

CIP 2024

CIP Development, Funding & Approval

Part 1: Project Prioritization

Part 2: CIP 2021 Definition

Part 3: Funding

Part 4: Governing Authority Approval

Department of Watershed Management

March 01, 2024



AGENDA

01 BACKGROUND	Process and Committee role, SharePoint
02 PPM02	Process definition
03 PROJECTS	Project Sheets
04 CRITERIA	Tables 3.1 and 3.2
05 SCORING	Master Spreadsheet
06 ASK	What, who and when?

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*Photo: Peachtree Industrial Blvd Water
Main Break 2022*

CIP 2024 DEVELOPMENT

Continuing best practice planning that ensures responsible management, oversight and accountability.

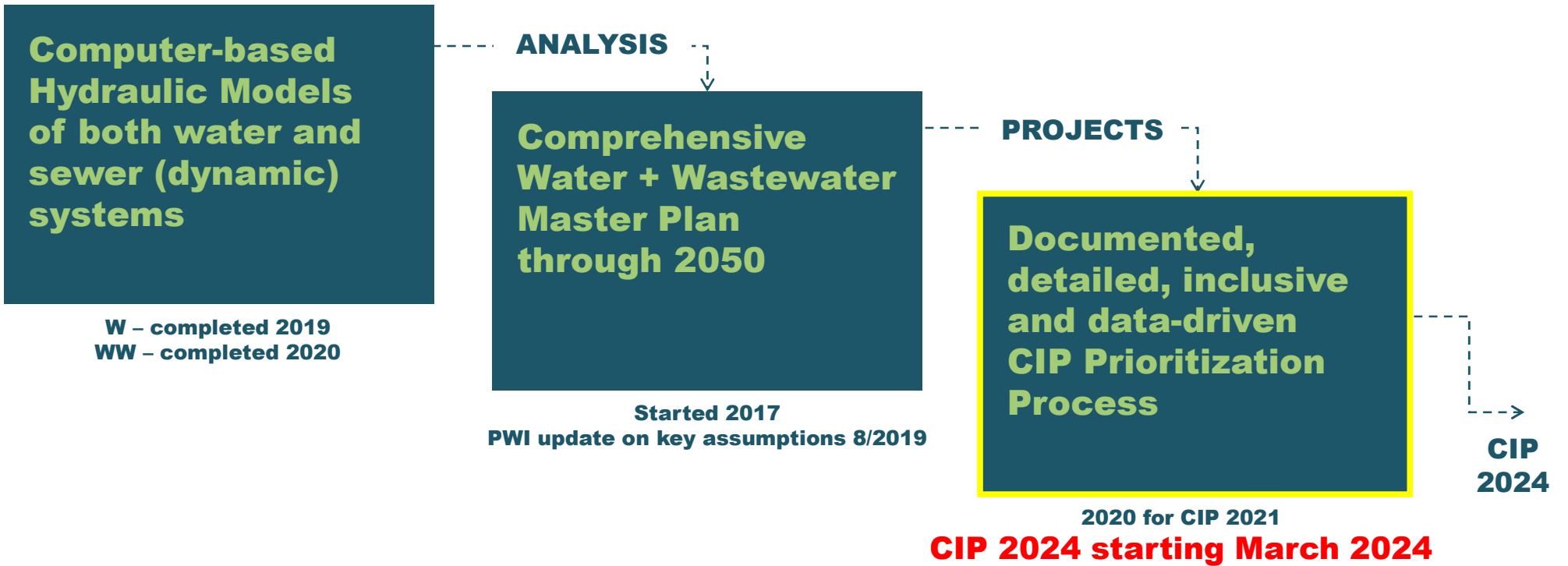
*Photo: AJC October 6, 2017
Snapfinger Creek near Eagle's Beek Circle*





