2020 RETREAT AGENDA

Friday, April 5, 2019
Old Fayette County Courthouse
3rd Floor - Fayetteville, Georgia

Breakfast (7:30am – 8:00am) – 30 minutes

FY2019 FINANCIAL REVIEW

Financial Overview/Forecast (8:00am-9:00am) – 1 hour

1. **TAX Funds/ FY 2018 FB Audited Position/FY 2019 FB Projections/Impact/Trends**
    a. General Operating Fund Balance (FB) Audited FY 2018
        i. Tax Digest/Revenue History
            1. Property Digest History
            2. Motor Vehicle/True-Up/TAVT Sales Tax
            3. LOST/SPLOST Sales Tax
    b. 911 Operations Fund
    c. Fire Services Fund
    d. Emergency Medical Services Fund
2. **Other Operating Funds Statistics**
    a. County Jail Surcharge Fund History/Projections
    b. Water System Net Assets
    c. Solid Waste Net Assets
3. **Internal Service Funds Statistics**
    a. Workers Compensation
    b. Employee Insurance: Medical/Dental/Vision
4. **Tax Digest/Millage Rate Statistics**
5. **CIP and 2017 SPLOST Projects**

SPLOST Implementation Overview (9:00am – 09:45am) – 45 minutes
Transportation Project Delivery Overview (09:45am – 10:30am) – 45 minutes
HB 316 Mandated Electronic Ballot Marking Device (10:30am – 11:00am) – 30 minutes
Employee Referral Program (11:00am – 11:30am) – 30 minutes

Lunch (11:30am – 12:30pm) – 1 hour

Executive Session (12:00pm-12:30pm)

Future Consideration & Direction
(1:00pm-4:00pm) – 30 minutes/per

1. **Public Safety Compensation Analysis**
2. **Municipal Growth Areas**
3. **Water System - Meter Replacement Options**
    a. Pay-As-You-Go; Realignment Leak Protection; Bond & GEFA Loan
4. **Water System – Interconnectivity – GEFA Redundancy/Reliability Act**
    a. Hydraulic Model; LT Demand Projection; Wholesale Rate & Safe Yield Analysis
5. **Signature Capital Project Overview**
    a. Public Safety Training Facility
    b. Water System - Water Selector Project
    c. Comprehensive Transportation Program

FAYETTE COUNTY, GEORGIA

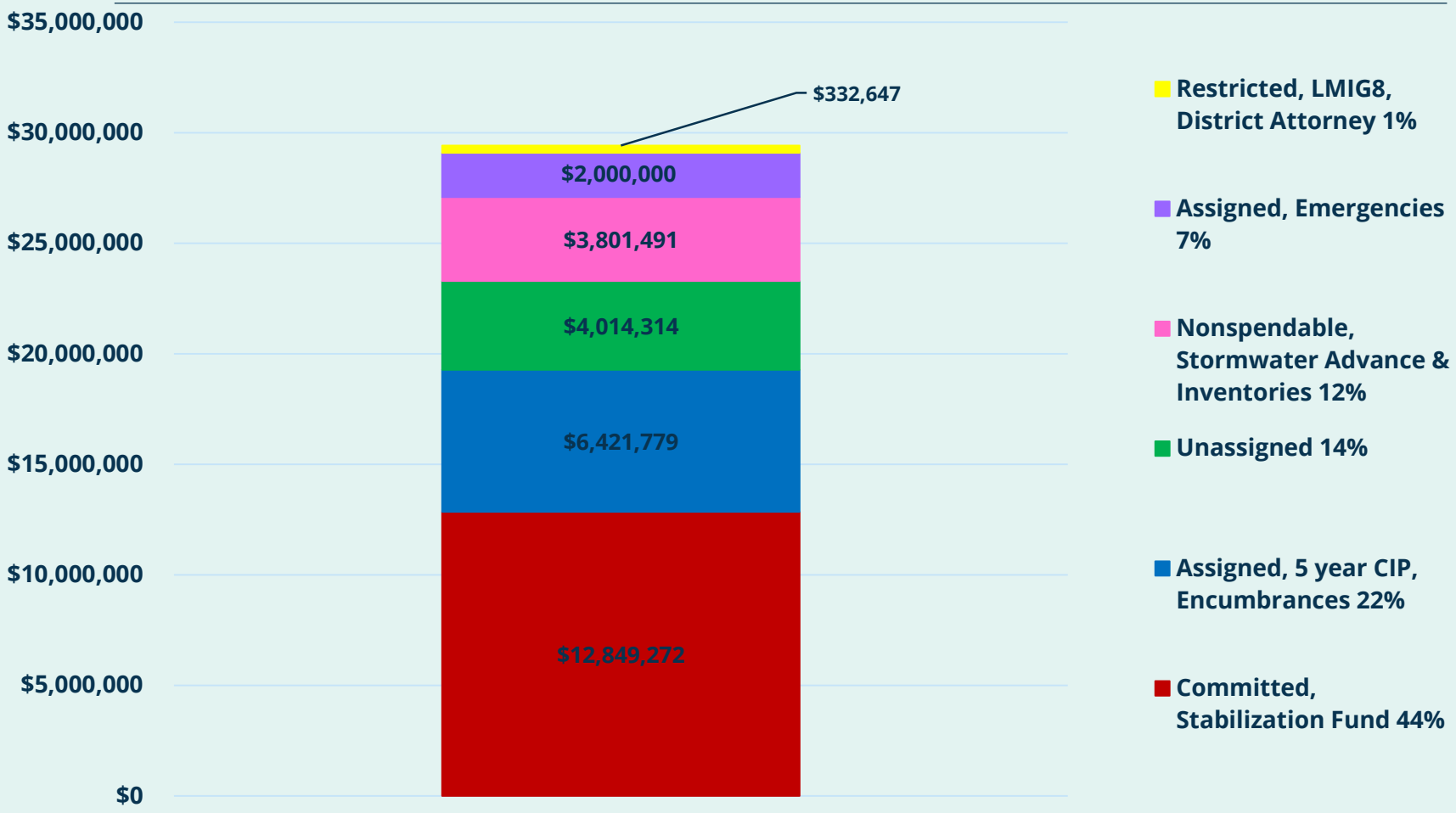
Financial Overview

BOARD OF COMMISSIONERS RETREAT

APRIL 5, 2019

Financial Review – General Fund

Fund Balance at June 30, 2018 - $29,419,503
Classification Breakdown Per GASB Statement No. 54



Financial Projections – FY 2019
General Fund - Revenues

OPERATING BUDGET	FY 2018 ACTUAL	FY 2019 ADJUSTED BUDGET	FY 2019 ESTIMATED*	BUDGET VS. EST. VARIANCE
Revenues:				over/(under)
Property Taxes	$ 26,294,291	$ 27,083,200	$ 27,160,869	$ 77,669
LOST / TAVT / Auto	16,158,190	17,249,262	17,300,000	50,738
Licenses and Permits	975,036	1,048,600	908,408	(140,192)
Intergovernmental	1,554,873	1,299,597	1,388,731	89,134
Charges for Services	3,317,113	3,319,195	3,263,703	(55,492)
Fines and Forfeitures	1,682,488	1,732,000	1,557,386	(174,614)
Other Revenues	433,905	949,800	1,139,900	190,100
Transfers In	198,702	83,512	83,512	(0)
Total Revenues	$ 50,614,598	$ 52,765,166	$ 52,802,510	$ 37,344

