CIP 2021 - DEFINITION & FUNDING REPORT

EXECUTIVE SUMMARY

PART A: CAPITAL IMPROVEMENT PLAN (CIP) DEFINITION

DeKalb County, Georgia
Department of Watershed Management
February 2022

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OVERVIEW

Based on CEO Thurmond's recommendation, on February 23, 2021, the DeKalb County Board of Commissioners approved a new CIP program for 2021-2030 (CIP 2021). This visionary 10-year, $2.4 billion (in 2021 dollars) program will invest in and maintain the water and wastewater infrastructure vital to all County residents and businesses. CIP 2021 represents a new day for DeKalb County and has been developed using best-practice approaches and state-of-the-art hydraulic modeling, master planning, and project prioritization techniques.

The County developed CIP 2021 through a thorough and transparent process involving frequent reports and presentations to the Board of Commissioners. This Executive Summary highlights key information and decisions from these touchpoints. A full archive of public materials can be accessed using this link.

This two-part Executive Summary defines the spending and funding plans for the program.

PART A: CIP DEFINITION

Summarizes the spending plan for CIP 2021 and describes the steps in the program definition and delivery lifecycle, which include identifying, prioritizing, approving, and delivering CIP projects.

PART B: CIP APPROVAL AND FUNDING

Summarizes the funding plan for CIP 2021 and describes actions to maximize revenues, minimize expenses, support customers in need, and reduce the cost of borrowing.

SPENDING PLAN BACKGROUND

- SPEND SUMMARY
- HISTORICAL OVERVIEW
- PROGRAM LIFECYCLE
- OUTCOMES: BALANCING SYSTEM NEEDS
- CIP 2021 BENEFITS

FUNDING PLAN BACKGROUND

- REVENUE OPTIMIZATION PROCESS
- DECREASE OPERATING COSTS
- INCREASE REVENUE & ASSIST THOSE IN NEED
- OUTCOMES: REVENUE OPTIMIZATION
- SUSTAINABLE SYSTEM REPLACEMENT

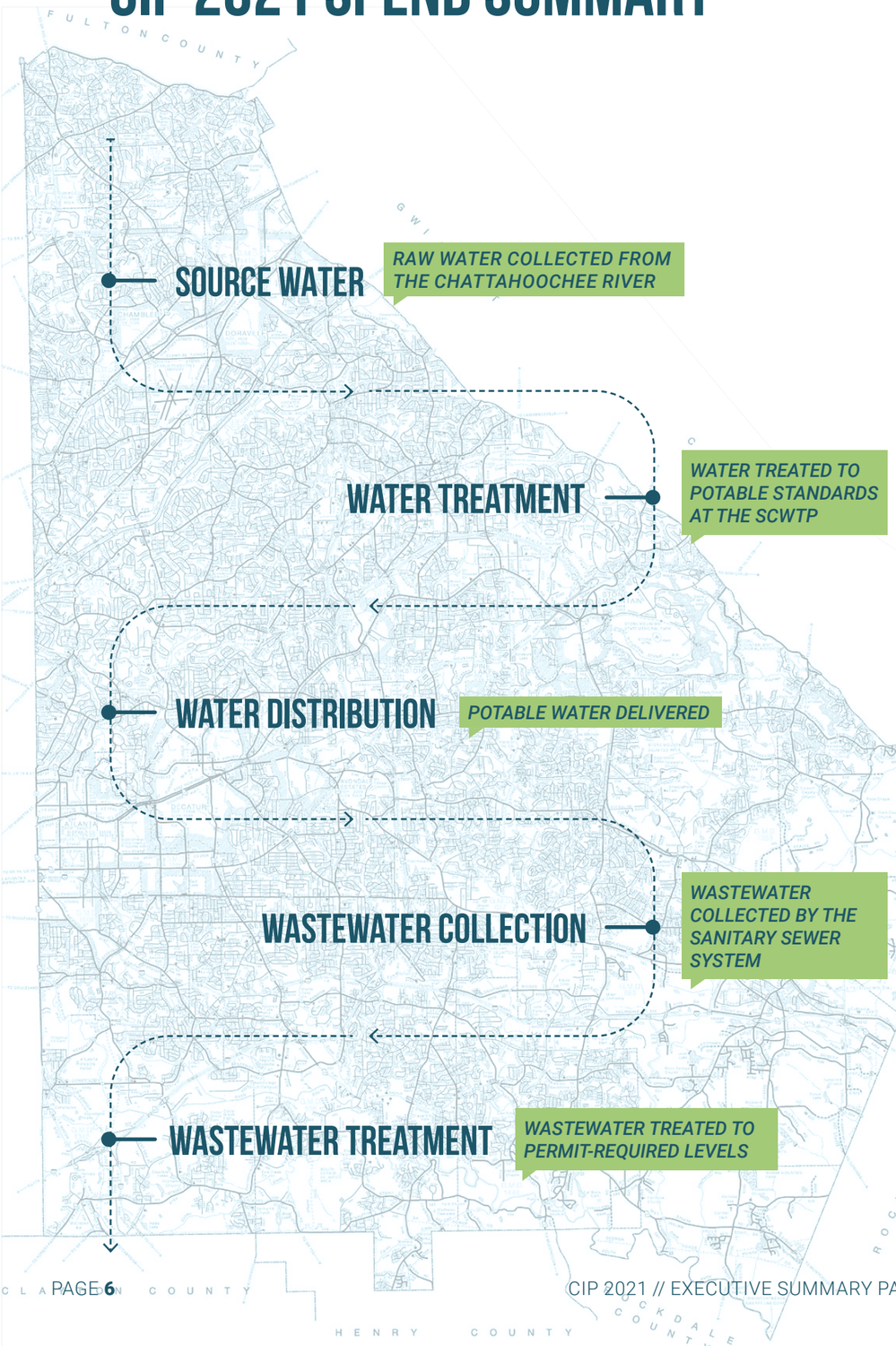
CIP DEFINITION BACKGROUND

DeKalb County, Georgia, formed in 1822, has provided centralized, county-wide water and wastewater services since 1942 when officials established the Department of Watershed Management (DWM). Today DWM develops, operates, and maintains an estimated 6,000 miles of pipe throughout the County's water distribution and wastewater collection systems. In addition to this underground infrastructure, DWM's assets include the Scott Candler Water Treatment Plant, the Snapfinger and Pole Bridge Advanced Wastewater Treatment Facilities, and some City of Atlanta facilities.

