSET MANAGEMENT

- Current Inventory & Condition
- Level of Service
- Risk Assessment
- Life Cycle Costs
- Funding



Key Considerations

- **Know your community**

- Good mapping and asset inventory data
- Good communication with stakeholders
- Community goals

- **Education**

- Staff: Stormwater, Public Works, Finance, Management understand their program responsibilities
- Elected officials
- Stakeholders

- **Understand cost and time to move from current to future level of service**



The background features a repeating pattern of three-dimensional cubes, each composed of smaller cubes, creating a geometric, isometric effect. The pattern is rendered in a light teal color against a dark teal background. The word "Questions?" is centered in the upper half of the image in a large, white, sans-serif font.

Questions?