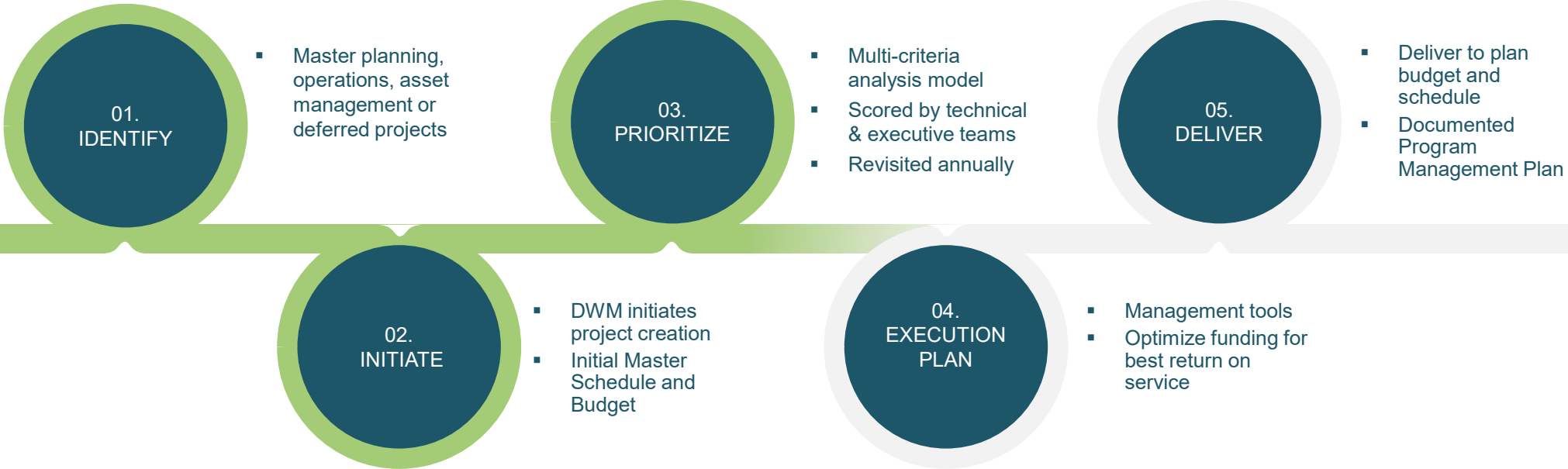
CIP 2021 ESTABLISHED PROCESSES

*STATE-OF-THE-ART TOOLS ALLOW
BEST-PRACTICE PLANNING & PRIORITIZATION*





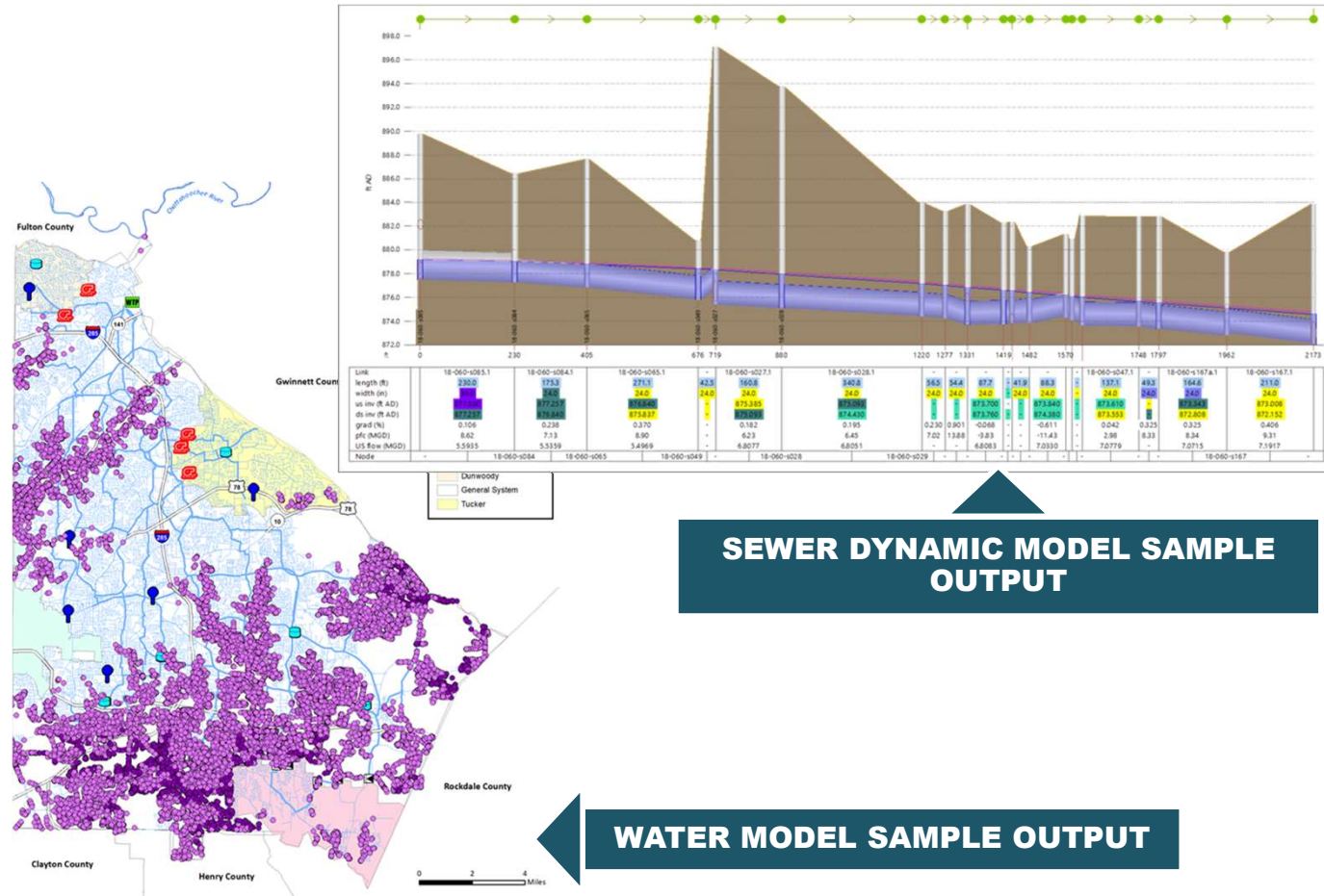
CIP LIFECYCLE



COMPUTER-BASED HYDRAULIC MODELS

Allowing new levels of understanding of the performance of DWM's W/WW systems:

- ▶ Identify & troubleshoot system issues
- ▶ Evaluate and compare alternative future scenarios
- ▶ Compare costs and benefits of different servicing solutions



SEWER DYNAMIC MODEL SAMPLE OUTPUT

WATER MODEL SAMPLE OUTPUT



DWM's FIRST WATER & SEWER MASTER PLANS

Completed 2020

- ▶ Strategic planning for 2020-2050, with view to 2070
- ▶ Project future demand levels based on best-practice projections of future population and employment
- ▶ Develop and evaluate servicing alternatives to meet future demand
- ▶ CIP 2021 was, and CIP 2024 is the short-view, 10-year, action plan of the Master Plan.

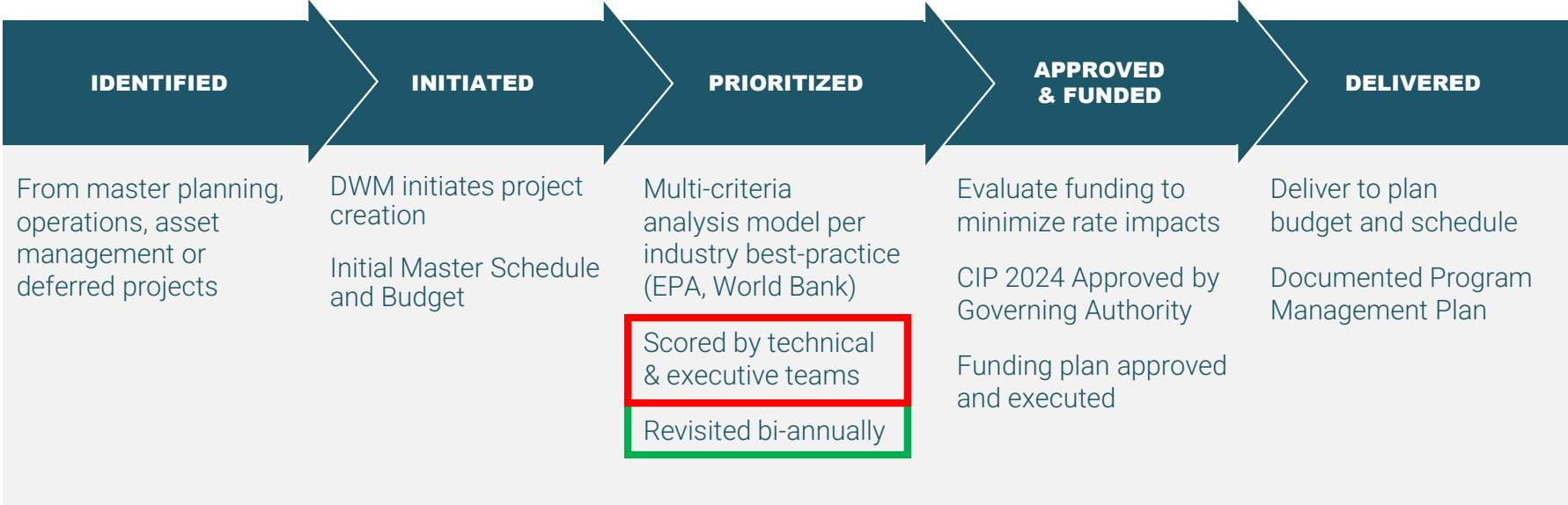
STAKEHOLDER INVOLVEMENT

- DeKalb County Executive
- DeKalb County Board of Commissioners
- DWM Project Management Teams
- DWM Leadership
- Technical Committee (DWM technical, operational and CDPMT staff)
- Steering Committee (incorporated cities and local agencies in DeKalb County – MARTA, DMA)
- Other DeKalb County department leadership and support staff (Planning, Fire Rescue)
- Regional and state agencies (consultation regarding permit requirements)