The County has made substantial investments in capital projects to maintain and further develop these systems. In 2010, DWM created a Capital Improvement Plan (CIP 2010) to deliver these projects through a consistent and well-documented approach. Prior to 2017, neglect and mismanagement caused DWM to miss its delivery targets for the program, but new leadership stepped up in 2017 to accelerate projects and drive the CIP to completion. As CIP 2010 nears completion, DWM has drawn on best practice hydraulic modeling and master planning techniques to analyze, prioritize, and fund investments that are still critically needed. This work has culminated in CIP 2021—a new capital program that will enable the County to effectively and responsibly deliver these projects through 2030.

CIP UPDATES, COMMUNITY MEETING RECORDINGS, AND WATER SAFETY VIDEOS CAN BE FOUND ON DEKALB COUNTY'S WEBSITE AND DEKALB WATERSHED'S YOUTUBE CHANNEL

CIP 2021 SPEND SUMMARY



$2.4 BILLION PLANNED SPEND

$2.4B

CIP 2021 is a $2.4 billion (in 2021 dollars) **investment in maintaining and developing water and wastewater infrastructure in DeKalb County**. Proposed CIP 2021 investments are summarized in the spend categories below.

REOCCURRING ANNUAL COSTS

23%

Reoccurring payments and projects make up 23 percent of CIP 2021. **Intergovernmental Agreements (IGAs) are the largest component of reoccurring costs** and include payments to the City of Atlanta to treat roughly half of the County's wastewater load and partnerships with the Georgia Department of Transportation (GDOT) to coordinate infrastructure upgrades beneath roadway projects. This category also includes annual and emergency contracts to address unforeseen needs to maintain aging infrastructure. These contracts are based on bid tabulations, which enable projects to be priced based on a pre-agreed schedule of values.

WATER TREATMENT

4%

As DeKalb County is served by a single water treatment plant—the Scott Candler Water Treatment Plant (SCWTP)—CIP 2021 includes water treatment investments designed to improve the resilience of this vital facility. **SCWTP was recently upgraded and remains a state-of-the-art facility, translating to water treatment having the lowest planned expenditure (4 percent) among CIP 2021 spend categories.**

WATER DISTRIBUTION

31%

Accounting for 31 percent of CIP 2021, **water distribution investments will address several pressing needs: replacing aging and issue-prone pipes and increasing system capacity and resilience.** DWM is using sophisticated hydraulic models to better understand the condition of its assets system-wide and prioritize the most critical investments, **including the 1,000+ miles of pipe that has aged past its planned service life**.

WASTEWATER COLLECTION

37%

At 37 percent, wastewater collection projects make up the largest spend category in CIP 2021. Most of these projects respond to the Consent Decree (CD) the County entered into in 2011{link} and include rehabilitating and up-sizing wastewater collection assets to bring the system into CD compliance. **The largest investments address capacity issues in major trunk sewers through up-sizing and building relief sewers and storage infrastructure.** These capacity projects are needed urgently, especially in the Snapfinger Basin.

WASTEWATER TREATMENT

5%

DeKalb County has two wastewater treatment facilities: Snapfinger {link} and Pole Bridge. Following major investments at the Snapfinger Plant in CIP 2010, only about 5 percent of CIP 2021 will be required for wastewater treatment upgrades. **Investments include projects to complete the Snapfinger Plant expansion and targeted improvements at Pole Bridge, which remains adequately sized for its demands.**

HISTORICAL OVERVIEW

FORMATION, DEVELOPMENT, AND PERIOD OF NEGLECT AND MISMANAGEMENT

The County's early investments in water and wastewater systems helped enable its surge in growth from the 1940s through the 1970s. During this period, the population more than quadrupled and DeKalb County emerged as the second most populous county in Georgia.

As population approached 700,000 around 1980, neglect and mismanagement began to adversely affect the County's water and wastewater systems. Substantial investment went into upgrading treatment plants into state-of-the-art facilities, but underground pipes and sewers were not properly maintained and developed. Failures to maintain aging infrastructure (some pipes dating back over 100 years) and plan for future needs became evident through an increasing number of wastewater spills that damaged the environment, threatened public health, and led to litigation with the federal and state governments.

In 2011, the County reached a Clean Water Act settlement in the form of a Consent Decree (CD) with the U.S. EPA and Georgia Department of Natural Resources Environmental Protection Division. DWM implemented CIP 2010 to execute construction required under the CD, but further delays—exemplified by the County's failure to hire and on-board CD and CIP Program Managers until 2014 and 2015 (respectively)—led to only 27 percent of the five-year program being completed through 2016.

1822

DeKalb County is formed

1940

General Motors locates their new automobile manufacturing plant in Doraville

1940-1970

Population surges. As infrastructure expands rapidly, the County's population more than quadruples and DeKalb County emerges as Georgia's second largest county.

1942

County forms DWM to provide potable water distribution and wastewater management services county-wide

1980

Population approaches 700,000. County water and wastewater systems enter a period of neglect and mismanagement.

2011

CIP 2010 developed to execute projects arising from the Consent Decree

2015

CD and CIP program management team brought on board

2016

CIP 2010 only 27 percent complete

2020

We're going to go all across this county and get the job done, but you can't undo 40 years of neglect in three years.

Article in the AJC, March 12, 2020

2020

CIP 2010 completed with a four-fold increase in the annual rate of project delivery

TURNING THE CORNER

In January 2017, Michael L. Thurmond was sworn in as the County's Chief Executive Officer (CEO) and the County's Board of Commissioners (Board) was fully constituted following years with vacant seats. Recognizing that both the CD and CIP 2010 programs were not progressing quickly enough, the new leadership commissioned a root cause analysis in 2018. This analysis revealed that the slow progress was caused by political interference in DWM operations, inadequate oversight, allegations of corruption and favoritism, and lack of transparency.