*Based Upon Actuals Through February 2019

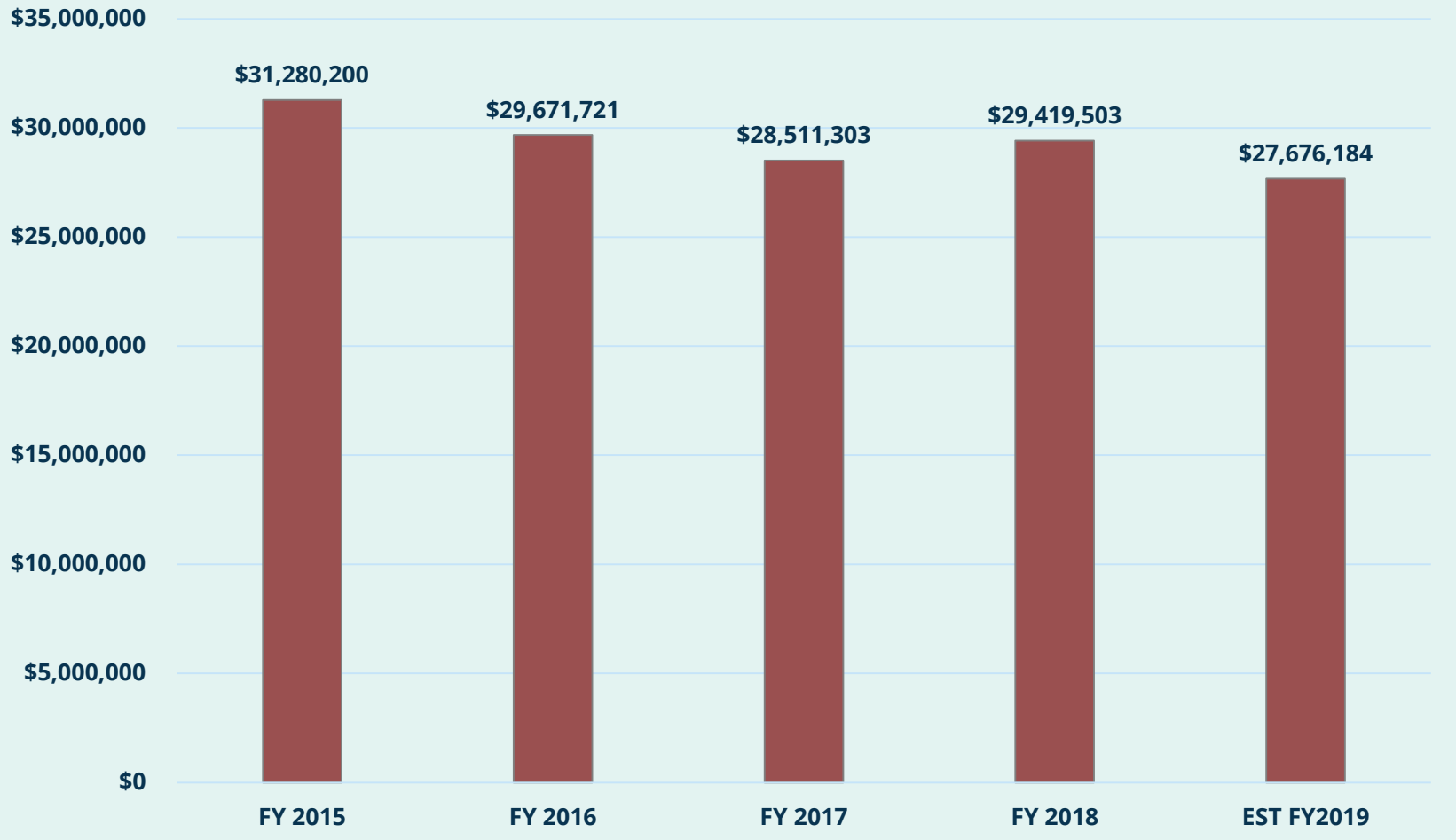
Financial Projections – FY 2019
General Fund – Expenditures

	FY 2018 ACTUAL	ADJUSTED BUDGET	FY 2019 ESTIMATED*	BUDGET VS. EST. VARIANCE (over)/under
Operating Expenditures:				
Current:				
General Government	$ 8,592,297	$ 9,537,503	$ 9,556,198	$ (18,695)
Judicial System	5,560,221	5,841,439	5,868,886	(27,447)
Public Safety	20,325,379	20,631,910	20,433,774	198,136
Public Works	6,396,725	7,424,327	7,234,416	189,911
Health and Welfare	843,841	860,423	860,333	90
Culture and Recreation	2,219,562	2,430,634	2,406,804	23,830
Housing and Development	1,340,112	1,521,926	1,487,863	34,063
Contingency	-	32,298	32,298	-
Debt Service	3,260,006	3,263,306	3,263,306	-
Transfers - Jail Surcharge	61,000	-	-	-
Total Operating Expenditures	$ 48,599,143	$ 51,543,766	$ 51,143,878	$ 399,888
Net Operations	$ 2,015,455	$ 1,221,400	$ 1,658,632	$ 437,231
CAPITAL BUDGET				
Transfers Out - Capital Projects	1,107,255	3,401,949	3,401,949	-
Sub-total Expenditures	49,706,398	54,945,715	54,545,827	399,888
Impact to Fund Balance	**$ 908,200**	**$ (2,180,550)**	**$ (1,743,319)**	**$ 437,231**

