



**How do we prioritize  
and fix our drainage  
infrastructure  
problems?**

**And how will we pay  
for it?**

April 23, 2021



# Who is Raftelis?

Raftelis provides **utilities and public-sector organizations** with insights and expertise to help them operate as high-performing, sustainable entities providing essential services to their citizens.

**With more than...**

**120+**

consultants across the U.S.

**Raftelis has provided assistance for**

**1,200+**

public agencies and utilities

**that serve more than**

**25%**

of the U.S. population

**including the agencies serving**

**38/50**

of the nation's 50 largest cities

# Areas of Expertise

## Key Service Areas

Finance



Management



Technology



Communication



## Municipal Storm Water

- Utility development and funding
- Regulatory compliance assistance
- Policy and process development
- Program development and implementation
- Data management
- Stakeholder engagement

# Agenda

## Stormwater Asset Management

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Prioritizing stormwater problems

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Establishing level of service

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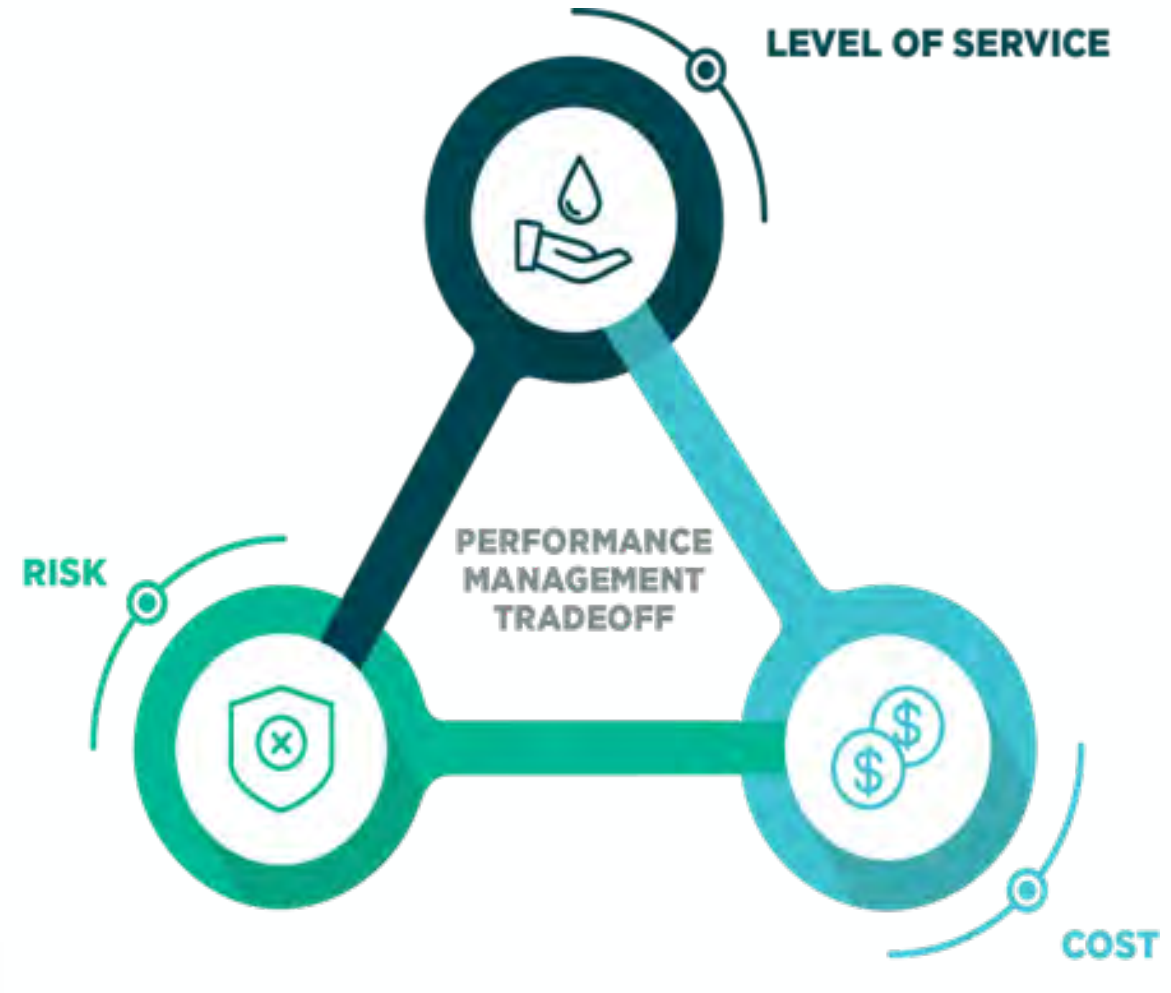
Developing an asset management program

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Integration with current operations

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## Funding Your Program





# Stormwater Challenges

- Aging infrastructure
- Lack of Maintenance
- Surface flooding
- Impaired streams
- Storm intensity
- What size pipe is big enough?

## But there's more...

- Sewage basement backups
- CSOs/SSOs
- Competing priorities
- Lack of funding
- There's a fire!