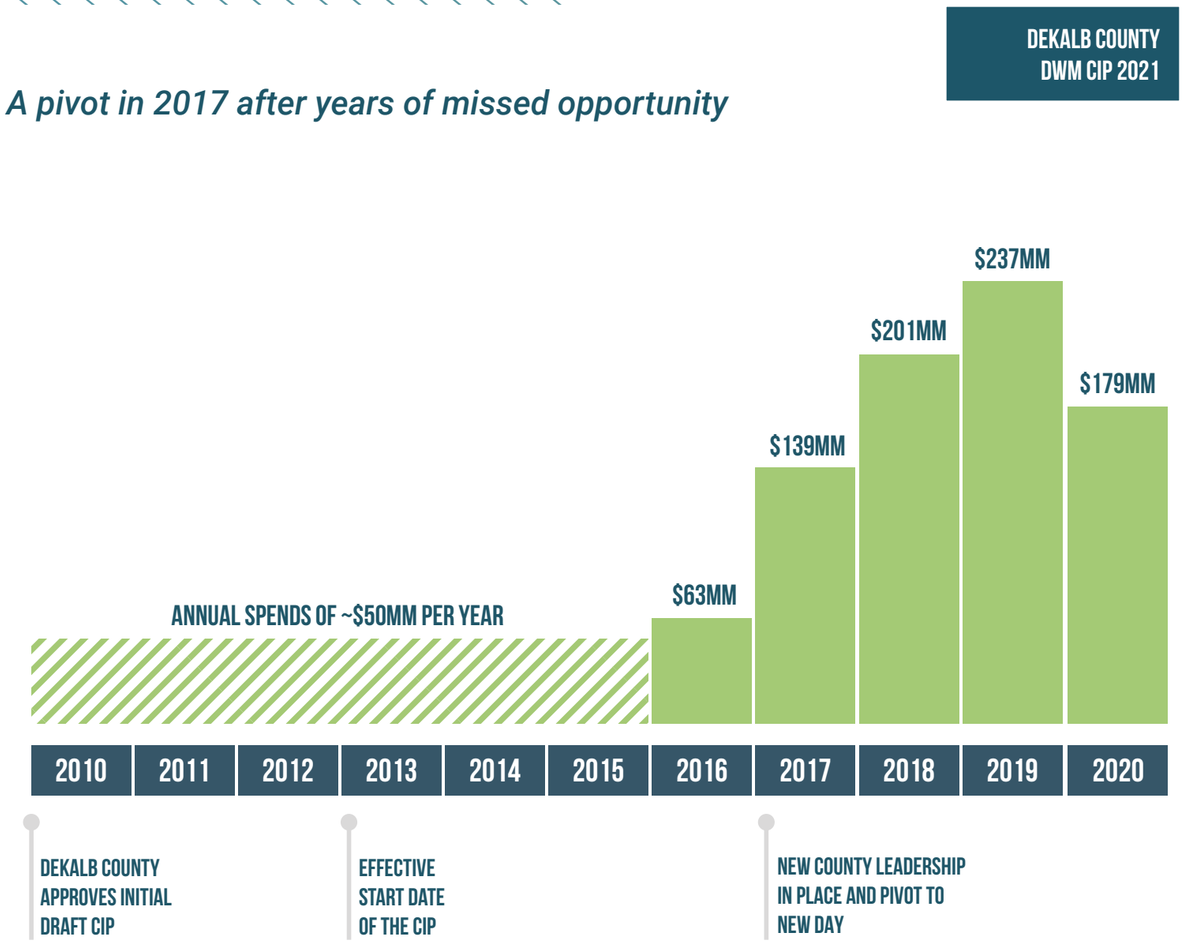
The CEO and Board immediately pursued aggressive changes to DWM leadership and culture, resulting in rapid improvements—**since this pivot, $756 million of key CIP investments have been completed.**

A NEW DAY

CEO Thurmond declared a "New Day" of accountability and productivity to rectify the issues caused by historical neglect and mismanagement. Under new leadership, DWM has made great strides including:

- Investing in best practice tools for infrastructure planning such as **computer-based hydraulic models** for both the water delivery and wastewater collection systems
- Developing a detailed **Water & Wastewater Master Plan** through 2050
- Improving project delivery processes and developing a **Program Management Plan (PMP)**. These efforts resulted in a four-fold increase in the value of work completed in 2019 compared to 2015. DWM's project delivery capability is now at the levels needed to implement CIP 2021.
- Launched the **New Day Project** to identify and address the root causes of billing issues, resulting in the upgrade or replacement of nearly 100,000 meters and beginning the process to implement a new Utility Customer Billing System.

A pivot in 2017 after years of missed opportunity



"We did not create these challenges… they have evolved over decades, but we must, now in this CIP horizon, begin the work to solve them."

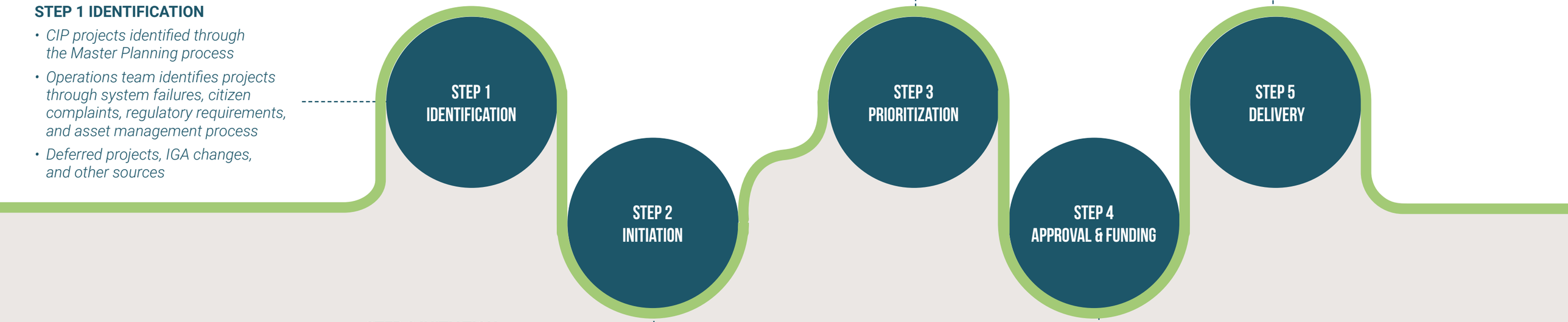
Michael L. Thurmond, CEO

CAPITAL IMPROVEMENT PLAN PROGRAM LIFECYCLE

DWM has developed and documented new processes and procedures for the CIP program lifecycle—from initial project development through prioritization, approval, funding, and delivery.