*Based Upon Actuals Through February 2019

$40,000 to be requested at April 23rd BOC meeting

Fund Balance Trends
General Fund



Fayette County, Georgia

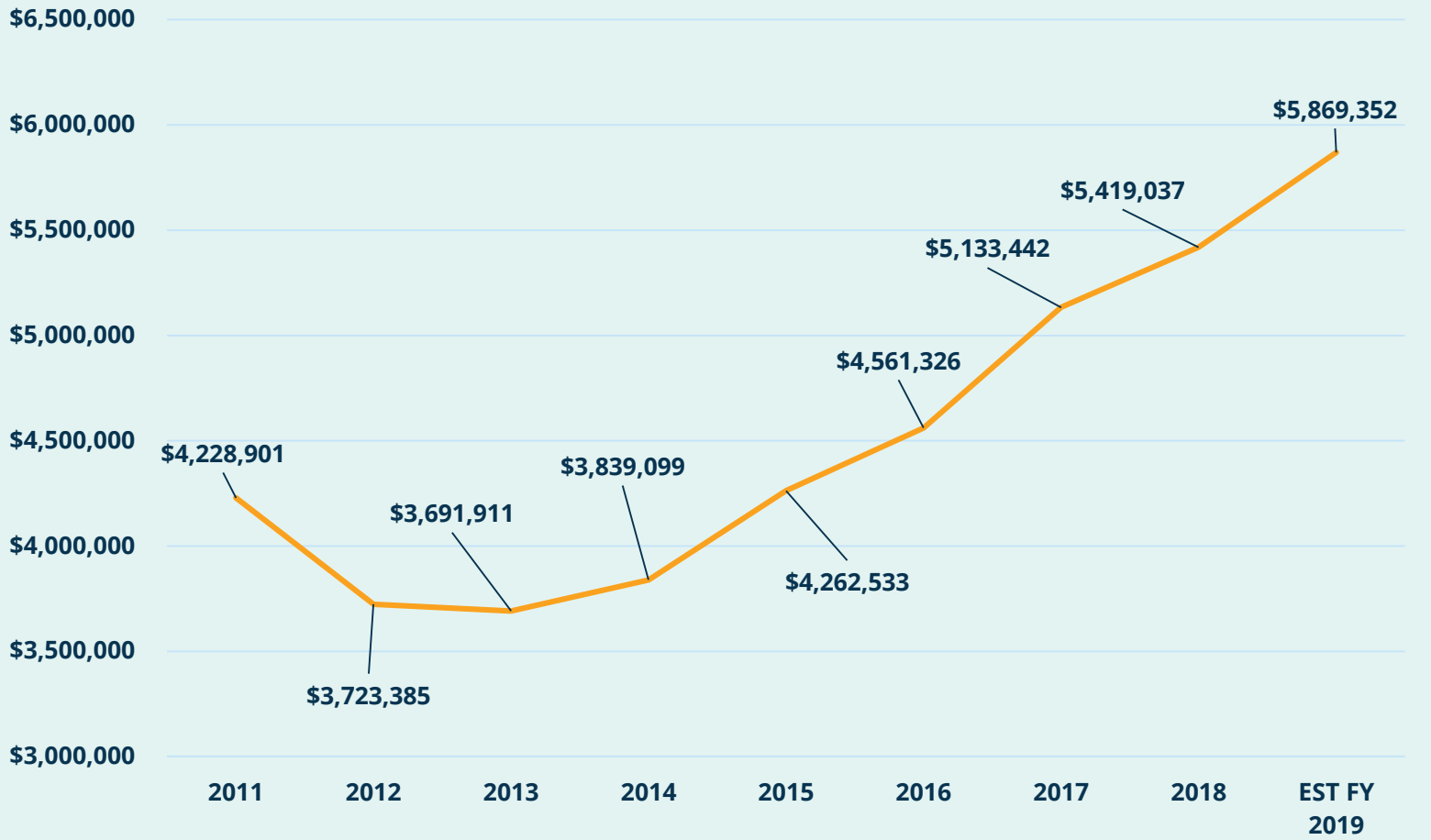
-Property Digest History

-Motor Vehicle/Ad Valorem Auto Tax/TAVT Sales Tax

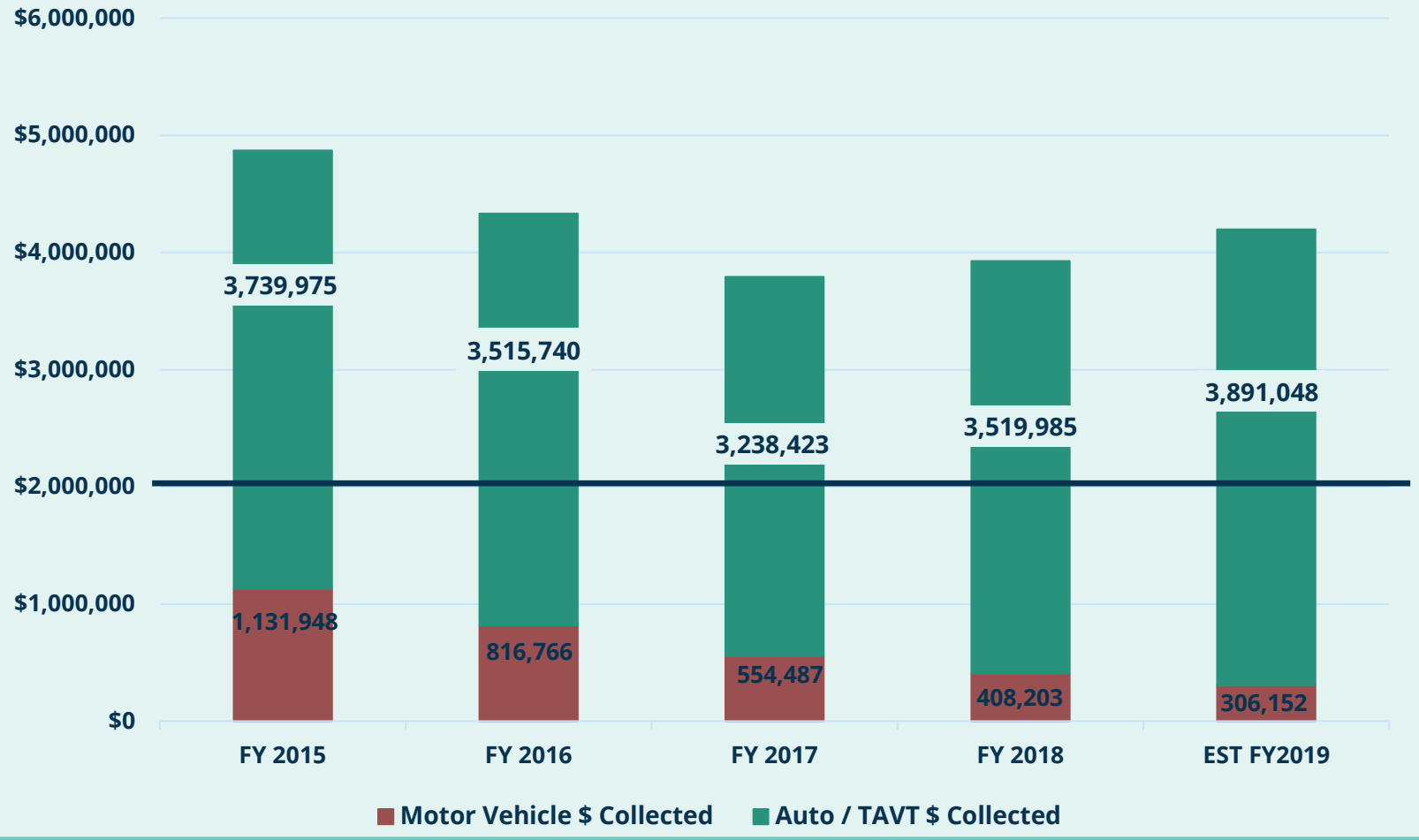
-Local Option Sales Tax/ Special Local Option Sales Tax

