



PREPARING FOR THE NEXT STORM – *Shelbyville Experiences in Stormwater Master Planning*

Chad McCormick, PE, CFM



Jennifer Herrell, PE, CFM

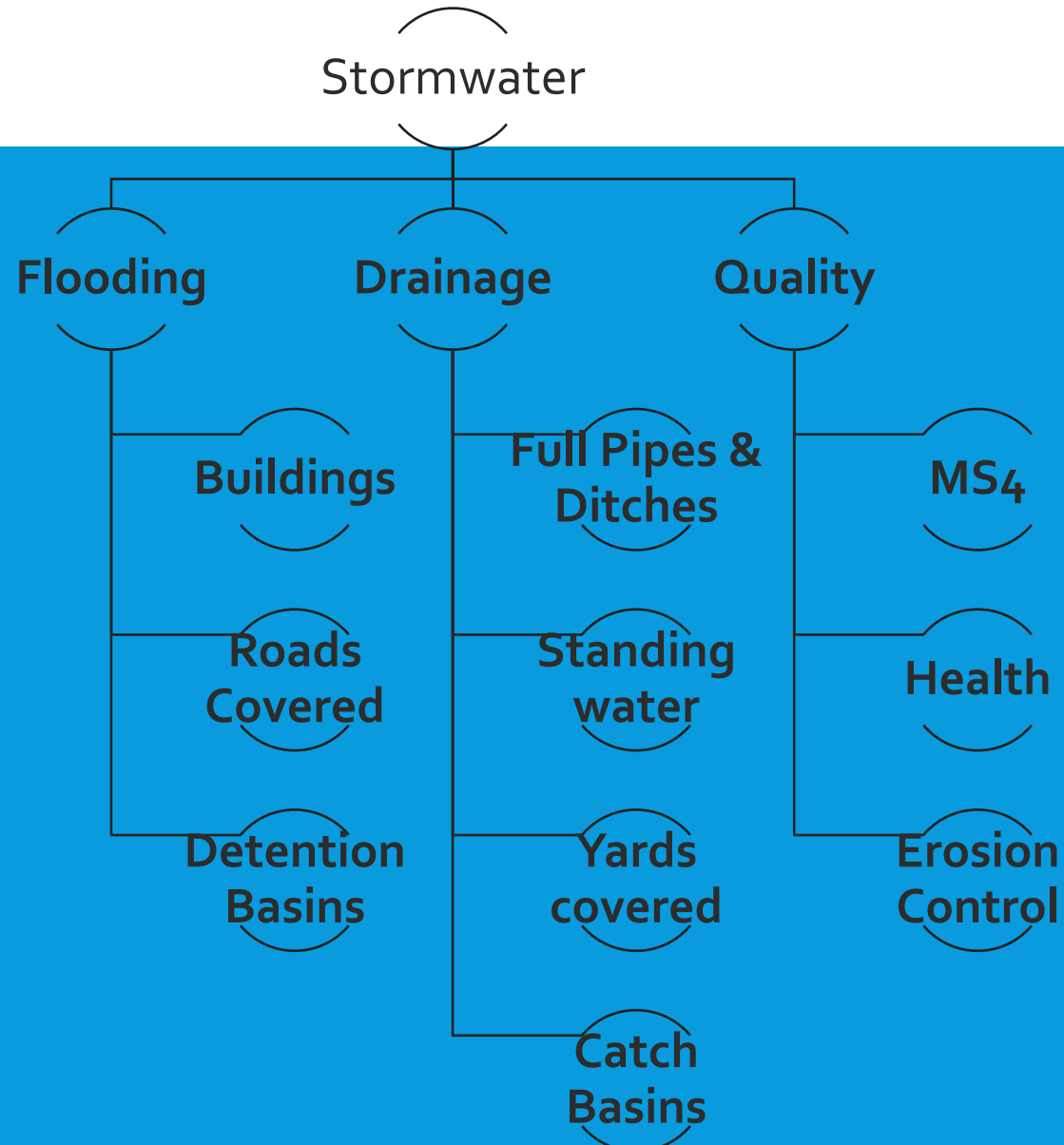


OVERVIEW



- “Shelbyville’s Storm”
- Selecting a Master Planning Process
- Public Involvement
- Level of Service
- Problem Identification & Prioritization
- Potential Costs
- Deciding on a Path Forward