DATA-DRIVEN, BEST-PRACTICE PRIORITIZATION PROCESS

Projects are:

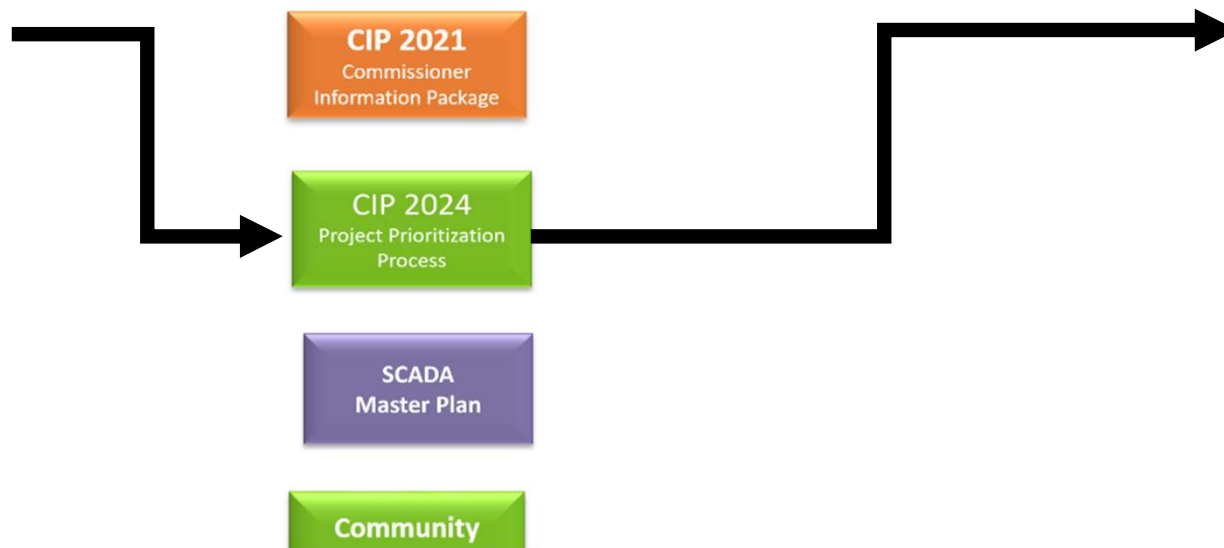


SHAREPOINT

DEFENSIBLE + REPRODUCIBLE

All use common tools for file storage:

- ▶ <https://dekalb.sharepoint.com/sites/DWMCIP/CIPPM/SitePages/Home.aspx>



CIP 2024
Project Prioritization
Process

Water Treatment
Project Sheet

Water Distribution
Project Sheet

Wastewater Collection
Project Sheet

Wastewater Treatment
Project Sheet

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01 BACKGROUND Process and Committee role, SharePoint

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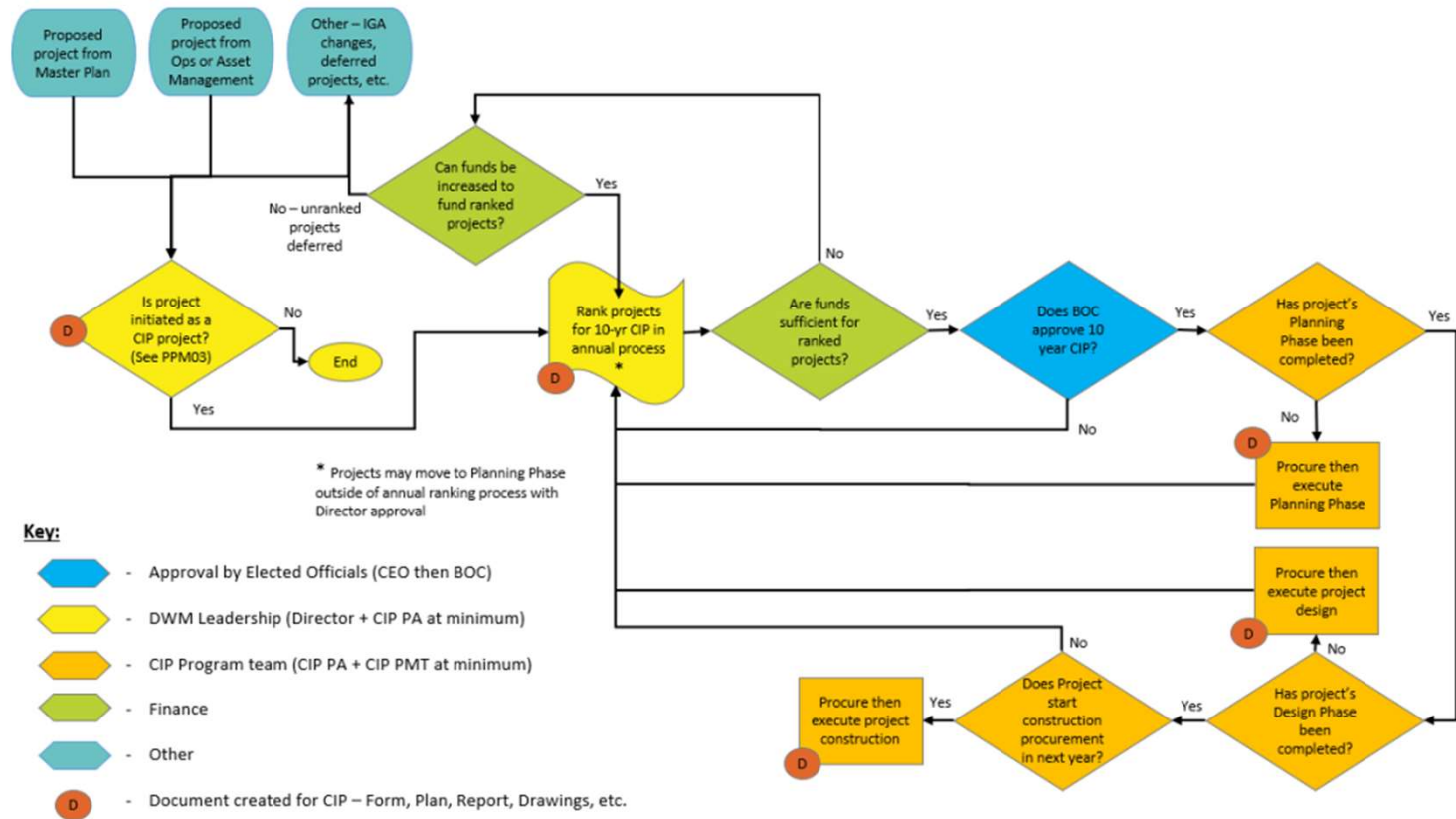
04 CRITERIA Tables 3.1 and 3.2