Real Property Digest

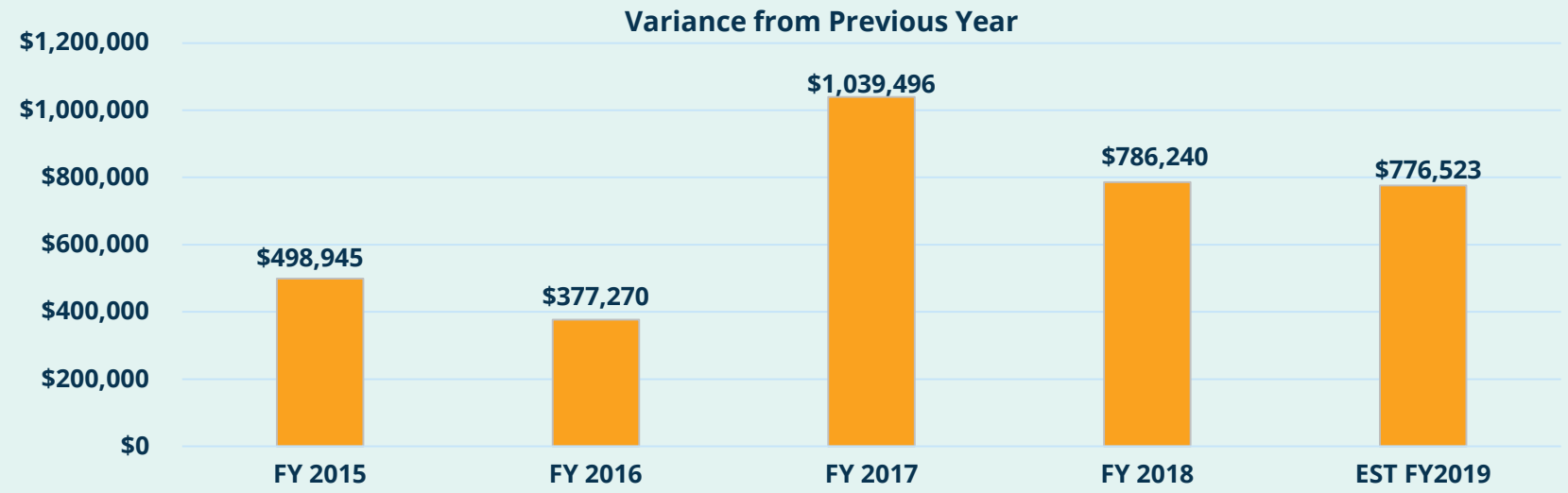
(Net of Exemptions) in thousands

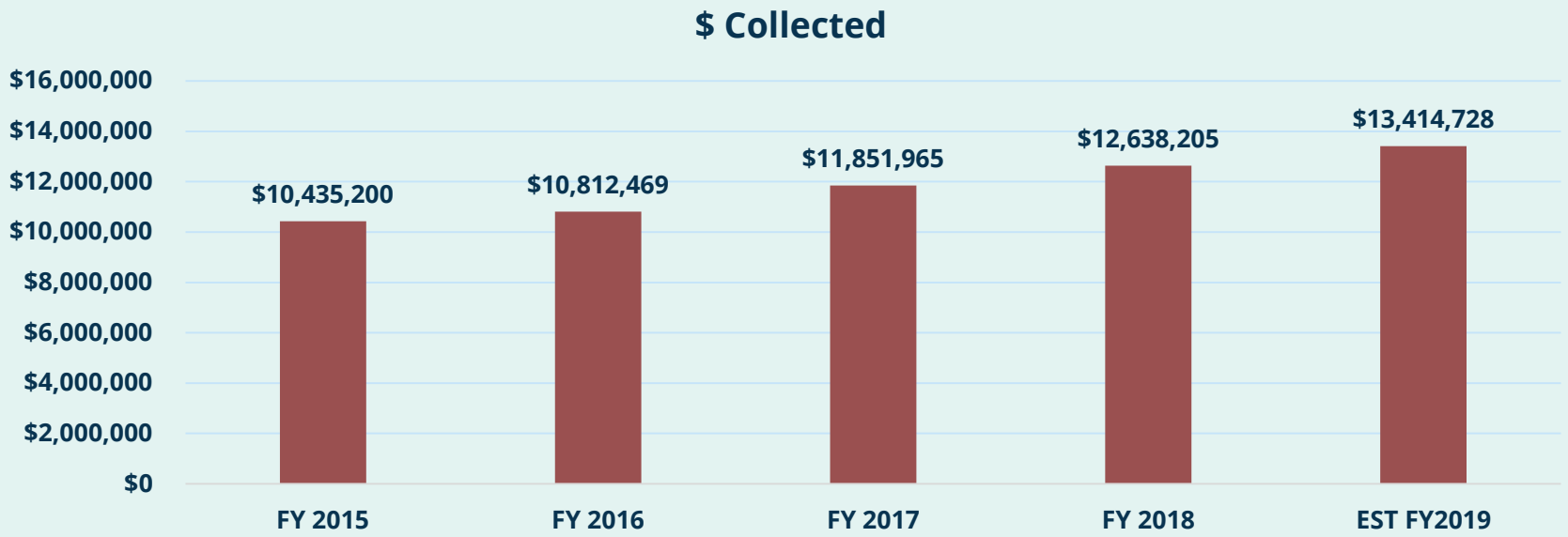


Motor Vehicles vs. Auto/TAVT $ Collected

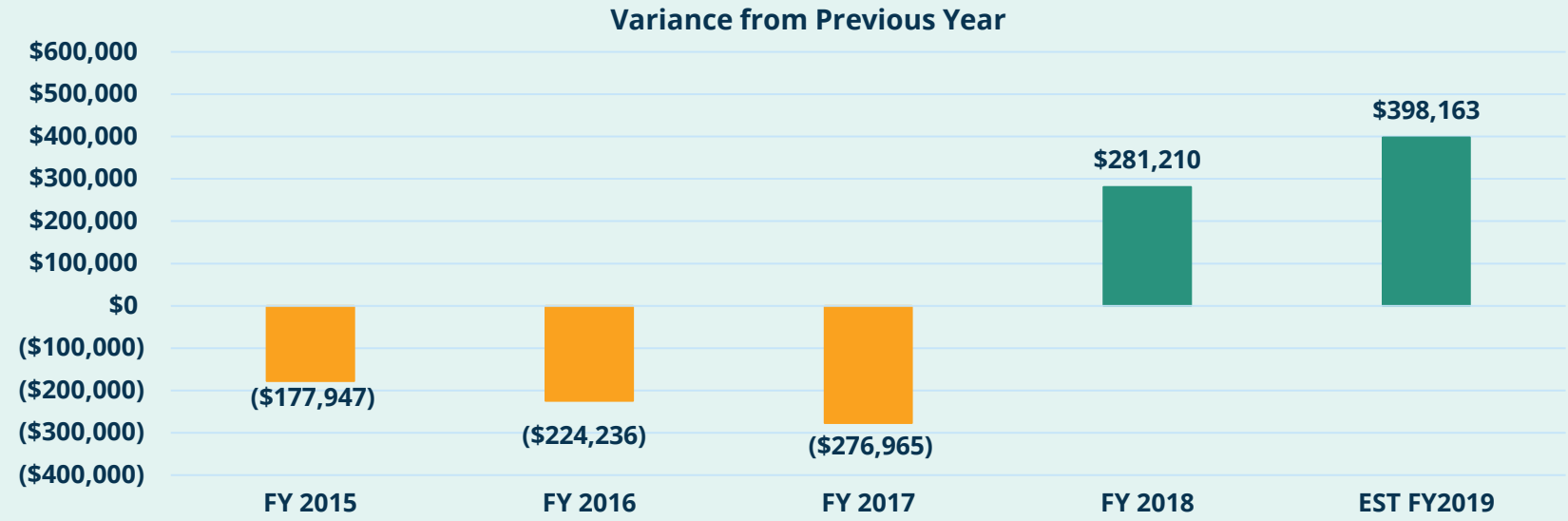


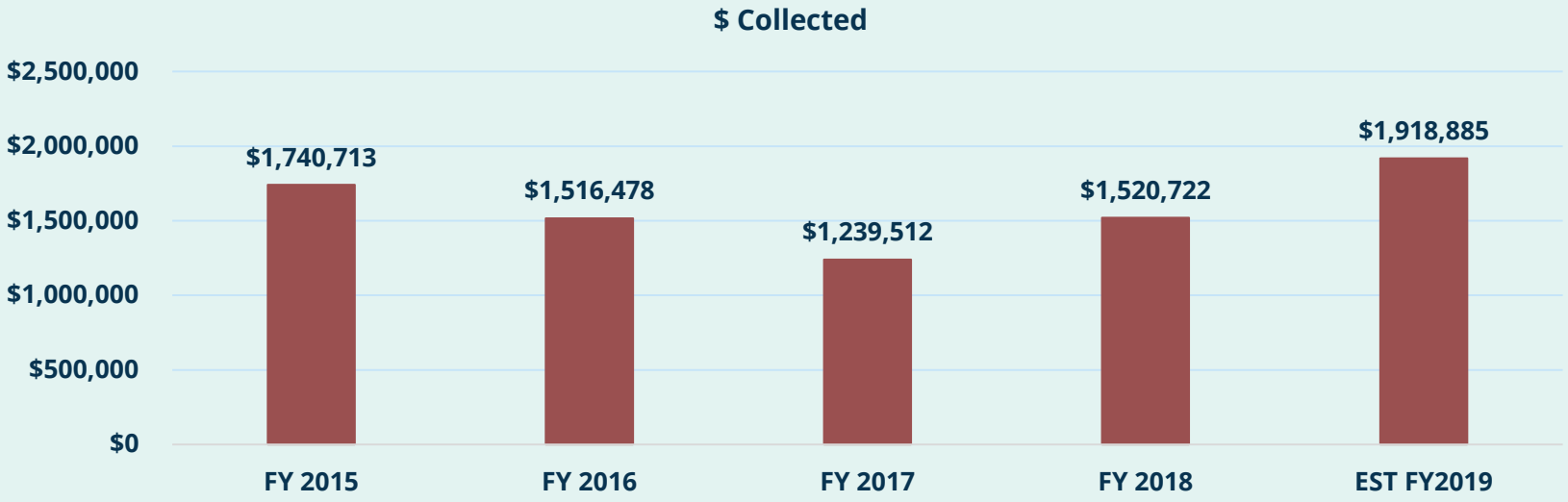
LOST Revenues





TAVT Revenues





2017 SPLOST Revenues

Sales Month	*FY 2018*	*FY 2019*	% Change
July	2,070,274.29	2,550,150.53	23.18%
August	2,057,236.66	1,981,872.79	-3.66%
September	2,069,717.99	1,990,556.48	-3.82%
October	1,910,760.57	2,121,207.95	11.01%
November	2,151,202.62	2,100,147.89	-2.37%
December	2,512,671.90	2,834,362.36	12.80%
January	1,840,309.31	2,308,534.44	25.44%
February	1,635,758.15	1,843,754.42	12.72%
March	2,785,690.32		
April	2,025,017.23		
May	2,033,056.28		
June	2,024,709.00		
Pro Rata	1,573.57	12,163.25	
	25,117,977.89	***17,742,750.11***	