STORMWATER COMPONENTS



MASTER PLANNING WHEEL



LEVEL OF SERVICE (LOS)

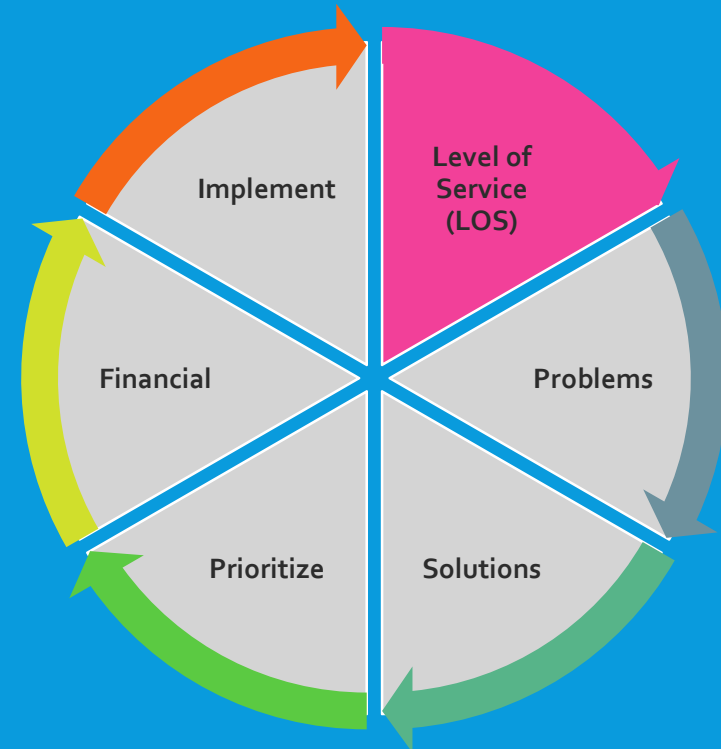


- **Services Performed (Not Performed)**

- Flood Control
- Drainage Improvements
- Nuisance Control

- **Influencers:**

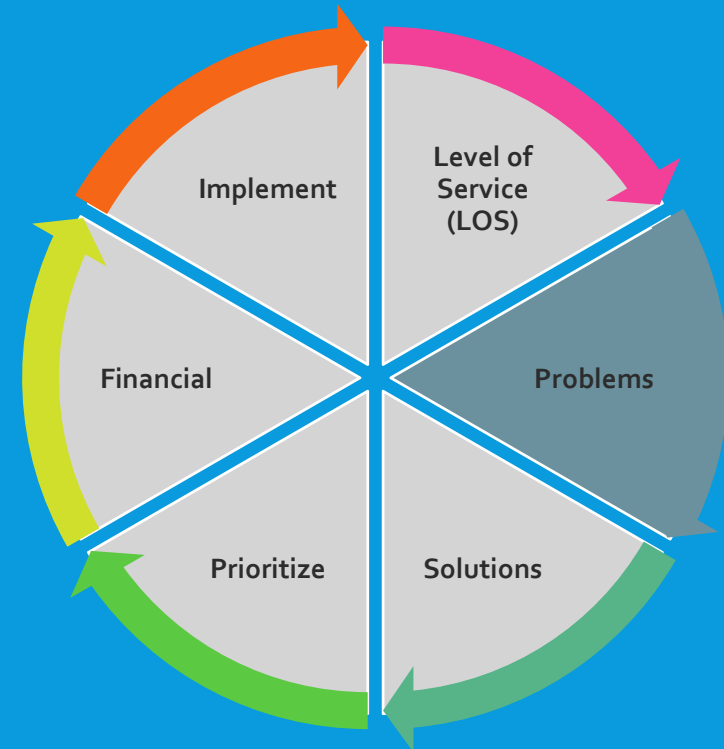
- Public Demand
- Regulatory Minimum
 - FEMA
 - EPA & KDOW
 - Local Ordinances
- Budgets
 - Operations
 - Capital