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PROJECT PRIORITIZATION

- Every second-year process – PPM02 – Figure 2.1



PROJECT PRIORITIZATION

- ▶ **Multi-criteria tool** allows competing priorities to be systematically evaluated by a **broad group of stakeholders**
- ▶ 44 water and 105 wastewater projects identified to meet level of service, prioritized and ranked - with ~80% in **CIP 2021**
- ▶ In **CIP 2024**, there are 50 water and 53 wastewater projects prioritized and ranked - with an additional 47 projects falling outside the 10-year window

FACTORS	FACTOR WEIGHT	CRITERIA	CRITERIA WEIGHT
COMPLIANCE	50%	Water Quality / Surface Water Quality	5%
		Tighten of System	5%
		Public Health & Safety	30%
		Regulatory Compliance	30%
		Resilience	30%
FINANCIAL	20%	Cost Recovery	25%
		Reduction of Operational Cost	25%
		Concurrence w/ Other CIP Projects	25%
		Life Extension of Asset	25%
SOCIAL & ENVIRONMENTAL STEWARDSHIP	30%	Employment (More Jobs)	10%
		Economic Growth / Development (Social Justice)	30%
		Quality of Life / Customer Satisfaction	30%
		Impacts to Natural Resources	10%
		Energy Efficiency Lower Carbon Footprint	20%



INDUSTRY STANDARD PRACTICE

- ▶ Multi-criteria decision analysis tools are industry best-practice for the evaluation and ranking of projects

PROMOTED BY AGENCIES SUCH AS

- ▶ U.S. Environmental Protection Agency (EPA) as part of their “Integrated Planning Framework”
- ▶ The World Bank’s “Infrastructure Prioritization Framework” recommends a multi criteria approach with social-environmental and financial-economic criteria considered

Renewal and replacement of aging infrastructure has been the #1 issue facing the water industry for eight years running.

American Water Works Association, 2020

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PROJECTS DEFINED & SCORED

DWM CIP Program - Project Information 

Project Manager: _____

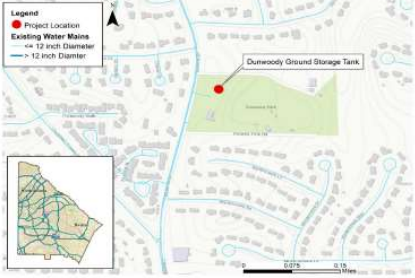
Project Name	Project Number	Proposed Planning Budget	Date Created	Commissioner District	Project Manager
Dunwoody Ground Tank Replacement	W - DS GT01	\$6,733,000		XXXXX	
Design Schedule (anticipated)					
Duration	100% Design Submittal		Bid Document to P&C		
Procurement Schedule (anticipated)					
Advertisement	Pre-Proposal Conference	Proposal Opening	BOC Date	NTP	
Design Schedule (anticipated)					
Duration Days	Substantial Completion		Final Completion		


Description
 10 ft of 8-inch Water Main
 8-inch FCV and valve vault
 Dunwoody Existing Ground Tank Decommission
 Dunwoody Ground Storage Tank - 1 x 3 MG GST

Implementation Considerations
 implementation Considerations test

Details
 details test

Benefits
 benefits test



 **DWM Project Prioritization CIP Program**

Project Name
Dunwoody Ground Tank Replacement

Overall Score
3.3/5

Class	Criteria	Score	Justification
Environmental	Drinking Water Quality	Low	
	Leak Reduction	Medium	
	Energy Efficiency	Medium	
	Impact to Natural Resources	Medium	
	Permittability/ Regulatory Complexity	Medium	
Financial	Revenue Generation	Medium	
	Reduction of Operational Cost	Medium	
	Concurrence with Other CIP Projects	Medium	
Social	Employment (Job Creation)	Medium	
	Supporting Growth & Development	Medium	
	Quality of Life/Customer Satisfaction /Resilience	High	
	Public Health/Safety (Fire Protection)	High	

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PROJECTS DEFINED & SCORED

Preliminary Ranking Scores for Proposed Water System Capital Improvement Projects (2020-2050)