Cumulative YTD*	**16,247,931.49**	**17,730,586.86**	**9.13%**

* July 2018- February 2019 excluding pro rata

FY2019 Distribution

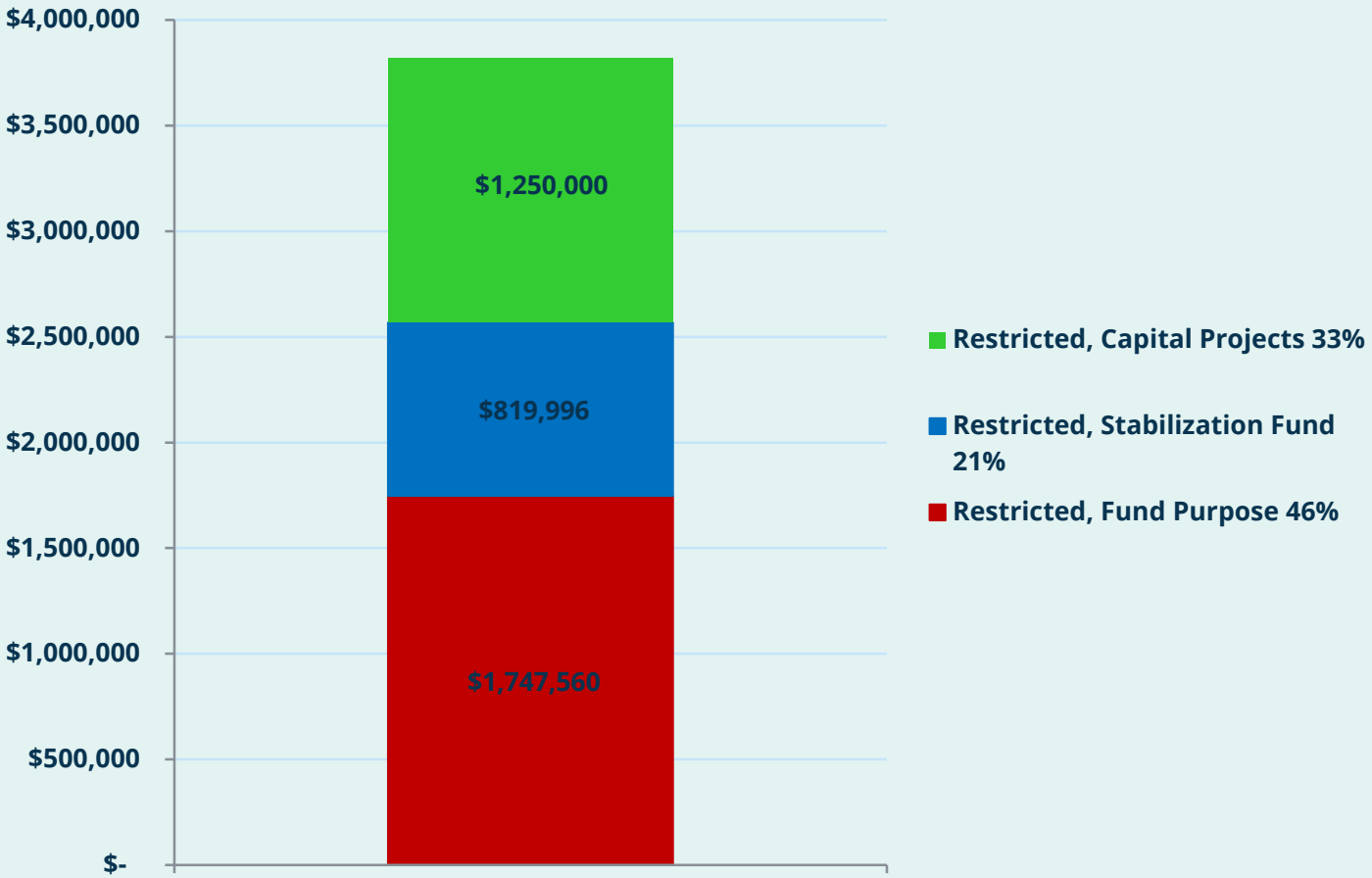
45.844%	***14.962%***	***32.247%***	***6.455%***	***0.492%***
FC	***Fayetteville***	***PTC***	***Tyrone***	***Brooks***
$1,169,091.01	$381,553.52	$822,347.04	$164,612.22	$12,546.74
$908,569.76	$296,527.81	$639,094.52	$127,929.89	$9,750.81
$912,550.71	$297,827.06	$641,894.75	$128,490.42	$9,793.54
$972,446.57	$317,375.14	$684,025.93	$136,923.97	$10,436.34
$962,791.80	$314,224.13	$677,234.68	$135,564.55	$10,332.73
$1,299,385.08	$424,077.30	$913,996.83	$182,958.09	$13,945.06
$1,058,324.53	$345,402.92	$744,433.10	$149,015.90	$11,357.99
$845,250.78	$275,862.54	$594,555.49	$119,014.35	$9,071.27
$5,576.12	$1,819.88	$3,922.27	$785.14	$59.84
8,133,986.36	***2,654,670.29***	***5,721,504.61***	***1,145,294.52***	***87,294.33***