STEP 1 IDENTIFICATION

- *CIP projects identified through the Master Planning process*
- *Operations team identifies projects through system failures, citizen complaints, regulatory requirements, and asset management process*
- *Deferred projects, IGA changes, and other sources*



STEP 2 INITIATION

- *Determine if proposed project qualifies as a CIP project*
- *Prepare, approve, and submit a Project Initiation Form for inclusion in the Master Schedule and Program Budget*

STEP 3 PRIORITIZATION

- *Each proposed CIP project is scored by the technical team through a multi-criteria analysis and subsequently prioritized*
- *An Executive Committee performs final review and approval of project scores and rankings*
- *As CIP projects take multiple years to progress through delivery, an annual prioritization process is completed to align plans with the County's changing needs and funding capacity*

STEP 4 APPROVAL & FUNDING

- *Governing authority reviews and approves the CIP program and its funding plan*

STEP 5 DELIVERY

- *CIP projects are delivered through the project lifecycle process documented in the Program Management Plan (PMP). Steps include planning, design, and construction.*

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3
2
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STEP 1: IDENTIFICATION

Using newly developed computer-based hydraulic models, DWM can monitor water and wastewater system performance in real-time to identify and troubleshoot issues. The detailed information these models provide has enabled DWM to complete its first ever Water and Wastewater Master Plans. These plans are milestone achievements that support the community's vision for sustained growth and prosperity and align with the County's economic development plans. They establish responsible operational processes and financing practices that are guiding DWM as it develops and implements system policies, capital projects, and service strategies.

To develop the Master Plans, DWM drew heavily on both hydraulic modeling software and stakeholder engagement. Hydraulic models identified future service scenarios based on projected population and employment levels through 2050 and evaluated the costs and benefits of each alternative. The County validated and refined these options with input from stakeholders.

Through these efforts, DWM determined which capital projects would be needed between today and 2050, including critical (2025), short-term (2030), mid-term (2040), and long-term (2050) projects. The Department also used this information and input to craft high-level service strategies through 2070.

STEP 2: PROJECT INITIATION

Once potential projects are identified—either originating from Master Plans or arising from operational needs—DWM evaluates whether each proposed project qualifies as an appropriate investment to include in the CIP. DWM officials complete a common project sheet (i.e., initiation form) that describes the scope of work and provides information necessary to determine if the project is, in fact, a CIP project (as opposed to an operational cost). Based on this initial evaluation, some projects will drop out of consideration for CIP 2021, although they may be funded through other initiatives.

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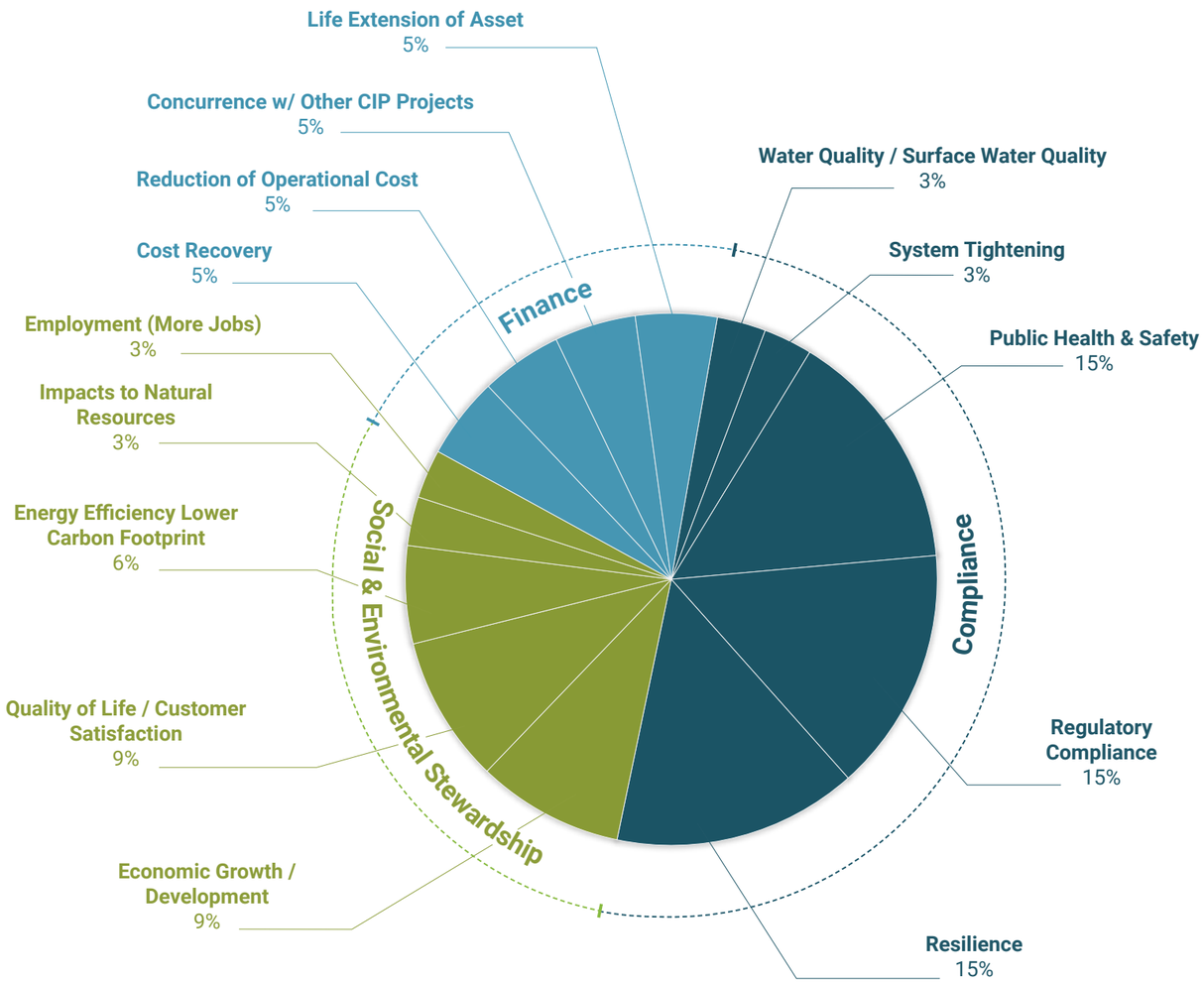
STEP 3: PRIORITIZATION