# Key questions to address these challenges



**1. How do we prioritize what stormwater problems to address first? What criteria should we use?**



**2. What should our community's stormwater level of service be?**



**3. How do we develop a stormwater asset management (AM) program?**



**4. Can the program work seamlessly with my sanitary sewer AM program & complement regulatory compliance requirements?**



- 1. How do we prioritize what stormwater problems to address first? What criteria should we use?**



# How do we prioritize stormwater problems?

## What criteria should we use?

- Prioritize using defensible criteria
- Address problems with the highest scores
- Work within confines of the available budget

Project Specific Criteria (60% of Total Score)	Weighted Factor
Utility/Muni Responsibility	5
Public Health Concerns	4
Public Safety Concerns	4
Property Damage	4
Public Inconvenience	4
Water Quality Benefits	4
Amount of SW added to CSS/SSS	3
Number of Properties Affected	3
Operations & Maintenance Reduction	1
Erosion	1
Frequency of the Problem	1
Condition of the Storm Water System	1
Regional/Watershed Planning Criteria (40% of Total Score)	Weighted Factor
Green First or IWM Programs Benefit	5
Green Infrastructure Opportunities	5
Alignment with City Priorities	4
Coordination with other Development/Utility Priorities	3
Available Outside Funding	2

Degree of Impact	Scoring
None or NA	0
Minor	1
Moderate	2
Severe	3
Extreme or Yes	4

Total Score out of 100





# How do we prioritize stormwater problems?

## Public Health Concerns:

Degree to which persons' well-being is affected

Degree of Impact	Concern
None or NA	No health issues
Minor	Flooding in street
Moderate	Flooding in yard
Severe	Interior flooding or basement backup due to sewer system, stormwater only
Extreme	Interior flooding or basement backup due to sewer system, combined or sanitary sewage

## Property Damage:

Degree to which properties are affected by the problem, both public and private

Classification	Damage
None or NA	No property damage
Minor	Damage up to 5% of property <u>value</u> (minimal damage)
Moderate	Damage between 5% and 10% of property <u>value</u> (minor damage)
Severe	Damage between 10% and 20% of property <u>value</u> (significant damage)
Extreme	Damage greater than 20% of property <u>value</u> (major damage), including any internal house flooding due to 100% utility responsibility



**2. What should our community's stormwater level of service be?**



# Key Considerations

- Can or should we really protect against a 100-year 24-hour storm?
- Should we be more concerned about 1.5 inches of rainfall in 15 minutes?
- If the storm level is exceeded, are affected property owners responsible for the costs?
- What are our priorities? Flooding? Basement backups?

## 1 Level of service peer review

- ❖ Perform national and international review of peers
- ❖ Develop recommendations based on findings for setting an appropriate LOS for your community

## 2 Develop current LOS and range of alternatives for increasing LOS

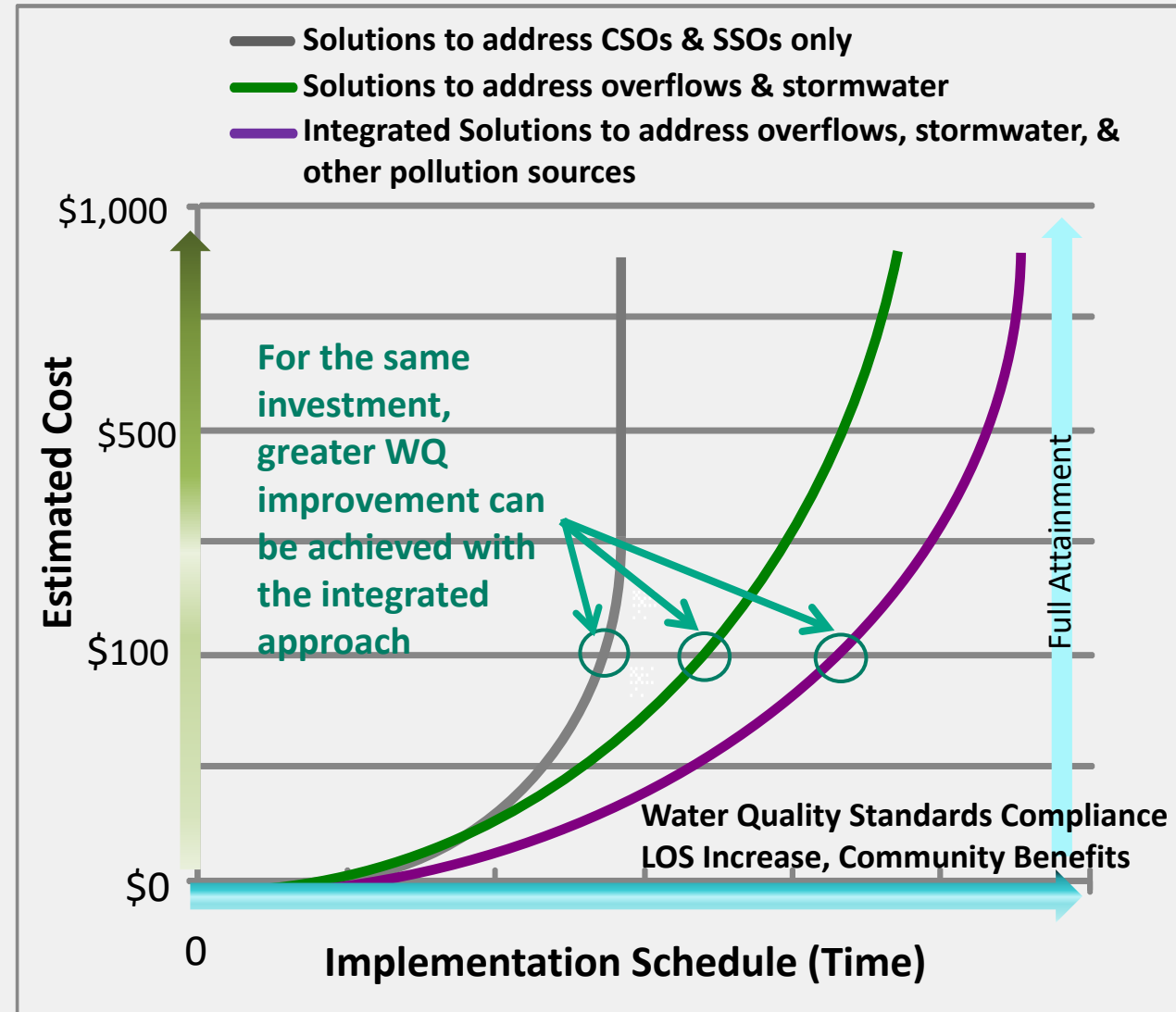
- ❖ Hydraulic analyses of the existing SW system performed
- ❖ Run a series of real and design storms
- ❖ Identify alternatives and planning level costs for increased LOS