Fayette County, Georgia

Financial Review
Special Revenue Funds

Financial Review – 911 Special Revenue Fund

Fund Balance at June 30, 2018- $3,817,556

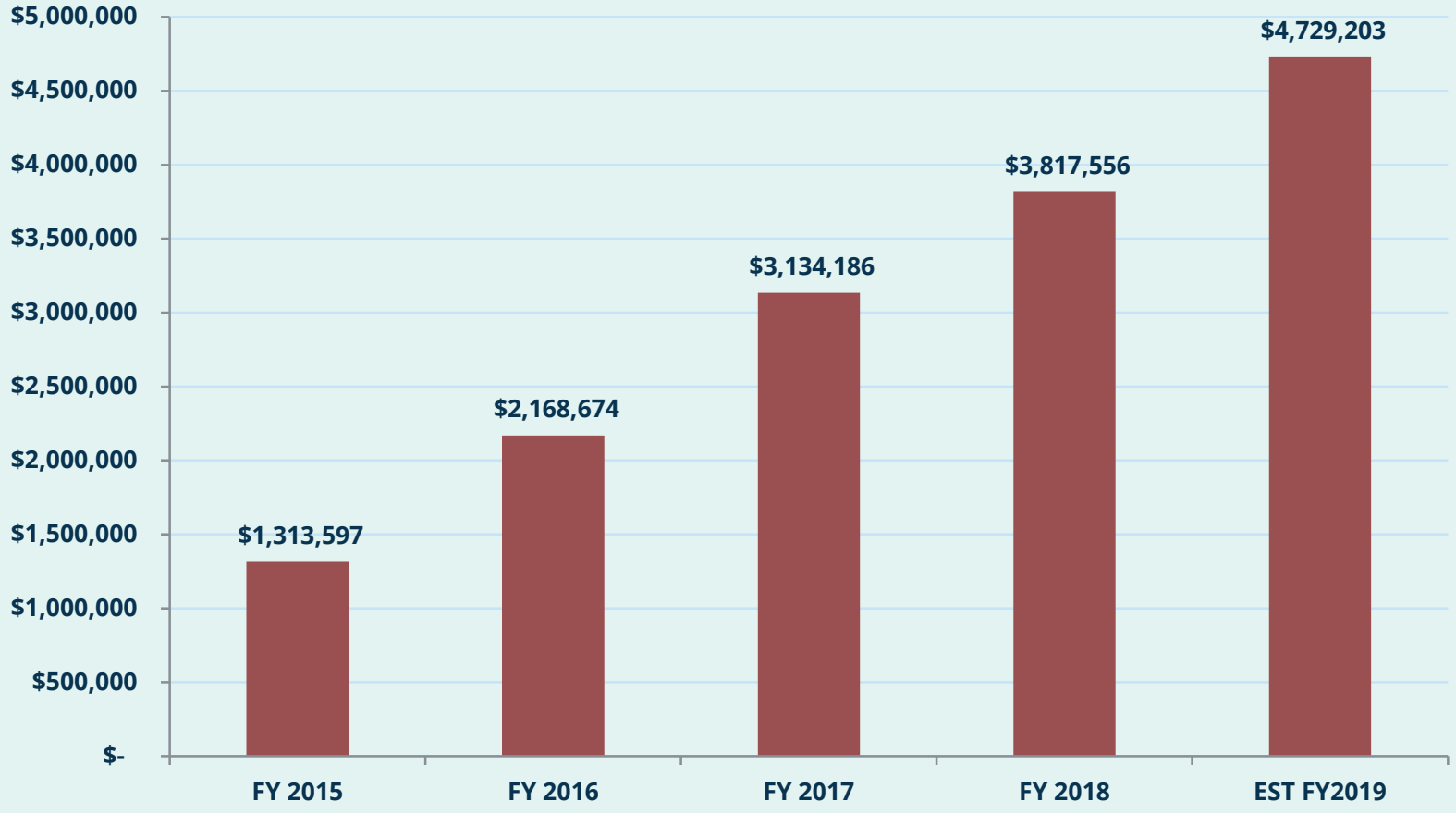


Financial Projections – FY 2019
911 Special Revenue Fund

OPERATING BUDGET	FY 2018 ACTUAL	FY 2019 ADJUSTED BUDGET	FY 2019 ESTIMATED*	BUDGET VS. EST. VARIANCE
Revenues:				over / (under)
Property Taxes	$ 1,175,792	$ 1,197,400	$ 1,237,052	$ 39,652
Other Taxes	9,872	26,200	54,646	28,446
Telephone Surcharge (Landline)	211,385	200,000	186,511	(13,489)
Wireless Surcharge	2,198,666	2,200,000	2,222,094	22,094
PrePaid Wireless 911 Charges	161,357	225,000	410,639	185,639
Intergovernmental	-	-	2,621	2,621
Total Revenues	$ 3,757,071	$ 3,848,600	$ 4,113,562	$ 264,962
Operating Expenditures:				
Current:				(over) / under
Public Safety	$ 3,073,701	$ 3,279,986	$ 3,201,915	$ 78,071
Total Operating Expenditures	$ 3,073,701	$ 3,279,986	$ 3,201,915	$ 78,071
Net Operations	$ 683,370	$ 568,614	$ 911,647	$ 343,033
CAPITAL BUDGET				
Transfers Out - Capital Projects	-	-	-	-
Impact to Fund Balance	**$ 683,370**	**$ 568,614**	**$ 911,647**	**$ 343,033**