ID	Horizon	Project	C					Financial				E					Total	Rank	Cost
			C1	C2	C3	C4	C5	F1	F2	F3	F4	E1	E2	E3	E4	E5			
			Water Quality/Surface Water Quality	Tightness of System	Public Health and Safety	Regulatory Compliance	Resilience	Cost Recovery	Reduction of Operational Cost	Concurrence with other CIP Projects	Life Extension of Asset	Employment (more jobs)	Economic Growth/Development (Social Justice)	Quality of Life/Customer Satisfaction	Impacts to Natural Resources	Energy Efficiency Lower Carbon Footprint			
WT001A	2030	Clearwell and Hub Service Pump Station Upgrades - Phase A	0.15	0.15	1.50	1.50	1.50	0.75	0.75	0.25	1.25	0.50	1.50	1.50	0.50	1.00	4.50	1	\$76,950,000
T001A	2030	60-inch Transmission Loop - Phase A & Northlake 60-inch Transmission Main	0.25	0.15	1.50	0.90	1.50	1.25	1.25	1.25	0.25	0.50	1.50	1.50	0.30	1.00	4.39	2	\$146,500,000
ET02	2030	Avondale Elevated Storage Tank Replacement and 36-inch Transmission Main	0.25	0.15	1.50	0.90	1.50	0.25	1.25	1.25	0.75	0.50	1.50	1.50	0.50	1.00	4.35	3	\$16,250,000
WT004	2030	Supervisory Control and Data Acquisition (SCADA) Short-Term Improvements	0.25	0.25	0.90	1.50	1.50	1.25	1.25	1.25	0.30	0.30	1.50	0.50	1.00	4.12	4	\$1,250,000	
WM001	2030	Water Main Replacement (Local Hydraulic and Risk-Based) - WM001	0.15	0.25	1.50	0.30	1.50	1.25	1.25	0.75	1.25	0.30	0.90	1.50	0.50	0.60	3.89	5	\$275,000,000
TM002A	2030	PCCP Transmission Main Replacement Phase A (Gardendale)	0.25	0.25	1.50	0.90	1.50	0.75	0.75	0.75	1.25	0.30	0.30	1.50	0.50	0.60	3.86	6	\$13,398,000
TM002B	2030	PCCP Transmission Main Replacement Phase B (Arundale)	0.25	0.25	1.50	0.90	1.50	0.75	0.75	0.75	1.25	0.30	0.30	1.50	0.50	0.60	3.86	6	\$20,328,000
TM01	2030	Peachtree Industrial Blvd 36-inch Transmission Main Replacement	0.15	0.25	1.50	0.90	1.50	0.75	0.75	0.75	1.25	0.30	0.30	1.50	0.50	0.60	3.83	8	\$16,987,000
WT002	2030	Water Treatment Plant Power Resilience	0.15	0.15	1.50	0.90	1.50	0.25	0.25	0.75	0.25	0.50	1.50	1.50	0.30	0.60	3.72	9	\$10,450,000
RW03	2030	Emergency Drought Response Implementation Plan	0.15	0.15	1.50	1.50	1.50	0.25	0.25	0.75	0.75	0.30	0.30	1.50	0.30	0.60	3.70	10	\$450,000
G001A	2030	Whites Mill Ground Storage Tank and Pump Station Replacement	0.15	0.15	1.50	0.90	1.50	0.75	0.75	0.75	0.25	0.30	0.90	0.90	0.30	0.60	3.50	11	\$12,320,000
G001B	2030	Columbia Ground Storage Tank and Pump Station Replacement	0.15	0.15	1.50	0.90	1.50	0.75	0.75	0.75	0.25	0.30	0.90	0.90	0.30	0.60	3.50	11	\$12,697,000
P203	2030	Dunwoody Pressure Zone Realignment	0.25	0.15	1.50	0.90	1.50	0.75	0.75	0.75	0.25	0.30	0.90	0.30	1.00	3.49	13	\$800,000	
WT003A	2030	Ozone Generator Replacement - Phase A	0.25	0.15	1.50	1.50	1.50	0.25	0.25	0.25	0.25	0.30	0.30	1.50	0.50	0.20	3.43	14	\$8,960,000
P202	2030	Tucker Pressure Zone Expansion (Phase 1)	0.15	0.15	1.50	0.90	1.50	0.25	0.25	0.75	0.25	0.30	0.90	1.50	0.30	0.60	3.42	15	\$180,000
VL02	2030	Urbionia Fill Valve Replacement	0.25	0.15	1.50	1.50	0.30	0.25	1.25	0.75	1.25	0.30	0.30	0.90	0.30	1.00	3.33	16	\$340,000
VL04	2030	Wesley Chapel Fill Valve Replacement	0.25	0.15	1.50	1.50	0.30	0.25	1.25	0.75	1.25	0.30	0.30	0.90	0.30	1.00	3.33	16	\$340,000
VL05	2030	Columbia Fill Valve Replacement	0.25	0.15	1.50	1.50	0.30	0.25	1.25	0.75	0.75	0.30	0.30	0.90	0.30	1.00	3.23	18	\$330,000
VL06	2030	Redan-Panola Fill Valve Replacement	0.25	0.15	1.50	1.50	0.30	0.25	1.25	0.75	0.75	0.30	0.30	0.90	0.30	1.00	3.23	18	\$340,000
TK12	2030	Briarcliff 24-inch Transmission Main	0.15	0.15	1.50	0.30	1.50	0.25	0.25	0.75	0.25	0.30	0.90	1.50	0.30	0.60	3.18	20	\$1,090,000
VL03	2030	Tucker Fill Valve Replacement	0.25	0.15	1.50	1.50	0.30	0.25	1.25	0.75	0.25	0.30	0.30	0.90	0.30	1.00	3.13	21	\$300,000
VL07	2030	Dunwoody Fill Valve Replacement	0.25	0.15	1.50	1.50	0.30	0.25	1.25	0.75	0.25	0.30	0.30	0.90	0.30	1.00	3.13	21	\$60,000
WT005	2030	Long-term Residual Solids Management Study	0.25	0.25	0.90	0.90	0.90	0.75	0.75	0.75	0.25	0.30	0.30	0.30	0.50	0.60	2.64	23	\$250,000
RW04	2030	Short-term Drought Response Implementation Plan	0.15	0.15	0.30	1.50	1.50	0.25	0.25	0.75	0.75	0.30	0.30	1.50	0.30	0.60	2.44	24	\$270,000
VL01	2030	Wesley Chapel 20-inch and 24-inch Check Valves	0.25	0.15	0.90	0.90	0.30	0.75	0.75	0.75	0.25	0.30	0.30	0.90	0.30	0.60	2.43	25	\$70,000
T001B	2035	60-inch Transmission Loop - Phase B	0.25	0.15	1.50	0.90	1.50	1.25	1.25	1.25	0.25	0.50	1.50	1.50	0.30	1.00	4.39	26	\$129,680,000
ET01	2035	Charmont Elevated Storage Tank Replacement	0.25	0.15	1.50	0.90	1.50	0.25	1.25	1.25	0.25	0.50	1.50	1.50	0.30	1.00	4.39	27	\$1,090,000
WT006A	2035	Supervisory Control and Data Acquisition (SCADA) 2030 Technology Upgrade	0.25	0.25	0.90	1.50	1.50	1.25	1.25	1.25	0.75	0.30	0.30	1.50	0.50	1.00	4.12	28	\$1,250,000
WM002	2035	Water Main Replacement (Local Hydraulic and Risk-Based) - WM002	0.15	0.25	1.50	0.30	1.50	1.25	1.25	0.75	1.25	0.30	0.90	1.50	0.50	0.60	3.89	29	\$275,000,000
TR02	2035	N. Shallowford 30-inch Transmission Main	0.15	0.15	1.50	0.90	1.50	0.25	1.25	0.75	0.25	0.50	1.50	1.50	0.30	1.00	3.86	30	\$16,940,000
TM002C	2035	PCCP Transmission Main Replacement Phase C (Church)	0.25	0.25	1.50	0.90	1.50	0.75	0.75	0.75	1.25	0.30	0.30	1.50	0.50	0.60	3.86	30	\$10,107,000
TM002D	2035	PCCP Transmission Main Replacement Phase D (McLendon)	0.25	0.25	1.50	0.90	1.50	0.75	0.75	0.75	1.25	0.30	0.30	1.50	0.50	0.60	3.86	30	\$26,807,000
DP01	2035	Mount Vernon 36-inch Water Main	0.25	0.15	1.50	0.90	1.50	0.25	0.75	0.75	0.25	0.30	1.50	1.50	0.30	0.60	3.83	33	\$8,330,000
TR07	2035	Lawrenceville Hwy. Transmission Main	0.15	0.15	1.50	0.30	1.50	0.75	1.25	0.75	0.25	0.50	1.50	0.90	0.30	1.00	3.66	34	\$8,450,000
PS02	2035	Tucker Pump Station Replacement	0.15	0.15	1.50	0.90	1.50	0.25	0.75	0.75	0.25	0.30	0.90	1.50	0.30	0.60	3.58	35	\$3,350,000
GT01	2035	Dunwoody Ground Storage Tank Replacement	0.05	0.15	1.50	0.90	1.50	0.75	0.75	0.75	0.25	0.30	0.90	0.90	0.30	0.60	3.45	36	\$6,670,000
GT02	2035	West Tucker Ground Storage Tank and Pump Station	0.05	0.15	1.50	0.90	1.50	0.75	0.75	1.25	0.25	0.30	0.90	0.90	0.30	0.20	3.37	37	\$3,060,000
RS01	2035	Urbionia Pump Station Standby Power	0.05	0.15	0.90	1.50	1.50	0.25	0.75	0.75	0.25	0.30	0.30	1.50	0.50	0.60	3.35	38	\$750,000
TR03	2035	Chamblee-Dunwoody 60-inch Transmission Main	0.15	0.15	1.50	0.30	1.50	0.75	0.75	0.75	0.25	0.30	0.90	0.90	0.30	1.00	3.32	39	\$10,340,000
ET04	2035	Tucker Elevated Tank Replacement and 24-inch Transmission Main	0.15	0.15	1.50	0.90	1.50	0.25	0.25	0.75	0.25	0.30	0.90	0.90	0.30	0.60	3.30	40	\$12,230,000
P201	2035	Tucker Regulated Pressure Zone	0.05	0.25	0.30	0.90	1.50	1.25	0.75	0.75	0.75	0.30	0.30	1.50	0.30	0.60	3.04	41	\$200,000
P204	2035	Yellow River Pressure Zone	0.05	0.25	0.30	0.90	1.50	1.25	0.75	0.75	0.75	0.30	0.30	1.50	0.30	0.60	3.04	41	\$12,120,000
P210	2035	Rockbridge Pressure Zone	0.05	0.25	0.30	0.90	1.50	1.25	0.75	0.75	0.75	0.30	0.30	1.50	0.30	0.60	3.04	41	\$3,250,000
P209	2035	Hainston Pressure Zone	0.05	0.15	0.30	0.90	1.50	1.25	0.75	0.75	0.75	0.30	0.30	1.50	0.30	0.60	2.99	44	\$8,980,000
P207	2035	South River Pressure Zone	0.05	0.15	0.30	0.90	1.50	0.75	0.75	0.75	0.75	0.30	0.30	1.50	0.30	0.60	2.89	45	\$43,980,000
P208	2035	Constitution Pressure Zone	0.05	0.15	0.30	0.90	1.50	0.75	0.75	0.75	0.75	0.30	0.30	1.50	0.30	0.60	2.89	45	\$15,940,000
DP02	2035	Chaparral Service Area Expansion, Pressure Sustaining Valve and Check Valves	0.15	0.15	0.90	0.90	1.50	0.25	0.25	0.75	0.25	0.30	0.30	1.50	0.30	0.20	2.82	47	\$380,000