DWM used a team-based, multi-criteria analysis approach to prioritize CIP 2021 projects. This best practice method, which is both defensible and reproducible, is used by leading global organizations to rank order their investments, such as for the World Bank's Infrastructure Prioritization Framework and the U.S. EPA's Integrated Planning Framework.

Team-based, multi-criteria analysis solicits input from stakeholders to systematically evaluate (and periodically reevaluate) competing priorities against a set of agreed-upon prioritization criteria. For CIP 2021, DWM has identified a broad set of factors against which to assess projects, ranging from compliance requirements to financial impacts to social and environmental benefits. DWM engages teams with a diverse array of perspectives to assess how projects perform on these criteria. The Master Plans and hydraulic models provide a robust base of evidence for these teams to draw from when prioritizing investments.

DWM used the prioritization framework to analyze all CIP projects identified in Step 2 and determine which could be afforded. Among these projects, DWM advanced the top 80 percent to be funded. Forty-four are improvements to the water distribution network and 105 are upgrades to the wastewater management network. The prioritization process is thoroughly documented in Chapter 02 of the CIP Program Management Plan.

Prioritization framework with factors and criteria weights



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STEP 4: APPROVAL AND FUNDING

As new CIP projects are identified and prioritized, DWM and DeKalb County Finance work together to develop detailed funding plans. These plans help make sure DWM has sufficient funds to support both its operating costs and CIP expenditures. Plans may be updated to align with evolving needs, such as when the number of projects included in the CIP is refined to match available funds or when additional funding is secured to support additional projects.

The Funding Plan required to support CIP 2021 is discussed in greater detail in Part B of this Executive Summary.

STEP 5: DELIVERY

Once capital projects are defined and funded, it is critical that project delivery conforms to the schedules and budgets defined in the CIP. One common issue many programs face involves projects under-spending and generating excess funds, which leads to negative arbitrage—a situation where the debtor pays full interest on a loan or bond despite the principal not being completely spent. The County estimates it incurred as much as $80 million in negative arbitrage due to delays in delivering CIP 2010.

The CIP 2021 delivery team has developed a suite of tools and standard methods to help deliver projects on-budget, on-schedule, and with consistently high quality. One essential resource is the Program Management Plan (PMP) DWM developed in 2017, which documents standard operating procedures project managers and staff are expected to follow when planning, designing, and constructing CIP projects. The PMP contains detailed guidance on processes and workflows, as well as links to supporting tools such as forms and templates.

PMP Chapters: Standard Operating Procedures

PMP01 **Program Organization & Governance**	PMP02 **Project Prioritization**	PMP03 **Project Management - Planning**	PMP04 **Project Management - Design**	PMP05 **Project Management - Construction**
PMP06 **Procurement & Contract Management**	PMP07 **Safety, Health & Environment**	PMP08 **Quality Management**	PMP09 **Risk Management**	PMP10 **Communications Management**
PMP11 **Cost & Schedule Management**	PMP12 **Reporting**	PMP13 **Document Control**	PMP14 **Cost Estimating**	

OUTCOMES OF CIP DEFINITION: BALANCING SYSTEM NEEDS

During the past two decades, DWM channeled most of its capital investment into large projects that updated and upgraded the County's *above-ground* treatment facilities. These improvements have positioned the County to provide clean drinking water and reliable wastewater treatment services today and meet the projected demands of the growing population. With these projects largely complete, **DWM's investment focus must now transition to its below-ground water distribution and wastewater collection systems.**

Buried infrastructure makes up 68 percent of CIP 2021 project spending, highlighting how important it is to maintain the unseen yet critical portions of the system. As these underground systems age, they are performing far below their needed capacity, resulting in relatively high levels of water loss, system failures, and sanitary wastewater spills.

CIP 2021 will focus on two major areas of investment:

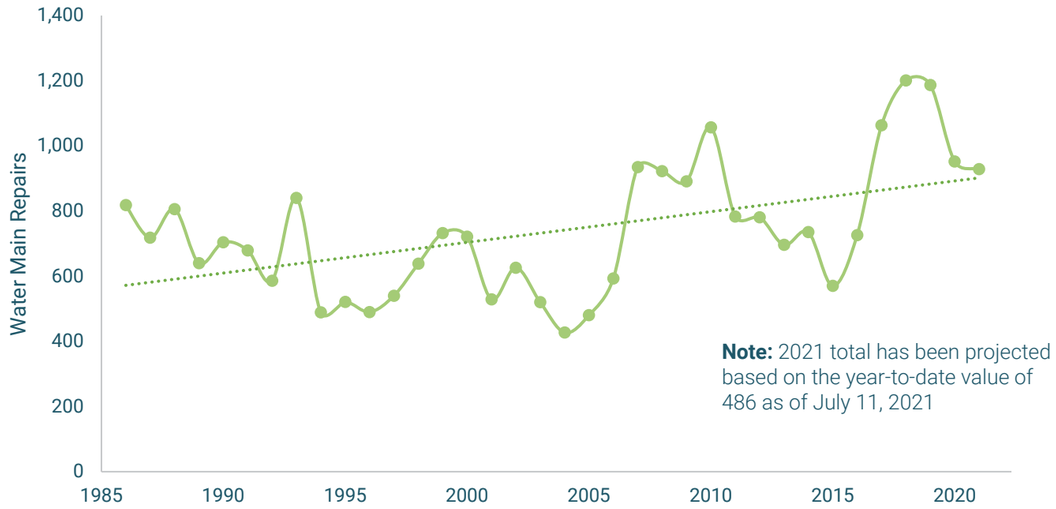
1. **Deliver critical water distribution projects**
2. **Expand trunk sewer capacity to comply with CD**