# Key Considerations

## 3 How does increased LOS impact CSO/SSO reduction levels (if applicable)?

- ❖ Develop and implement projects that increase the level of protection **and** decrease overflows
- ❖ Build one project that can achieve multiple benefits
- ❖ Identify cost-savings

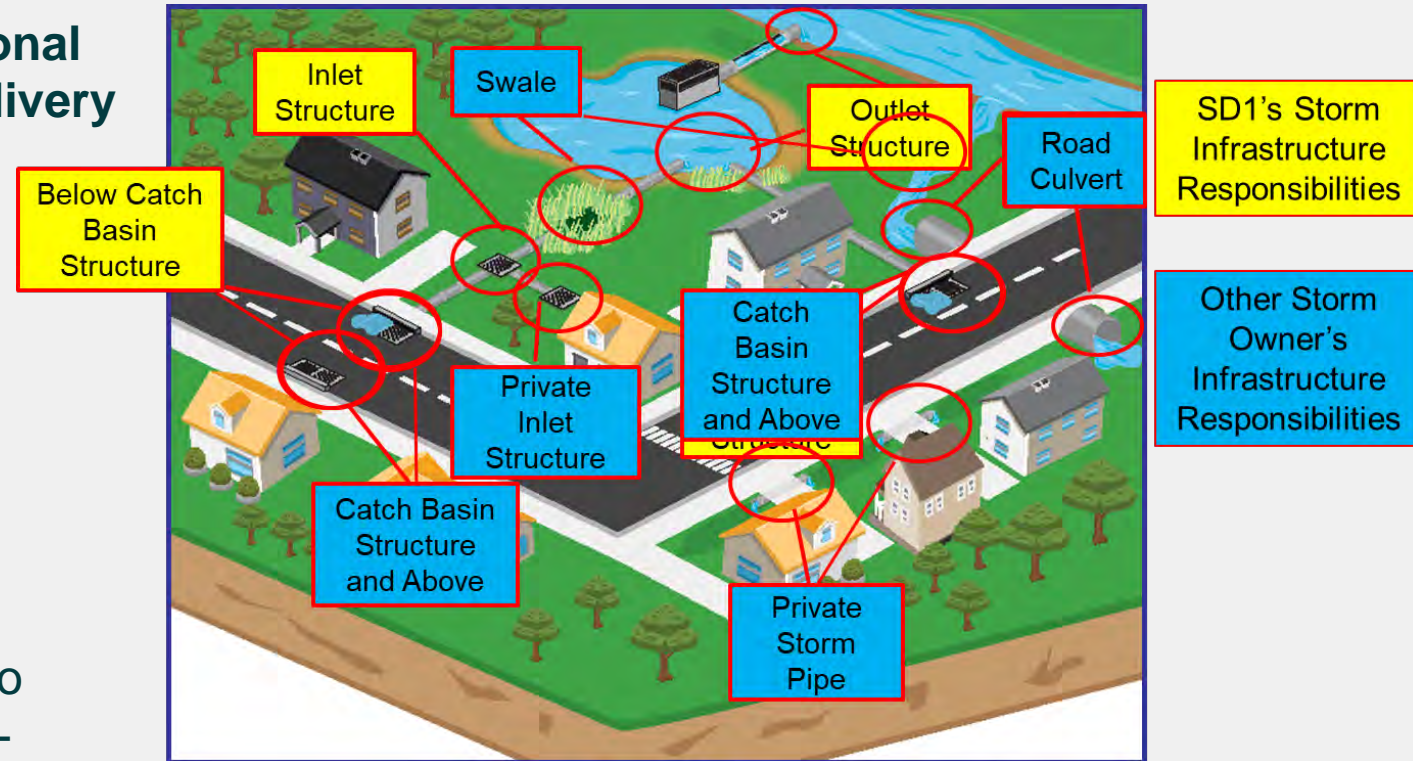




# Key Considerations

## 4 Explore responsibility-sharing and regional collaboration for stormwater service delivery

- ❖ Many surface and subsurface components of stormwater systems
- ❖ Departments and utilities have different resources
- ❖ Not affordable to build infrastructure sized to handle all storm events
- ❖ Shared service delivery can present solutions to further mitigate impacts or provide greater cost-benefit
- ❖ Will this increase LOS?



There are many components of a stormwater system. What is the utility responsible for? What is the road department responsible for? What is the private property owner responsible for?

Source: Sanitation District No. 1 of Northern Kentucky





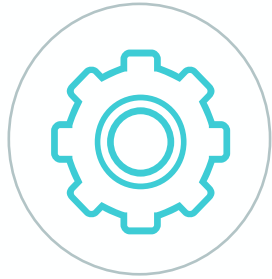
# Key Considerations

## 5 Building code, regulation, policy, and ordinance updates

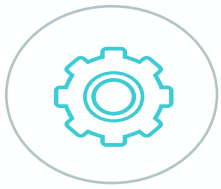
- ❖ Based on selected LOS, identify necessary updates
- ❖ Example areas:
  - Addition of backwater devices during building renovations or new construction
  - Point of sale building lateral inspections, repairs and backwater device installations
  - SW management onsite for new & redevelopment
  - Point of sale downspout disconnections in the combined sewer system







### **3. How do we develop a stormwater asset management (AM) program?**



# Stormwater Asset Management Essentials



## Asset Management Staffing Structure & Governance Team

Who is responsible for the program?

Who should be included in decision making?