WATER DISTRIBUTION



^ Tuberculation: build-up of corrosion that restricts water flow

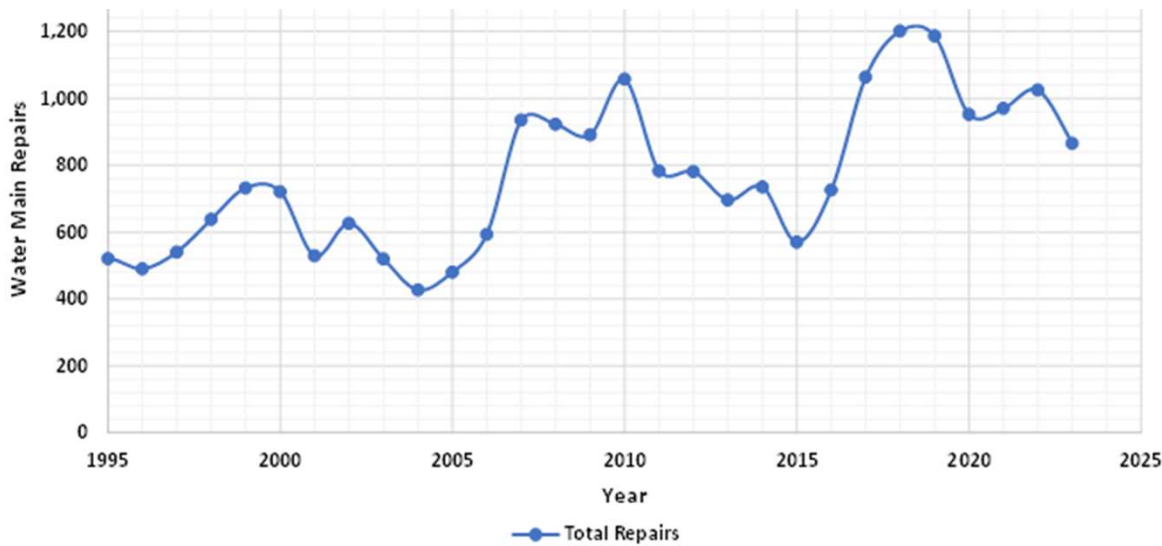
✓ Aging AC pipe is past its service life and prone to breaks.



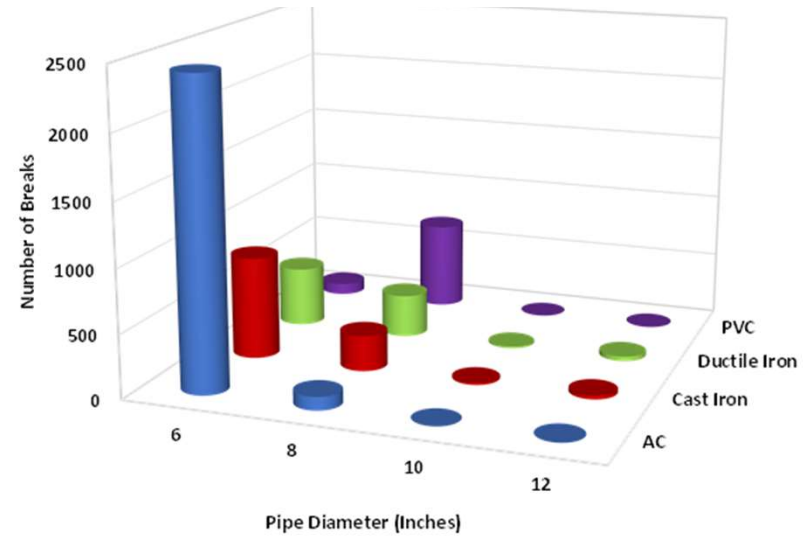
- ▶ By 2030 ~600 miles of water pipe needs replacement due to age, size or material type
- ▶ Age of pipes can cause risk of breaks or tuberculation
- ▶ Projects are prioritized using a risk-based approach and hydraulic modeling, ensuring a need and operational efficiency from each project implemented
- ▶ Non-revenue water at unacceptable levels (29%)
- ▶ All water projects make up 44% of CIP 2024 budget