MAJOR INVESTMENT AREA 1: DELIVER CRITICAL WATER DISTRIBUTION PROJECTS

SIGNS OF AN AGING AND UNDER-SIZED SYSTEM

In recent years, the number of water line breaks has grown to more than 1,000 annually (on average). Whether the break occurs on a small service line inconveniencing a few customers or on a major water main, such as the 2018 break near Buford Highway that resulted in a boil water advisory, neither is acceptable. Breaks result in financial losses for the County, drain maintenance resources, reduce system resilience, and often lead to adverse social and environmental consequences.

Water distribution system historical water main repairs



The increase in water distribution system failures results from two main causes: (1) aging pipelines and (2) excessive pressures on an under-sized system. CIP 2021 investments will target these issues.

REPLACING AGING PIPELINES

The County's water distribution system includes roughly 3,000 miles of water pipe. Around 215 miles of this pipe are reaching 70 years of age and require replacement. Also, by 2050, an estimated 1,745 miles of pipe will reach 70 years of age or older if they are not replaced on a set timetable. To compound this challenge, many pipes are made of less resilient materials with shorter life expectancies than ductile iron (the current industry standard). These outdated materials include pre-stressed concrete pressure pipe (7 miles), asbestos cement (522 miles), and cast iron (820 miles). As an example of the County's efforts, DWM replaced seven miles of aging water pipes in the Druid Hills community following water pressure problems in 2021. The City of Atlanta had originally installed these pipes in the 1920s.

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)**

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

*American Water Works Association, 2020

Massive water loss and a boil water advisory resulted from a failed 48 inch-diameter water main near Buford Highway in 2018 (photo from AJC, March 7, 2018)

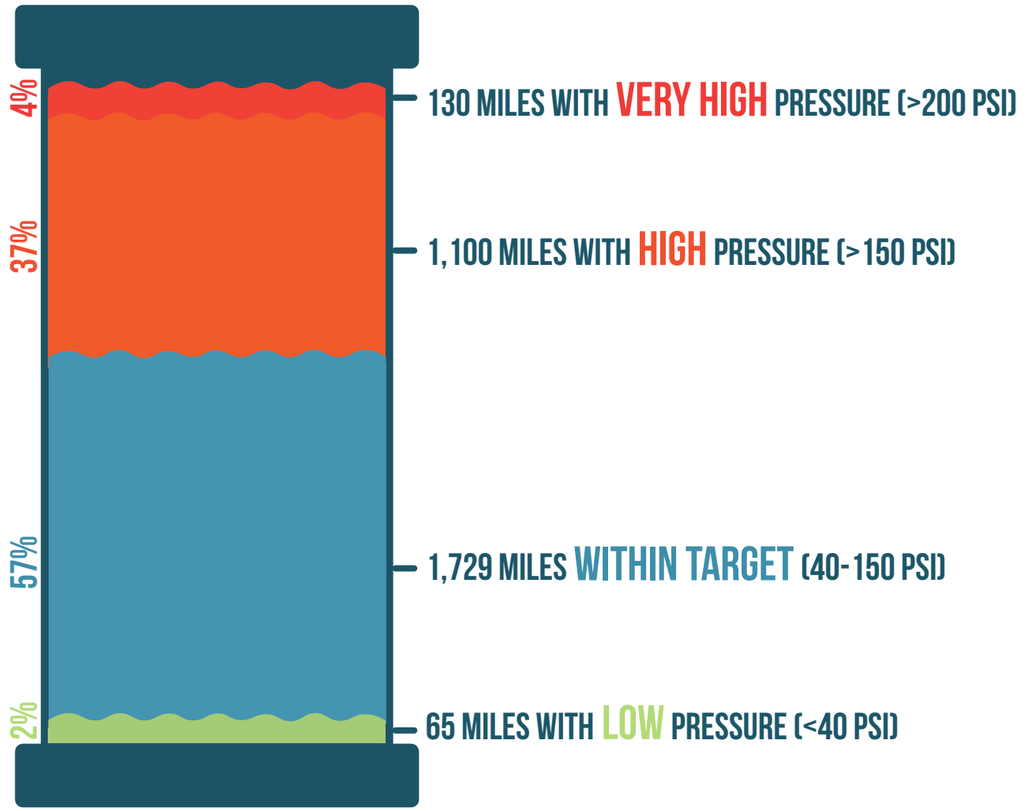
UPGRADING THE SYSTEM TO REDUCE PRESSURES AND ADD RESILIENCY

New hydraulic models have revealed that the most significant challenge facing the County's water distribution system is its constrained transmission capacity. DWM's outmoded pressure management approach and undersized delivery system mean that greater effort is required to push water through the network—a situation that leads to excessively high pressure and compromises resilience. In fact, water mains experiencing high pressure (>150 psi) make up around 41 percent of the system and far exceed those with low pressure.

DeKalb Water Main System Pressure

17 TIMES More water mains experiencing high pressure (>150 psi) than low pressure (<40 psi). Two times as many experience very high pressure (>200 psi).

130 MILES Length of water mains doubling the max pressure recommended by Georgia EPD and ten other state standards. This is four percent of the system.