## Level of Service and Performance Metrics for Core Activities

What data is being collected to measure performance?

How is performance and risk determined?

## Asset Inventory and Information Tracking in CMMS and GIS

What assets do I own?

What Condition are they in?

What asset data is required to make decisions?

## Prioritize O&M and Capital Investments

What is consequence of failure?

What business risk exposure exists?

How do we prioritize?

## Operation & Maintenance Logic and Strategy To Monitor Risk and Life Cycle

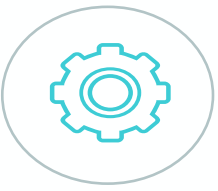
How often should I maintain and fix my assets?

How do I determine when a capital project is required?

## System Health Process to Ensure Integrity

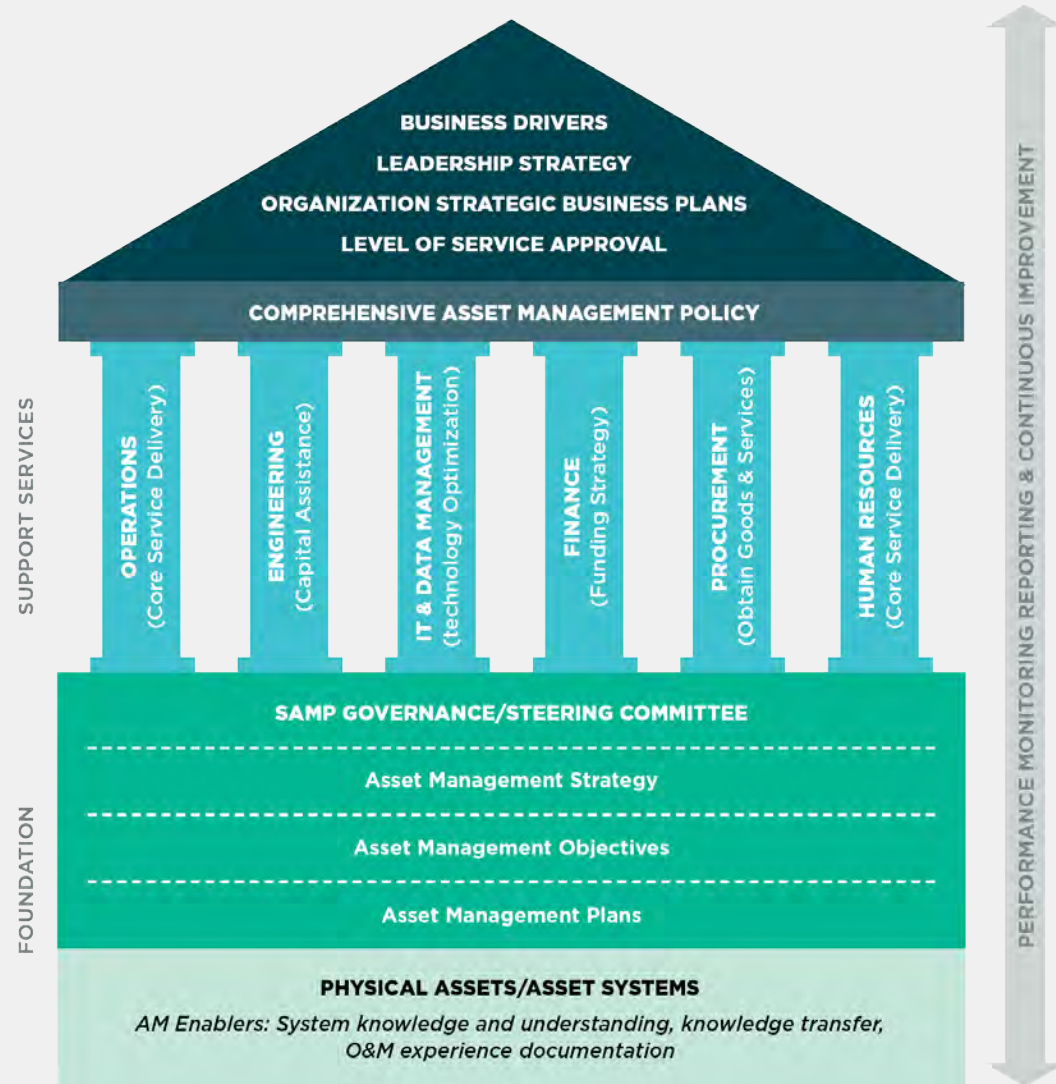
How can I be alerted when an issue is occurring?

How can I measure customer service?