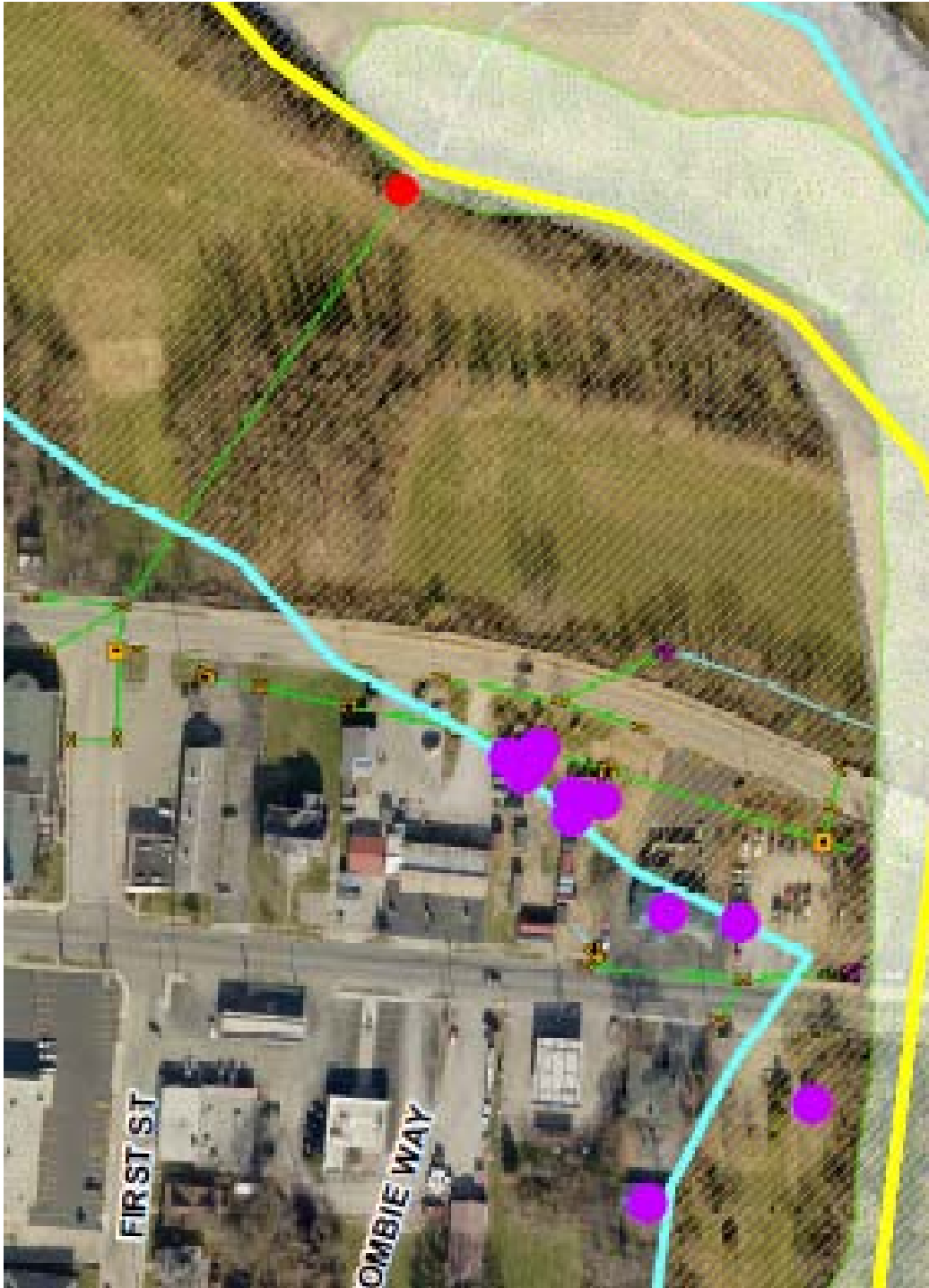


PROBLEMS



- **Input (Ongoing)**
 - Calls & Complaints
 - To: Mayor, Council & Public Works
- **Outreach (March 2016)**
 - Looking for Those that Don't Call
- **Inventory (2015 & 16)**
 - "Compile the List"
 - Field Assessment
- **Study (future)**
 - Survey
 - Concept Calculations
 - Model





1% FLOODPLAIN



- ▶ Several Properties Next to:
 - ▶ Clear Creek
 - ▶ Meadow Run
 - ▶ Weissinger Road
 - ▶ Creekside Road
 - ▶ Two Spring Dr
- ▶ Need Flood Insurance
- ▶ May or May Not Include Buildings

FLOODING VS DRAINAGE





STORMWATER MASTER PLAN – INVENTORY STAGE



- Over 100 Stormwater Concern Locations
- Field Verified 2015 & 16

CURB INLETS (*OVER 120*)