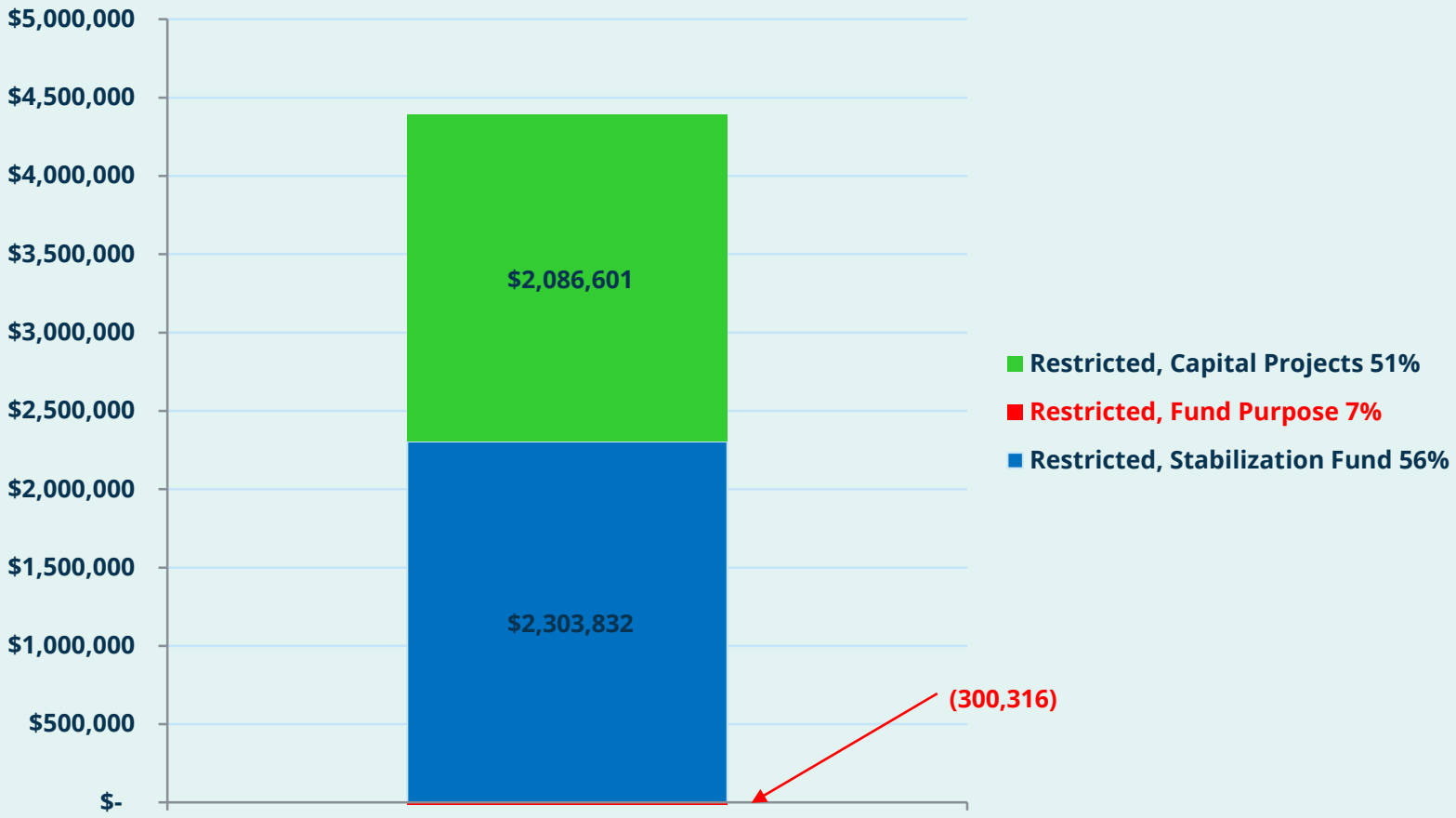
* Based Upon Actuals Through February 2019