# Governance and Systems Interaction

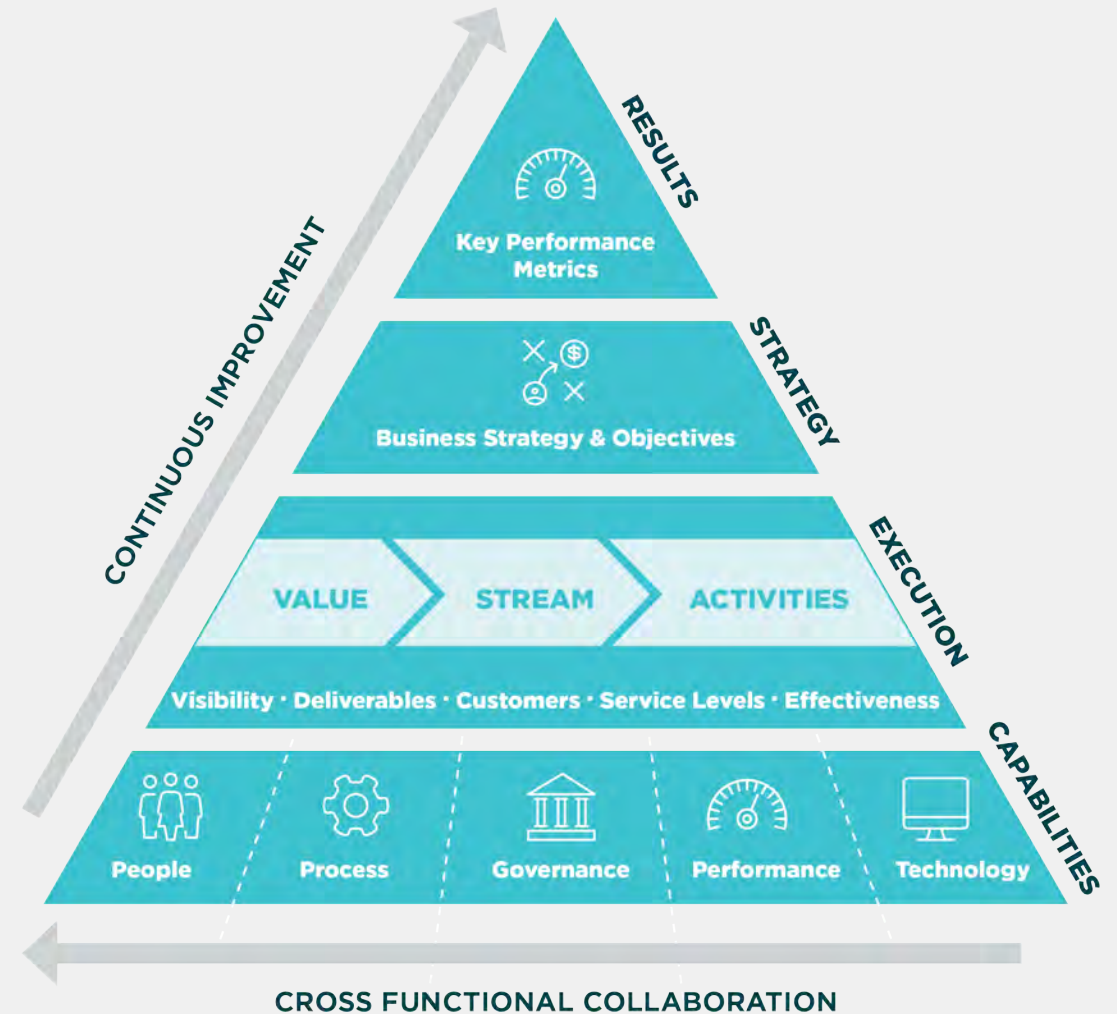
## SAMP FRAMEWORK FOR VALUE DELIVERY





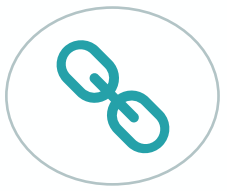
# Maximizing Program Benefits

- Achieve buy-in and transparency
- Collect and aggregate real time data
- Proactive and predictive O&M planning
- Prioritize maintenance and repairs
- Reduced risk of data loss and exceptions
- Cost/Benefit and ROI analysis determination
- Adherence to regulations and service levels
- Communicate value using performance data





**4. Can the program work seamlessly with my sanitary sewer AM program & complement regulatory compliance requirements?**



# It doesn't drive quite like a sanitary system...

## Multiple components of a stormwater system:

- › Streets
- › Curb and gutter
- › Open channels
- › Pipes
- › Inlets
- › Outfalls
- › BMPs or SCMs

## Wide variety of issues:

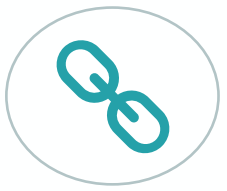
- › Erosion
- › Separation of responsibilities
- › Who's going to cut the grass?
- › Monitoring
- › Public understanding

## Water Quality Impact

- › Direct impact to local waterways
- › Varying pollutants of concern







# But the gas is still on the right...

## Sanitary system overlaps

- Key considerations
  - › Current age and condition of the system
  - › Available funding
  - › Public Expectations
- LOS and risk determination
  - › Provide a means of assessing overall system performance
  - › Determine critical assets
  - › Establish metrics for system management and operations staff
  - › Provide link between costs and service
  - › Continuous analysis of improvements
- Regularly evaluate and adjust both programs
  - › As experience is gained
  - › As future regulations are imposed
  - › As risk tolerance changes





# Customize Customer Care Responses For the Stormwater System

- Customer response to storm issues have different complexities
- Multiple owners can make AM difficult
- May not be Responsible for Overland flooding and Erosion (Private vs. Public)
- Bug infestation due to stagnant water
- Debris blocking storm sewer inlets and CB's
- Changing Swale Alignment/Redirecting Flow







# Educating Our Internal and External Customers

- “Sorry about your luck!”  
Is not good customer service
- Help responders educate HO’s of responsibilities

**Rule of thumb**  
The best maintenance is usually preventative, and most problems with storm water control structures can be avoided with one simple step: Clear trash, leaves and other debris away from storm water structures. Debris leads to clogging, which makes control structures less effective at limiting flooding and erosion.

**SWALE MAINTENANCE**

Perform regular inspections and clear brush.

**Learn more**  
Visit [SD1.org](http://SD1.org) for more information about what SD1 is doing to manage storm water, improve water quality and protect your community from storm water damage.

**Get help**  
If significant erosion, sediment accumulation or other damage is evident in the swale, contact SD1 at 859-578-7450 or [info@sd1.org](mailto:info@sd1.org) to have it inspected. SD1 staff may be able to help determine the cause of the problem and the individual or entity responsible for the maintenance.

For more information about properly maintaining storm water control structures on private property, call a local engineer or landscape architect.