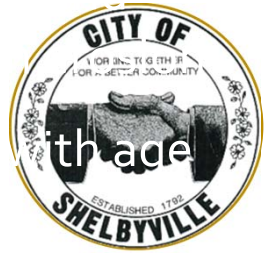
CURB INLETS (OVER 120)



ERODING DITCHES & CHANNELS



- ▶ Rip Rap or Other Lining Damaged or Needs Replacement
- ▶ Cross – Utilities Exposure
- ▶ Sediment Source – Pollution
- ▶ Potential for Property Exposure



nt

SINKHOLES



- ▶ A depression that doesn't have somewhere to drain away
- ▶ Often filled with large stone
- ▶ Slowly drain

POND MAINTENANCE



- ▶ Mowing
- ▶ Debris Clearing
- ▶ Outlet Structure Repair & Replacement
- ▶ Impoundment / Dam Inspection & Maintenance

POND OUTLET REPAIRS



- ▶ Undermined
- ▶ Potential catastrophic failure
- ▶ Dam Breach

NEIGHBOR DRAINAGE



- ▶ Usually Small
Diversion Necessary
- ▶ Common
Connections between
Neighbors
- ▶ Usually Above the
City Drainage System



STORMWATER MASTER PLAN – OUTREACH (PUBLIC MEETINGS)

- March 22 & 29, 2016
 - City Hall
 - Fire House #2
- Opportunities:
 - See Known Problems
 - ID New Problems
 - Gauge Interest
 - Inform Council



PROBLEM INVESTIGATIONS - APPLICABILITY



Applicability / Access	
Private Property	70
City Drainage System	79
County Drainage System	19
KYTC Drainage System	14
Drainage Easement	51

PROBLEMS

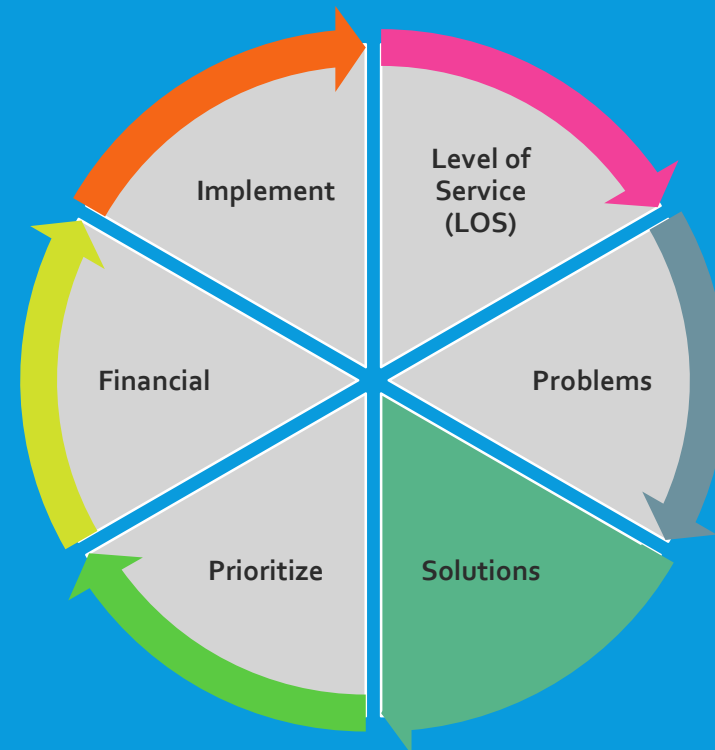
- Dominated by Drainage
- Few Flash Flooding
- Fewer Structure Flooding
- Detention Basin Maintenance
- Many Catch Basins
- Many Outside City LOS

Problem Identification	
Flash Flooding (1-3hrs)	15
Flooding (buildings, basements, roads)	17
Catch Basin Failure	~120
Structural Failure	9
Neighborhood Culvert / Channel System	16
Nuisance Drainage (no- structure flooding)	30
Frequent Standing Water	29
CMP Invert Failure	0
Detention Basin O&M	25
Aesthetics or Vectors	9
Maintenance Frequency	
One Time	39
Ongoing	0
~ Annually	19
~ 3-5 years	14
~ with rain events	0

SOLUTIONS



- Design Concept
 - Schematic
 - Basic Approach
 - Establish or Upsize Pipes
 - Routine Maintenance
- Options
 - Convey
 - Storage
 - Maintain
- 1st Step
 - Study (survey, calculate or model)
 - Design & Construct