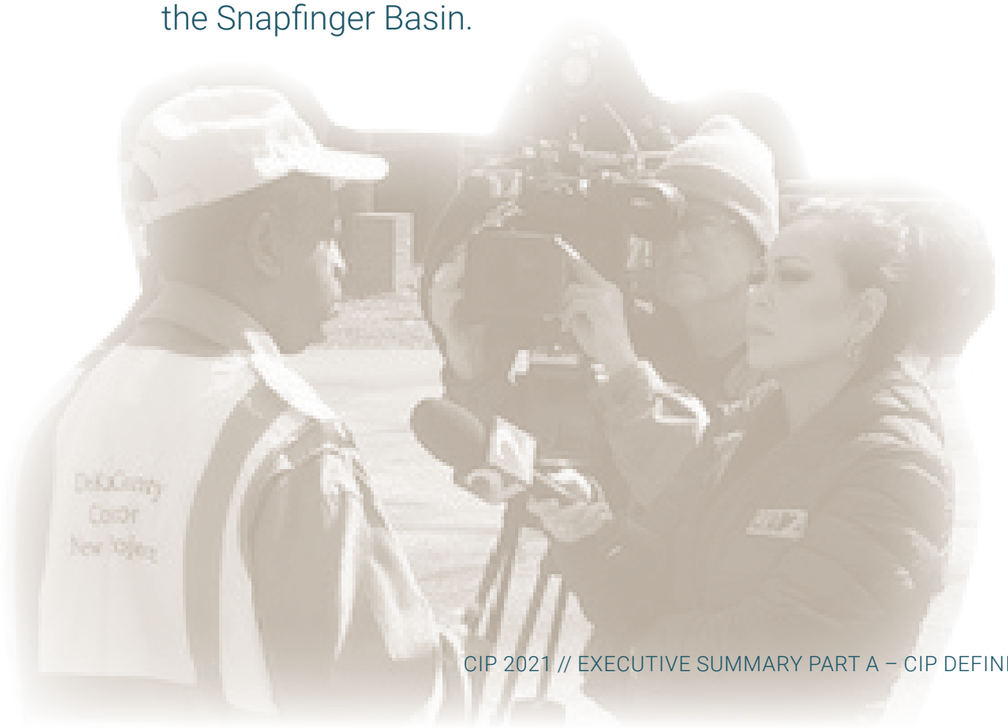


DeKalb County Water Master Plan targets a maximum pressure of 150 psi. Georgia EPD, along with 10 other state standards, recommend 100 psi maximum.

MAJOR INVESTMENT AREA 2: EXPAND TRUNK SEWER CAPACITY TO MEET CONSENT DECREE

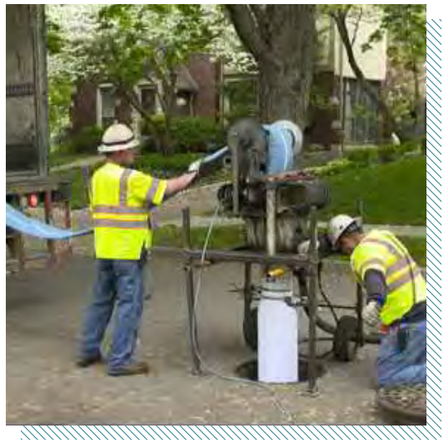
NEXT PHASE OF CONSENT DECREE

Having now successfully completed CIP 2010, the County has negotiated a modification to the CD with the U.S. EPA and State of Georgia. A key change involves pivoting away from projects that reduce inflow and infiltration into the sanitary system and toward investments that increase the flow capacity of major sewer trunk lines. A trunk sewer is a large-diameter line that receives wastewater flows from tributary feeder branch lines (for DeKalb County, pipes ranging from 30-72 inches wide are considered large-diameter). As part of the CD modification, DWM will improve capacity across 59 miles of trunk lines, focusing primarily in the Snapfinger Basin.



Consent Decree Requires Four Main Types of Wastewater System Improvements

BY 2027...



Rehab 133 miles of leaking pipes through trenchless technologies (where possible)

Perform 1,600 point repairs of localized pipe failures

Upsize or replace 35 miles of small diameter sewer pipe

Upsize 45 miles of large diameter "trunk" sewers

CIP 2021 PRIORITY PROJECTS

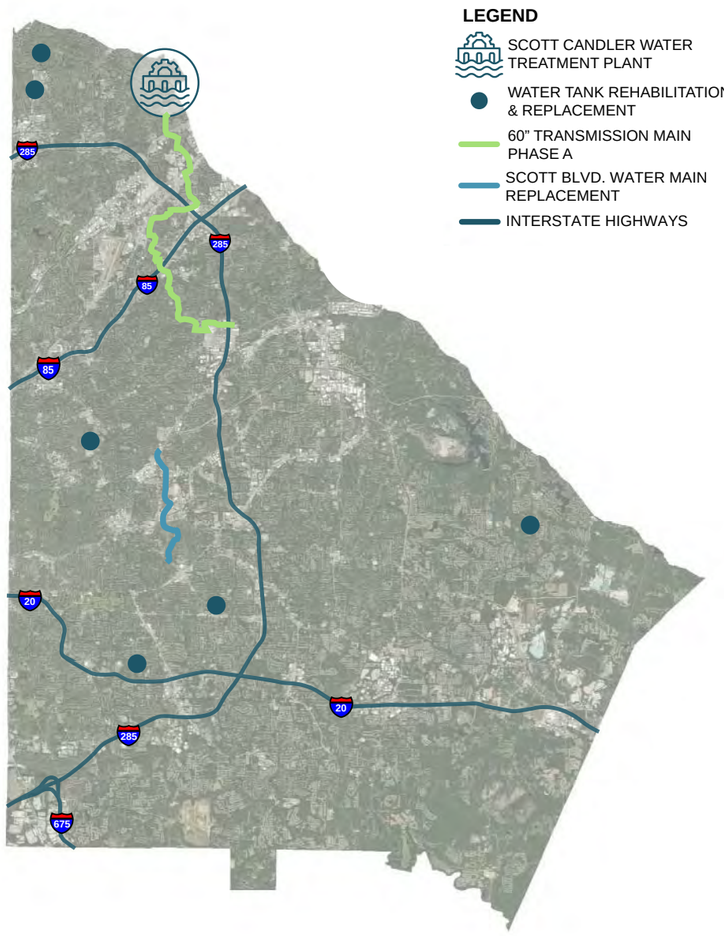
*CIP 2021 Water Projects **

3% Rehabilitation and replacement of aging water storage tanks ($61M)