**Maintaining Swales**

**Storm water, SD1 & you**  
As our communities grow, our neighborhoods include an increasing number of buildings, roads and parking lots. This growth is important for our local economy, but the additional hard, impervious surfaces prohibit rain and snow melt from soaking into the ground. This creates storm water runoff, which can lead to erosion and flooding that may damage homes and landscaping, make travel difficult and affect recreation and wildlife habitats.

To control storm water runoff, Sanitation District No. 1 (SD1) maintains an expansive system of storm sewer pipes and other structures, but it is only one piece of the storm water puzzle – cities, counties and individual property owners also play an important role.

**Your role**  
When new homes, businesses and neighborhoods are built, developers often install control structures at individual project sites to manage runoff. These storm water control structures sometimes interconnect with neighboring property or with infrastructure under SD1's control, but responsibility for structures on private property often lies with property owners, homeowner associations or property management companies.

**It is essential that private property owners properly maintain storm water control structures on their property to ensure the entire system runs smoothly.**

Private property owners also should be careful when adding new structures, like a shed, or making major landscaping changes to their property. If a change reroutes storm water and has a negative impact on properties downstream, the matter could become a legal issue among neighbors.

**Good neighbors**  
While individual property owners are required to maintain some storm water control structures, they also can take voluntary steps to help the whole community. Even if a structure is publicly owned, citizens can protect their community from flooding and other problems by simply clearing away nearby debris as they see it. It's one small, preventative step that can do a lot of good.

- HO’s are typically not aware of responsibilities
- Avoid cycle of giving the HO’s the run around



# What does a successful stormwater asset management program look like?



- Knows the location and condition of all assets
- Develops strategies for stormwater complexities
- Aligns condition assessments and capital improvements with master plans
- Supports completion of systemwide master plans
- Coordinates with exist asset management practices
- Measures KPIs and increases efficiencies to reduce overall costs
- Alerts stakeholders about roles and responsibilities
- Educates customers during trouble calls and response opportunities

**But how do I  
fund my program?**





# Where are you starting?

No user fee?

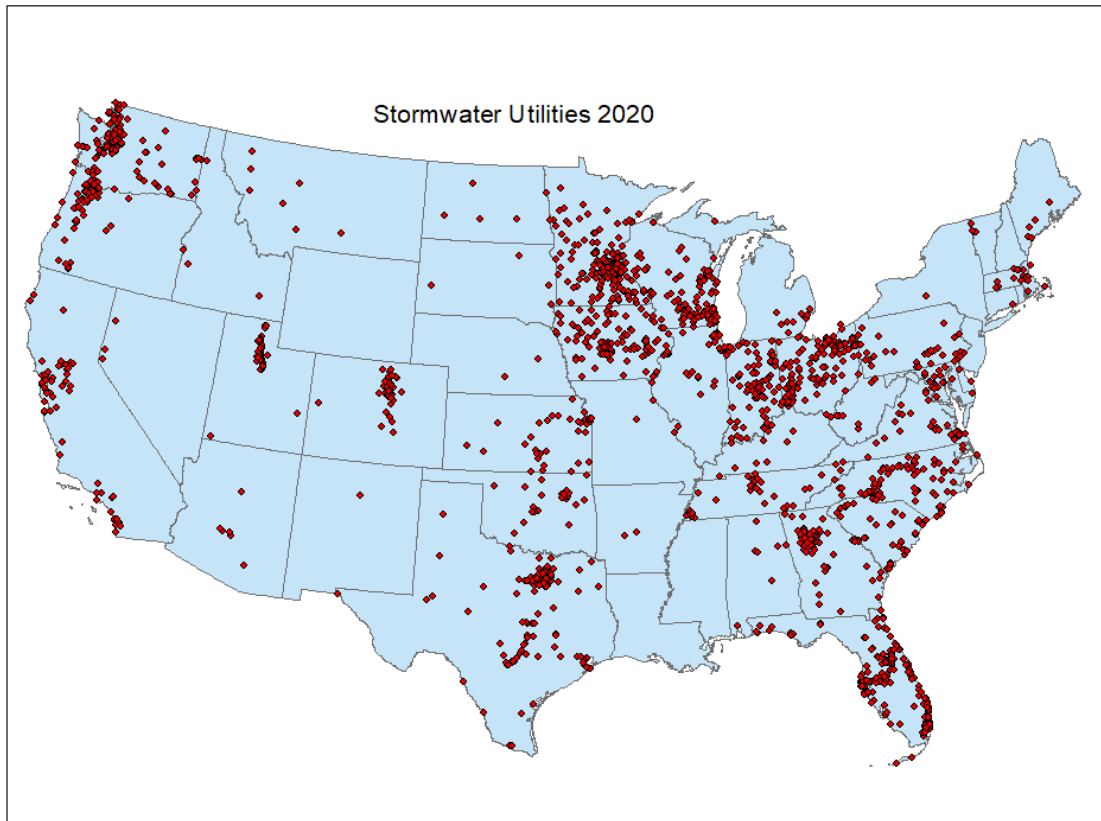
A fee in place but need updates?

A fee in place but cash-funding capital?

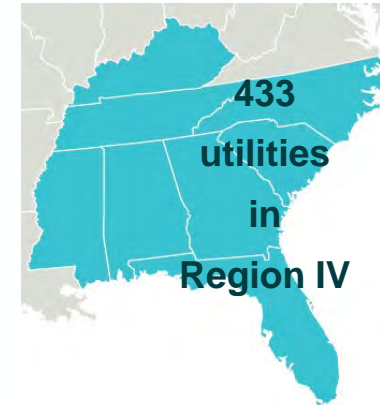
Using debt funding but need special options?