LEVEL OF SERVICE (LOS) GAP FINDINGS



1st Regulatory Mandates

- FEMA

- Flood Control Requirements
- Program Oversight
- Community Rating System



✓ - PE, CFM on Staff
Not Participating

- EPA / KDOW

- MS₄ Stormwater Quality

✓ - Recovering

- Local Ordinances



- Programmatic

✓ - Running short

LOS GAP FINDINGS



2nd Flood Control and Drainage

- Emergency Preparedness 100-yr / 1% Flood
 - Clear Creek Primary Flood Zone
 - Primary Roads at or above 1% Flood Level
- Emergency Action Plans
 - Lake Shelby Dam
 - Mary Ross Lake Dam
- Property Flooding
 - 45 with Structures Close or in Floodplain
- Nuisance Drainage
 - No Structures Flooded

✓ - Mapped
11 - road closures
Getting Old

Many areas

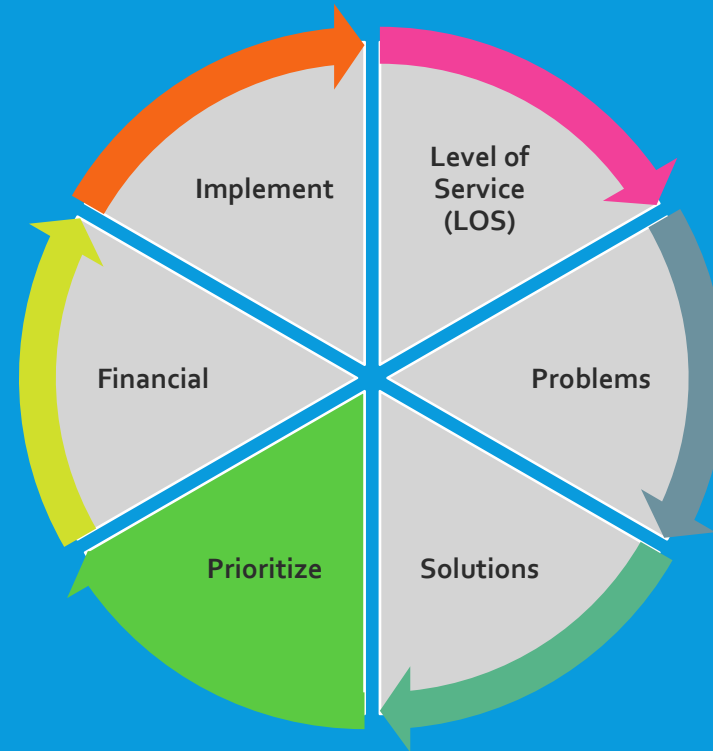
PRIORITIZE



1st Regulatory Mandates

2nd Flood Control and Drainage

- Benefit / Cost Ratio
- Benefits – Weighted Quantity
- Cost – Conceptual



BENEFIT CALCULATION



Critical Infrastructure (highest value per the appropriate category)	
<i>Emergency Operations</i>	200 - Impacting or at an Emergency Operations Facility
<i>Schools (or Special Bldg)</i>	200 - Impacting School (or Special Building: Day Care, Rest Home,
<i>Major Arterial and Critical Roads</i>	150 - Solution meets Goal LOS 75 - Solution Assists meeting Goal LOS by 50% or less
<i>Minor Arterial Roads</i>	100 - Solution meets Goal LOS 50 - Solution Assists meeting Goal LOS by 50% or less
<i>Collector & Subdivision Roads</i>	75 - Solution meets Goal LOS 25 - Solution Assists meeting Goal LOS by 50% or less
Structure Flooding	
<i>Number of Structures or Properties Impacted</i>	100 - Structures in SFHA (_____ *100) 75 - Structures Impacted by Flash or Small Storms (_____ * 75)
Customer Service	
<i>Number of Properties Involved or Customer Service Comments Resolved</i>	100 - 31+ properties 50 - 11 to 30 properties 25 - 1 or 10 properties
Stormwater Quality	
<i>TMDL or Wetland</i>	50 - In or U/S of 303(d) Listed Reach or Wetland
<i>Erosion / Sedimentation</i>	25 - Site or Stream Bank
<i>Standing Water</i>	25 - Mosquito Problem
Constructability	
<i>City Maintenance Crews</i>	50 - 1 to 5 Crew Days 25 - 6 or More Crew Days
SUBTOTAL BENEFIT SCORE	
Other Constructability FACTORS	
<i>Permitting, utility conflicts, easement acquisition, etc.</i>	+25% - No / Very Few Known Constructability Issues 0% - Some Known Issues -25% - Major Issues known or Expected <input type="checkbox"/> Road Closure <input type="checkbox"/> Large Trees <input type="checkbox"/> UIC / Sinkhole <input type="checkbox"/> Property Acquisition <input type="checkbox"/> Easement Acquisition <input type="checkbox"/> Wetlands <input type="checkbox"/> Slip Lining or Boring <input type="checkbox"/> Water/Sewer/Utility Conflict <input type="checkbox"/> KYTC/KDOW/EPA/COE Permitting or Mitigation