4% Upgrades at the Scott Candler Water Treatment Plant ($104M)

7% Construction of a 60-inch water transmission main ($180M)

17% Aging watermain replacement projects ($413M)



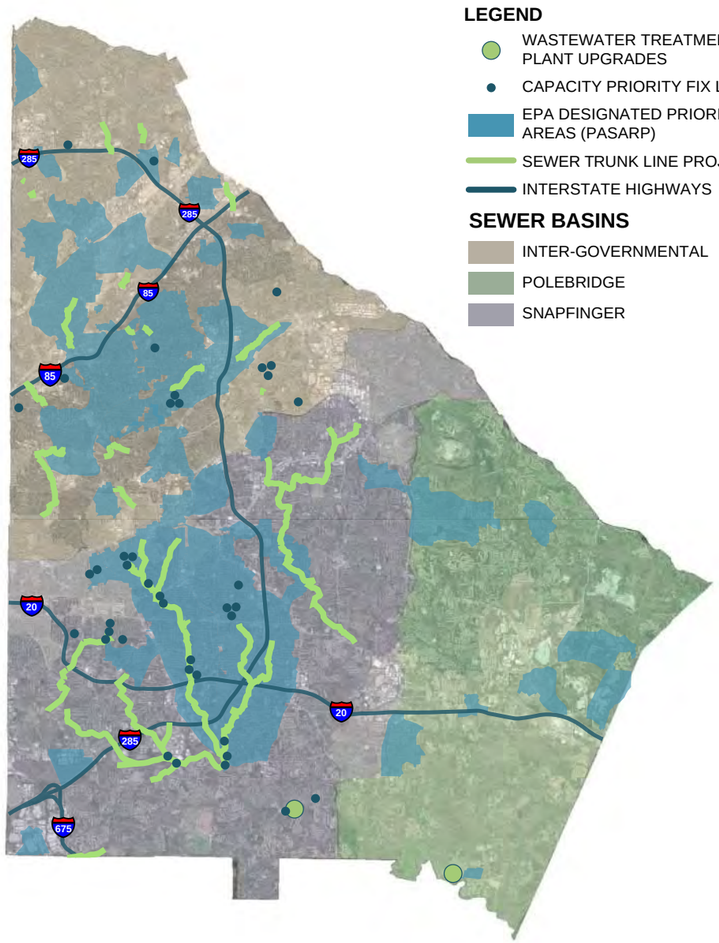
LEGEND

- SCOTT CANDLER WATER TREATMENT PLANT
- WATER TANK REHABILITATION & REPLACEMENT
- 60” TRANSMISSION MAIN PHASE A
- SCOTT BLVD. WATER MAIN REPLACEMENT
- INTERSTATE HIGHWAYS

*CIP 2021 Wastewater Projects **

6% Wastewater treatment plant upgrades. ($135M)

24% Trunk sewer capacity improvement projects ($576M)



LEGEND

- WASTEWATER TREATMENT PLANT UPGRADES
- CAPACITY PRIORITY FIX LIST
- EPA DESIGNATED PRIORITY AREAS (PASARP)
- SEWER TRUNK LINE PROJECTS
- INTERSTATE HIGHWAYS

SEWER BASINS

- INTER-GOVERNMENTAL
- POLEBRIDGE
- SNAPFINGER

**These projects represent a substantial portion of the program budget. The remaining budget will help fund reoccurring annual costs such as intergovernmental agreements and emergency repair contracts.*

CIP 2021 BENEFITS

CIP 2021 will improve the often unseen water and wastewater infrastructure resulting in tangible benefits for DeKalb residents and businesses and enhancing economic development.

SET THE STAGE FOR EQUITABLE INVESTMENT

- Since 2017, businesses and residents have made 1,551 requests for sewer connections. 384 are still pending.
- Sewer system capacity constraints have disproportionately affected southern DeKalb County, limiting new investment in historically disadvantaged areas.
- CIP 2021 investments will make sure beneficial future development, such as new housing and grocery stores, are no longer held back due to water and sewer system limitations.

Modified Consent Decree

County leaders worked with state and federal officials to modify the CD. These changes enable the County to bank credits for work completed and then build new connections to areas that have been capacity constrained. This means many historically underserved areas with capacity limits will not have to wait until the CD ends to invest in development.

BENEFIT OUR SHARED ENVIRONMENT

- CIP 2021 investments aim to provide clean, healthy drinking water to all residents and drastically reduce the risk of wastewater infiltrating our natural amenities.
- Reducing sanitary sewer spills protects our water resources and enhances the wellbeing of our environment and community.
- Reducing water losses protects the health of our regional rivers.

FACILITATE SMART DEVELOPMENT

- By 2050, the population served by the system is projected to exceed one million residents. Also, businesses in DWM's service area employ around 640,000 people (and growing).
- CIP 2021 projects will help DWM provide reliable and high-quality water and wastewater services to all residents, now and in the future.
- Planned growth means increased opportunities for business and employment and an expanded tax base.

CREATE NEW JOBS

- CIP 2021 will create an estimated 4,200 jobs (direct, indirect, and induced) during its 10-year lifespan.

CHIEF EXECUTIVE OFFICER
Michael L. Thurmond

BOARD OF COMMISSIONERS
Robert Patrick, District 1
Jeff Rader, District 2
Larry Johnson, District 3
Steve Bradshaw, District 4
Mereda Davis Johnson, District 5
Ted Terry, District 6
Lorraine Cochran-Johnson, District 7

South River, Georgia (photo from AJC)