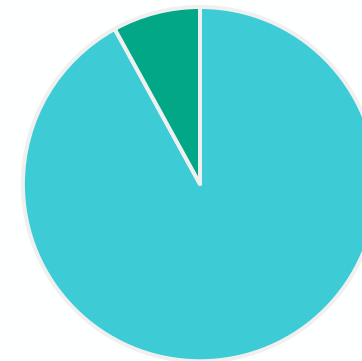
# Stormwater Utilities



## 220 WKU Survey



## Basis of Fee



■ Imp Area ■ Other

# Stormwater Utilities



A fair, equitable, and stable way to collect revenue



Sustainable funding strategy that promotes long-term financial planning

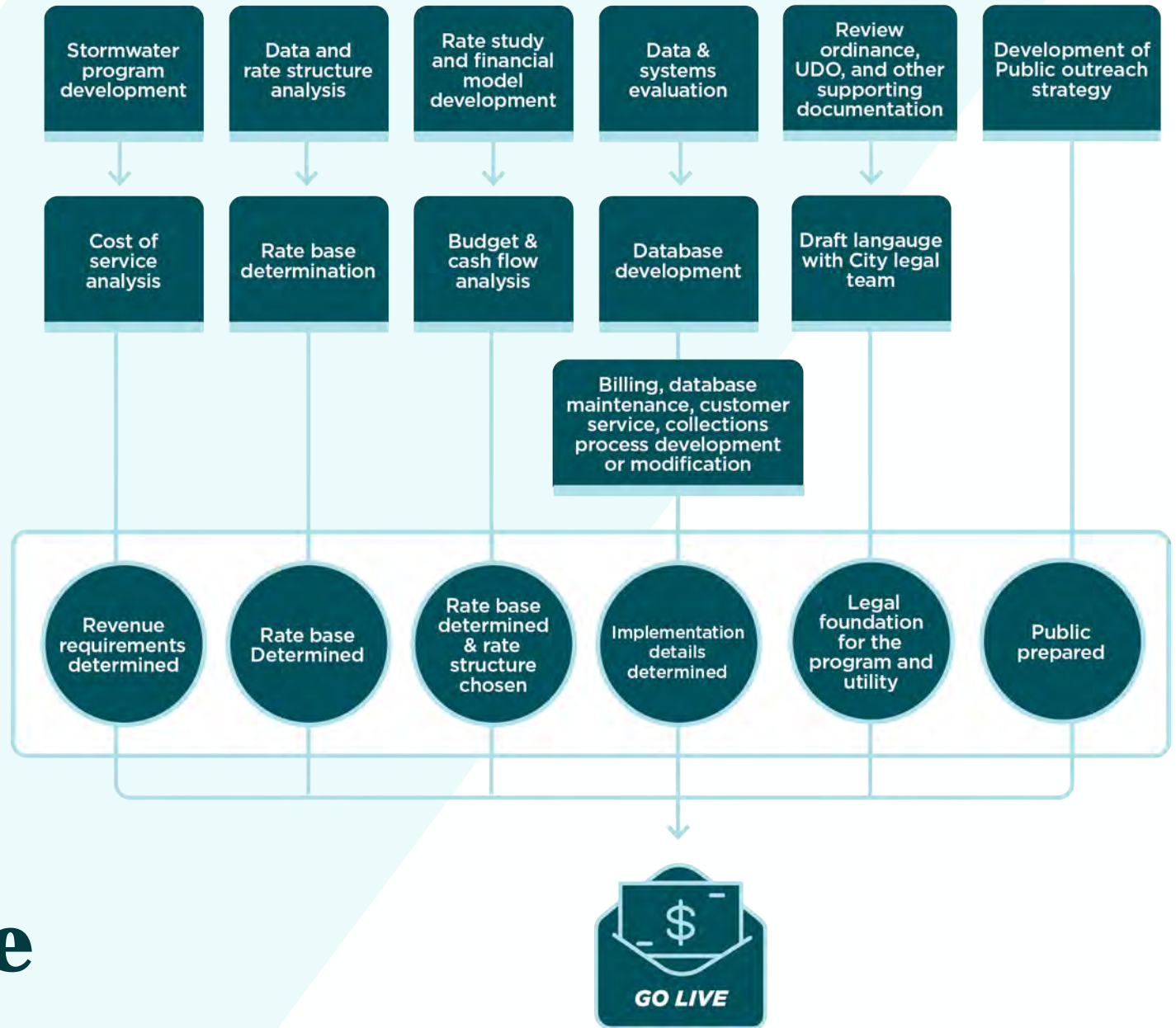


Mindful of need to increase revenues over time, minimize rate shocks, and account for future uncertainty regarding the regulations