- Weighted
- Critical Infrastructure
- Structure Flooding
- Customer Service
- Stormwater Quality
- Constructability
- Benefit to Cost Ratio

FINANCIAL



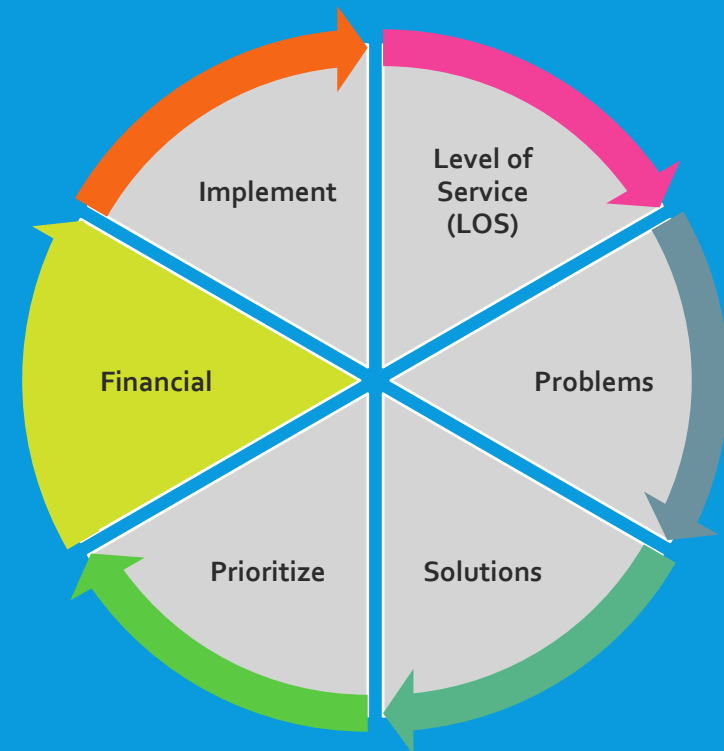
- What Services will Performed (Not Performed)

- Flood Control
- Drainage Improvements
- Nuisance Control

- Easement Planning & Management

- Influencers:

- Public Demand
- Regulatory Minimum
 - FEMA
 - EPA
 - KDOW
- Budgets



CONCEPTUAL COST ESTIMATES



- **Conceptual Construction**
 - Next Step (study or model)
 - Routine or Reoccurring
 - Up to Five Years
- **Standardized Unit Costs**
 - KYTC
 - Louisville MSD
 - Private Construction Survey

COST ESTIMATES - LEVEL OF SERVICE



Solutions Cost (<i>all</i>)	\$ Estimate ^{*(2016 \$)}	
	All Projects	City LOS Projects
Design & Construction or One-time Cost	\$5,554,700	\$3,987,000
Ongoing / Year 1	\$637,000	\$521,000
Ongoing / Year 2	\$473,000	\$406,000
Ongoing / Year 3	\$553,000	\$417,000
Ongoing / Year 4	\$473,000	\$406,000
Ongoing / Year 5	\$627,000	\$491,000