Impacts of an aging water system

Water breaks per year are excessive and increasing as a general trend despite recent reductions



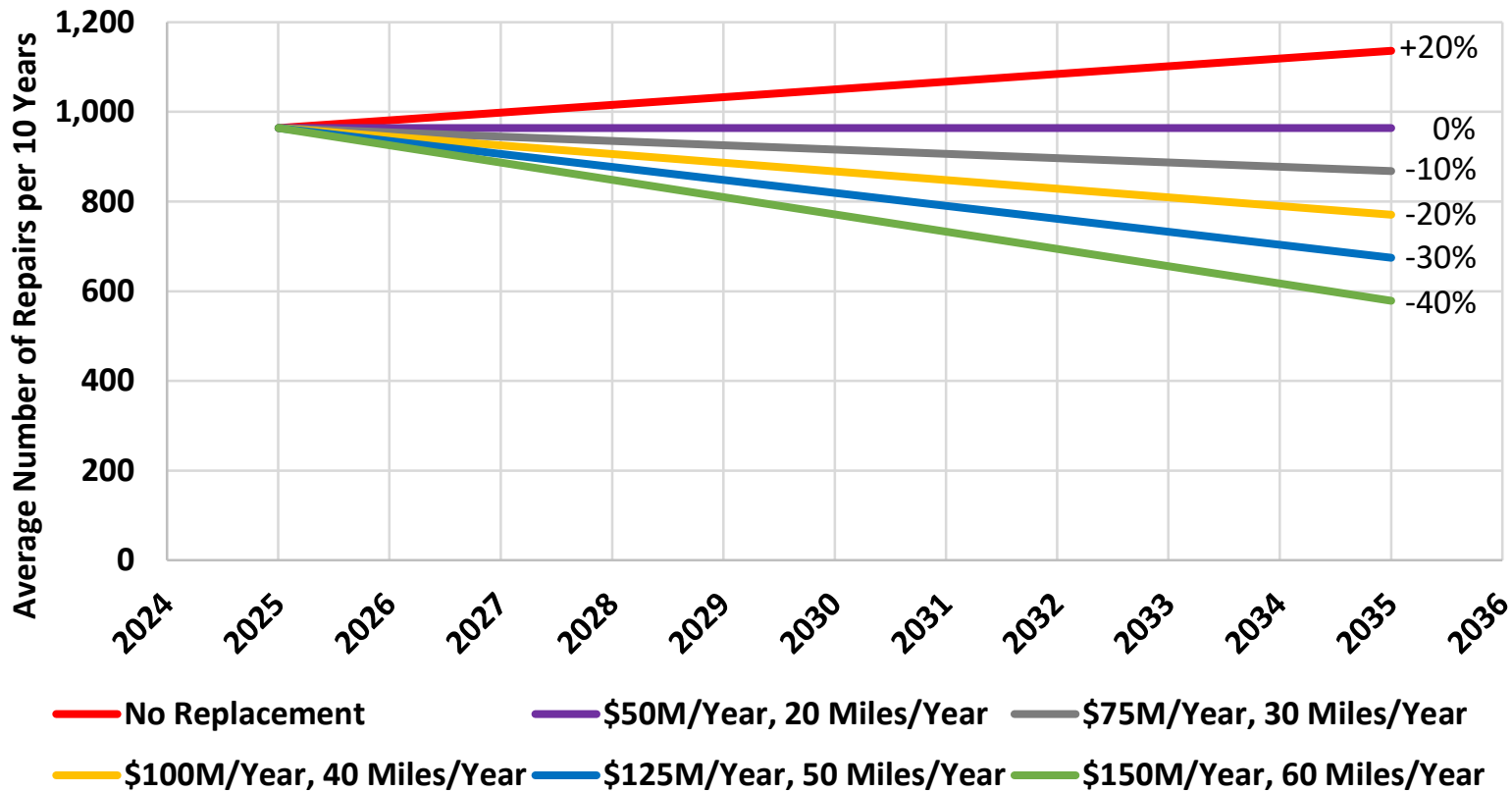
Breaks by pipe type and size (2017 to 2023)



Good Practice: A study in 2002 found that water systems in the U.S. averaged 25-30 breaks per 100 miles per year. DeKalb, at 33, is above that range. AWWA indicates best practice is 15 breaks/100 miles/year – ~ 450 breaks per year for DeKalb.

Water Distribution System

Estimated Small Diameter Water Main Replacement Impact on Repairs



PCCP – the good and the bad

Approaching completion:

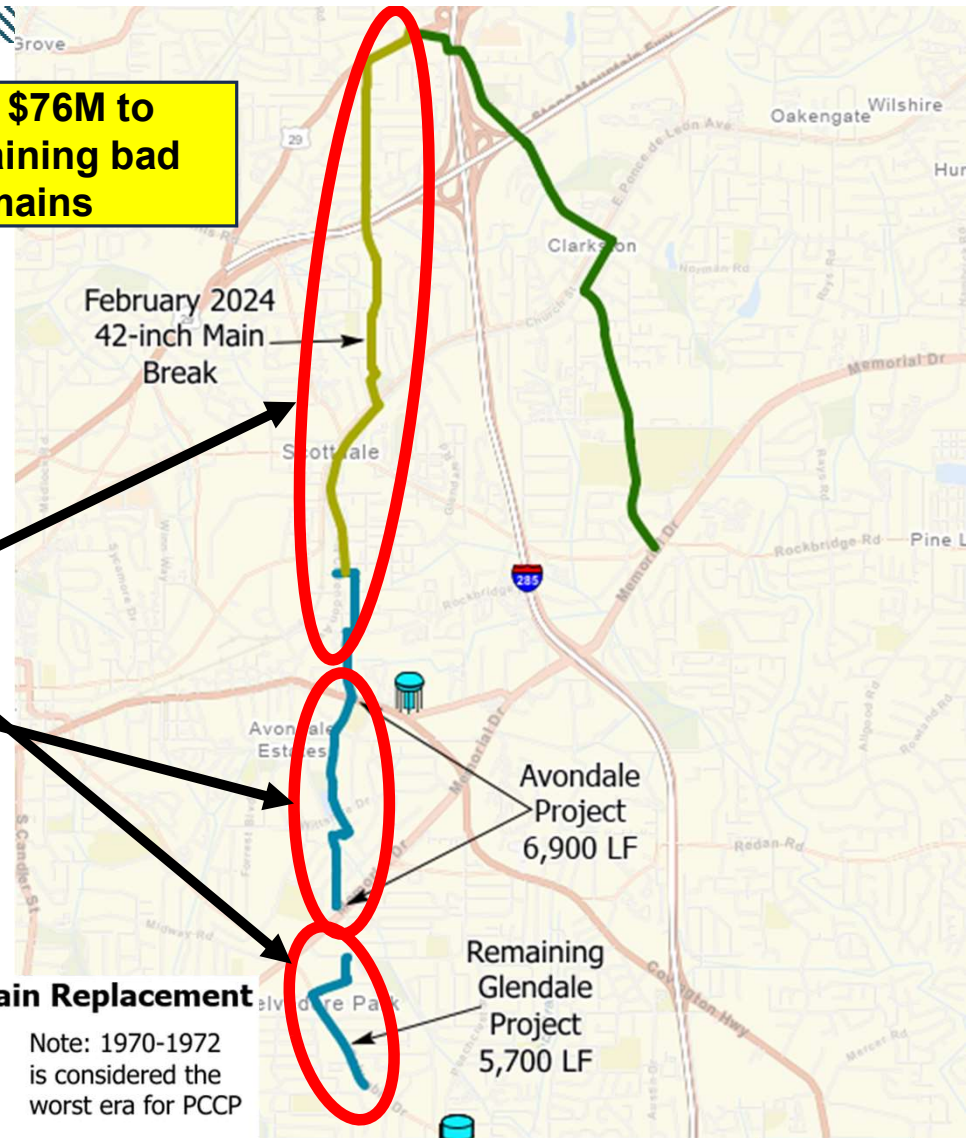
- ▶ 1970-1972 – problem period:
 - ▶ Glendale – planned for 2025
 - ▶ Avondale – in design
 - ▶ Remainder – in planning.
- ▶ Good period:
 - ▶ Currently performing well.

Roughly ... \$76M to replace remaining bad period mains

Remaining PCCP Transmission Main Replacement

— 30-inch, Installed 1963 -	17,800 LF
— 36-inch, Installed 1972 -	15,600 LF
— 42-inch, Installed 1970 -	16,700 LF
Total	50,100 LF

Note: 1970-1972 is considered the worst era for PCCP





PROBLEMATIC PIPE TYPES

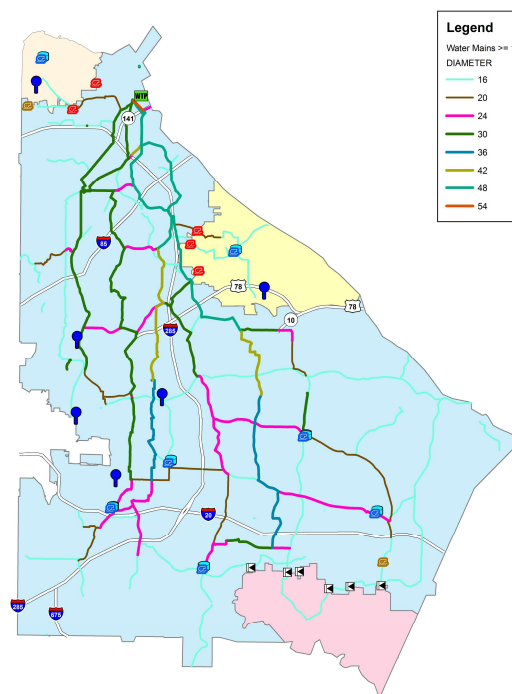
MATERIAL	LENGTH (MILES)	BREAKS (% of overall)	CHALLENGE
PRESTRESSED CONCRETE PRESSURE PIPE (PCCP)	7	<1	9x as likely to break as other materials, often catastrophically
ASBESTOS CEMENT (AC)	522	35	High break rate after 50-70 years of service (132 miles already greater than 65 years old)
POLYVINYL CHLORIDE (PVC)	210	12	
CAST IRON (CI)	820	27	Pipe will tuberculate with age, substantially reducing water flow (e.g. Briarcliff water pressure project)

- ▶ Miles of water pipe reaching 70 years old:
 - ▶ Now (2020): 215 miles (install date 1950 or earlier)
 - ▶ By 2030: 596 miles (install date 1960 or earlier)
 - ▶ By 2040: 1290 miles (install date 1970 or earlier)
 - ▶ By 2050: 1745 miles (install date 1980 or earlier)

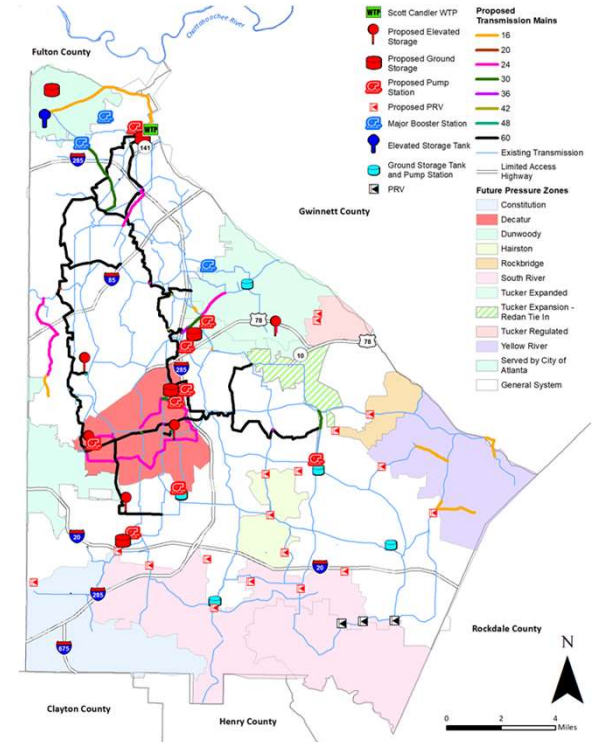
SYSTEM DEVELOPMENT

- ▶ Looped mains are industry best-practice for resiliency
- ▶ Additional capacity of water service “backbone” required to:
 - ▶ Meet levels of service in future years
 - ▶ Increase resiliency
- ▶ New pressure zones recommended to manage:
 - ▶ High and low pressures
 - ▶ Local storage
 - ▶ Reduce breaks and non revenue water

2020



2050





QUESTIONS?