Align the rate structure and credit program with goals of the stormwater program

# KEY ELEMENTS TO Developing a Successful Stormwater Fee



# Stormwater Fee Modernization



## Financial Planning

Determine increases needed



## Data Maintenance

Assess billing data accuracy and practices



## Rate Structure

Modernize and improve equity

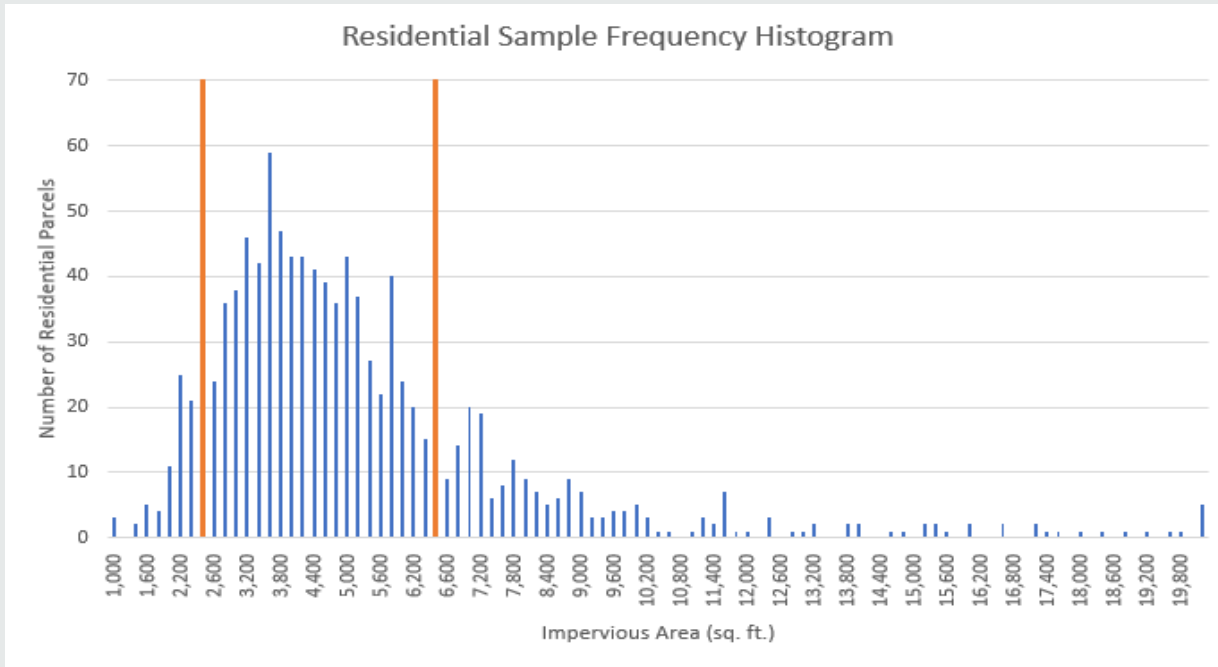


## Implementation

Use robust public process

# Rates and Rate Structure

- A rate plan - avoiding shocks
- Exploring rate structure alternatives



Single Family Residential Properties (SFR)



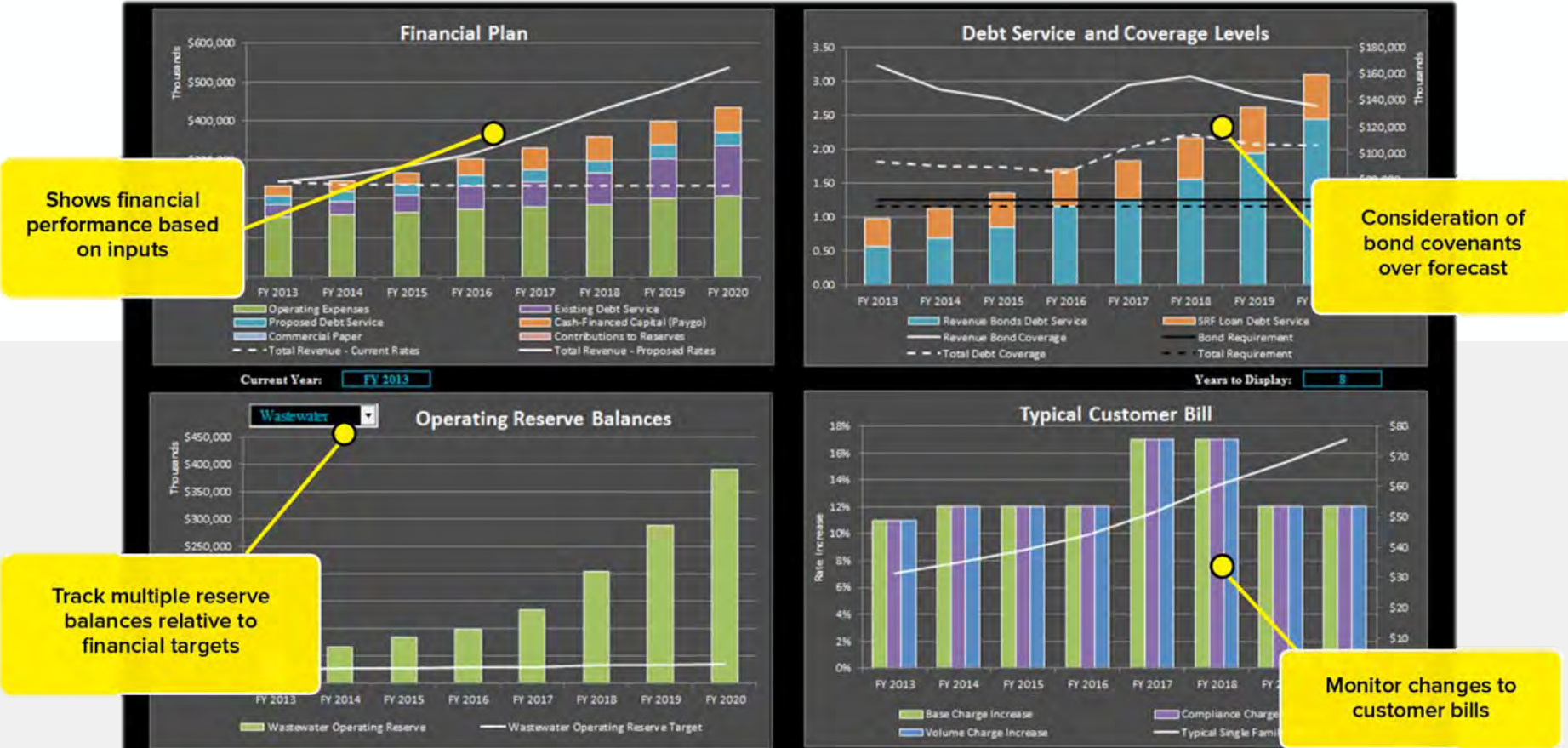
Non-Single Family Residential Properties (NSFR) - All other properties



Undeveloped Land



# Get Prepped for the Bond Market





# Getting Creative: Specialized Approaches



Revenue Bonds



Special Assessments



Tax Increment Financing



Replacement Funds



# Thank you!

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