IMPLEMENT



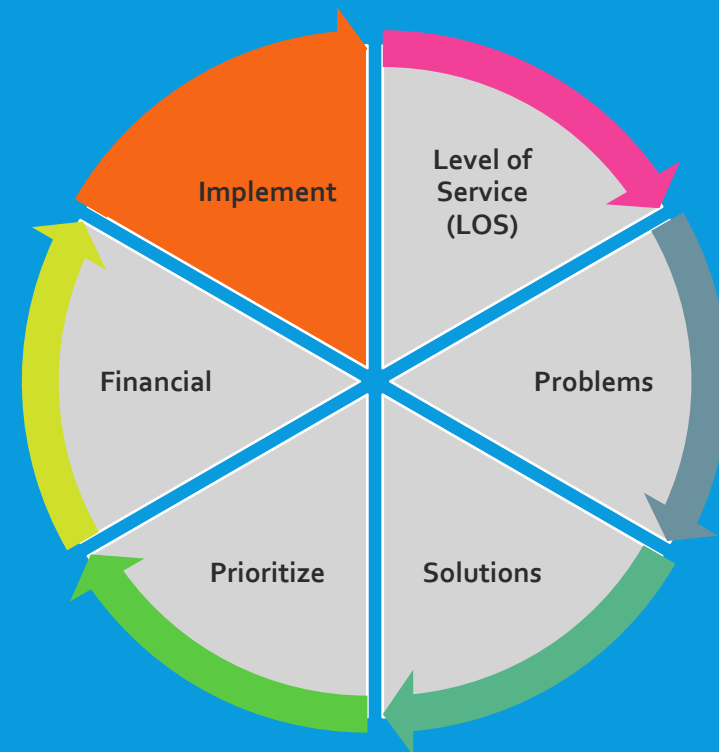
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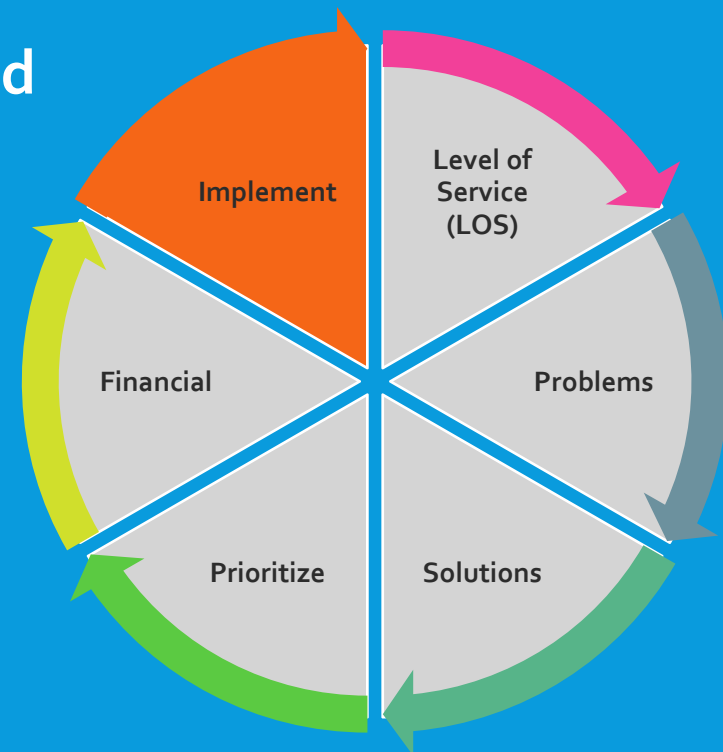
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IMPLEMENT - SCHEDULE



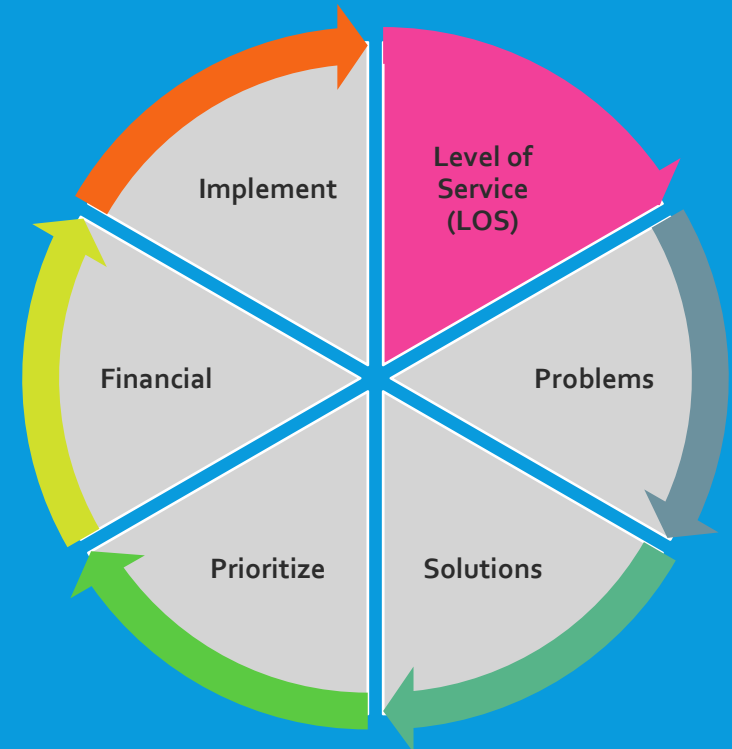
- Typical 1, 5, 10 and 20 Year Goals
- Listed Projects Completed
- New Projects will continually be added
- Some Projects / Services are Annual



LEVEL OF SERVICE (LOS)



- Reassess (update every 2-5yrs)
 - Regulatory Demands
 - Public Expectations
 - Capabilities and Resources
 - Old Problems
 - New Problems
- Annual Budget Process
- Periodic Update

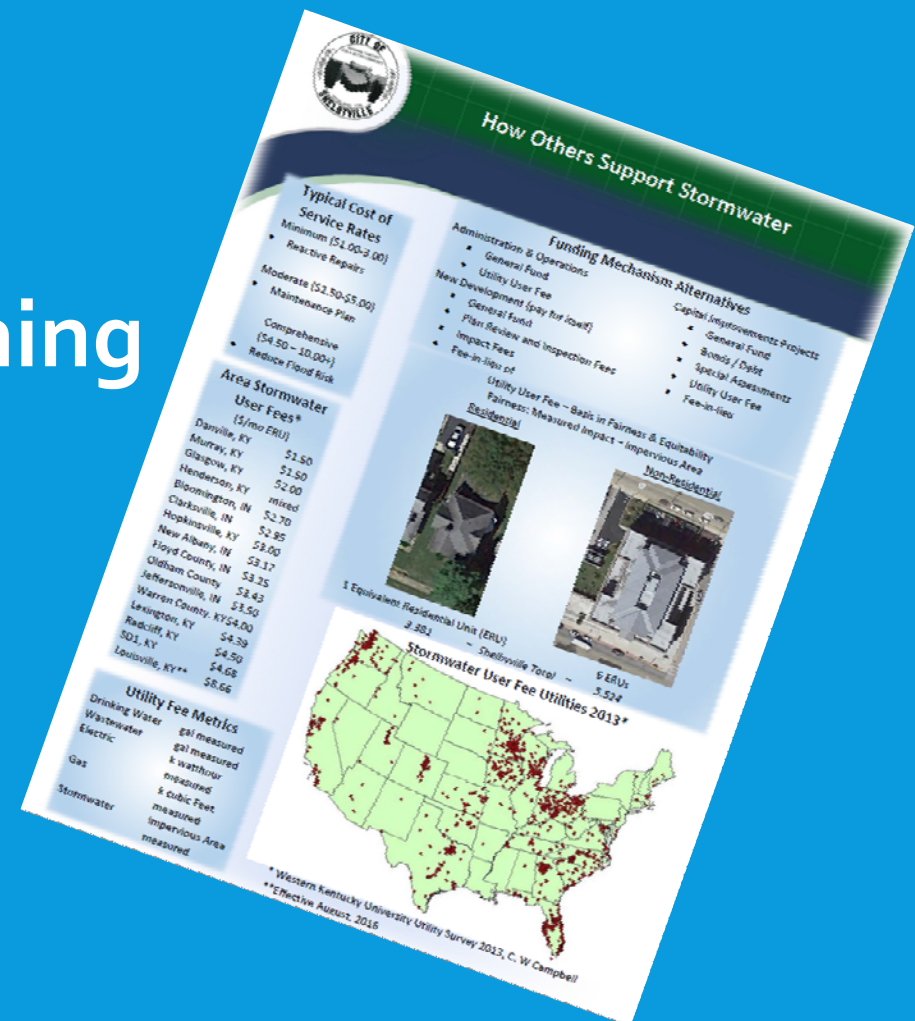


NEXT STEPS ... DECIDE



• Council Workshops

- IF want to do something
- WHAT is to be done
- WHEN want it
- HOW to pay for it



THANK YOU



Chad McCormick, PE, CFM

mccormick@ldd-inc.com

(502) 426-9374



Jennifer Herrell, PE, CFM

jpherrell@mw.twcbc.com

(502) 633-1094