Fund Balance Trends
911 Special Revenue Fund



Financial Review – Fire Services Special Revenue Fund

Fire Fund Balance as of June 30, 2018 -$4,090,117

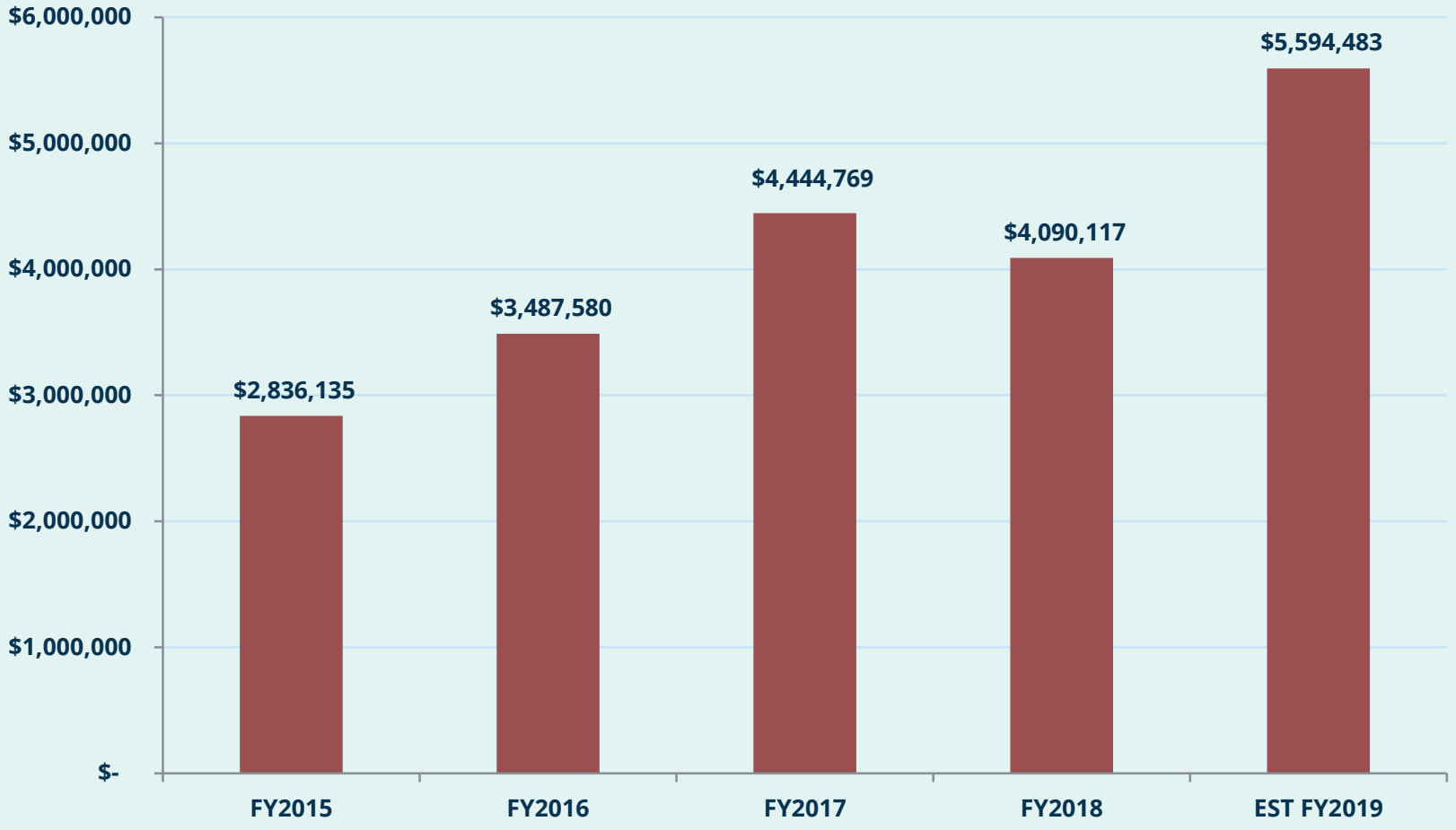


Financial Projections – FY 2019
Fire Services Special Revenue Fund

	FY 2018 ACTUAL	FY 2019 ADJUSTED BUDGET	FY 2019 ESTIMATED*	BUDGET VS. EST. VARIANCE
OPERATING BUDGET				
Revenues:				over / (under)
Property Taxes	$ 7,819,538	$ 7,886,000	$ 8,157,324	$ 271,324
Other Taxes	2,915,469	3,263,000	3,317,730	54,730
Intergovernmental	-	42,800	54,469	11,669
Charges for Services	187,722	204,000	160,978	(43,022)
Miscellaneous	111,419	94,600	153,726	59,126
Transfers In	4,800	63,983	63,983	-
Total Revenues	$ 11,038,948	$ 11,554,383	$ 11,908,209	$ 353,826
Operating Expenditures:				
Current:				(over) / under
Public Safety	$ 8,522,216	$ 8,848,571	$ 8,892,919	$ (44,348)
Public Safety Overtime	445,005	371,093	448,224	(77,131)
Total Operating Expenditures	$ 8,967,221	$ 9,219,664	$ 9,341,143	$ (121,479)
Net Operations	$ 2,071,728	$ 2,334,719	$ 2,567,066	$ 232,347
CAPITAL BUDGET				
Transfers Out - Capital Projects	2,426,380	1,062,700	1,062,700	-
Impact to Fund Balance	**$ (354,652)**	**$ 1,272,019**	**$ 1,504,366**	**$ 232,347**

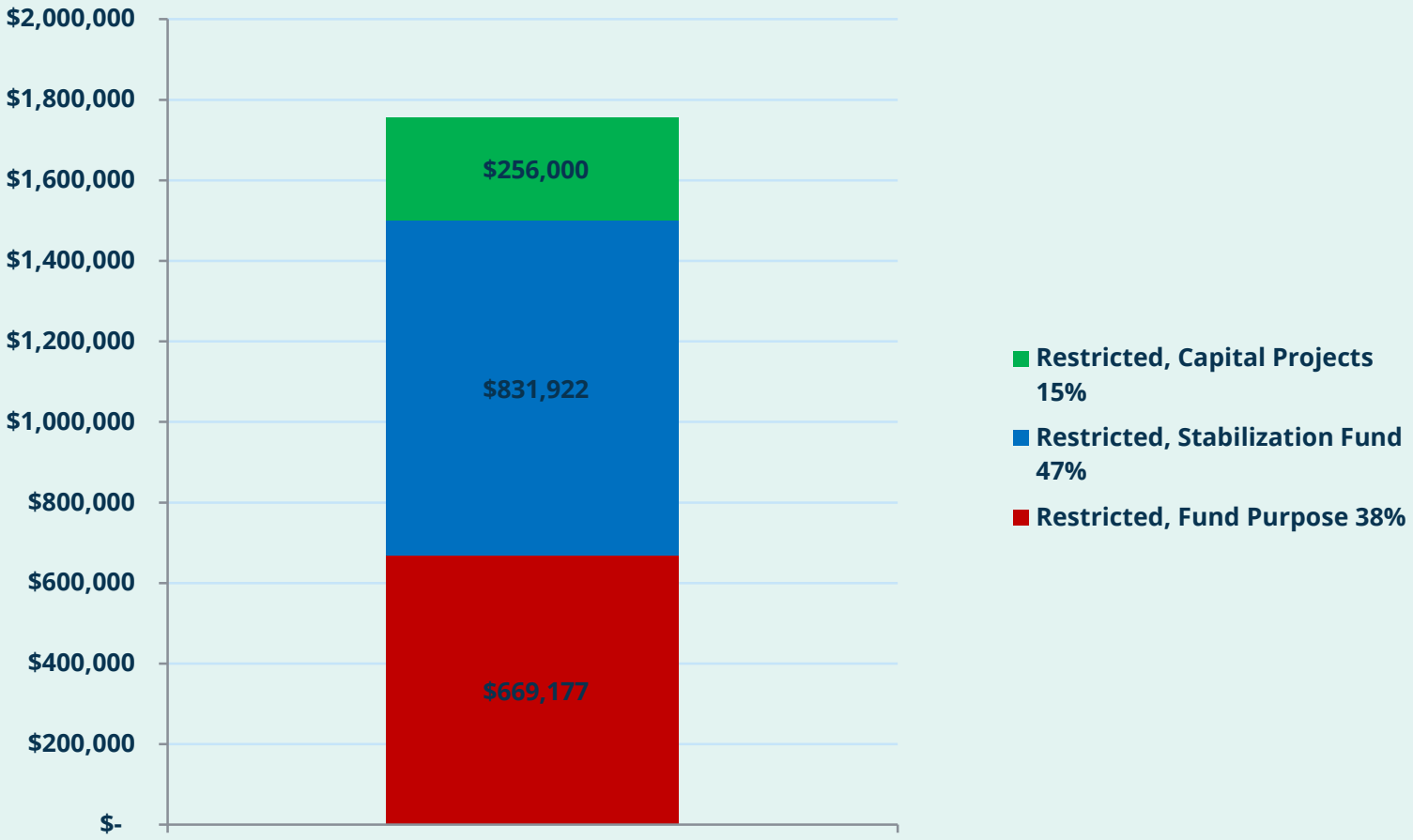
*Based Upon Actuals Through February 2019

Fund Balance Trends
Fire Services Special Revenue Fund



Financial Review – EMS Special Revenue Fund

Fund Balance as of June 30, 2018- $1,757,099

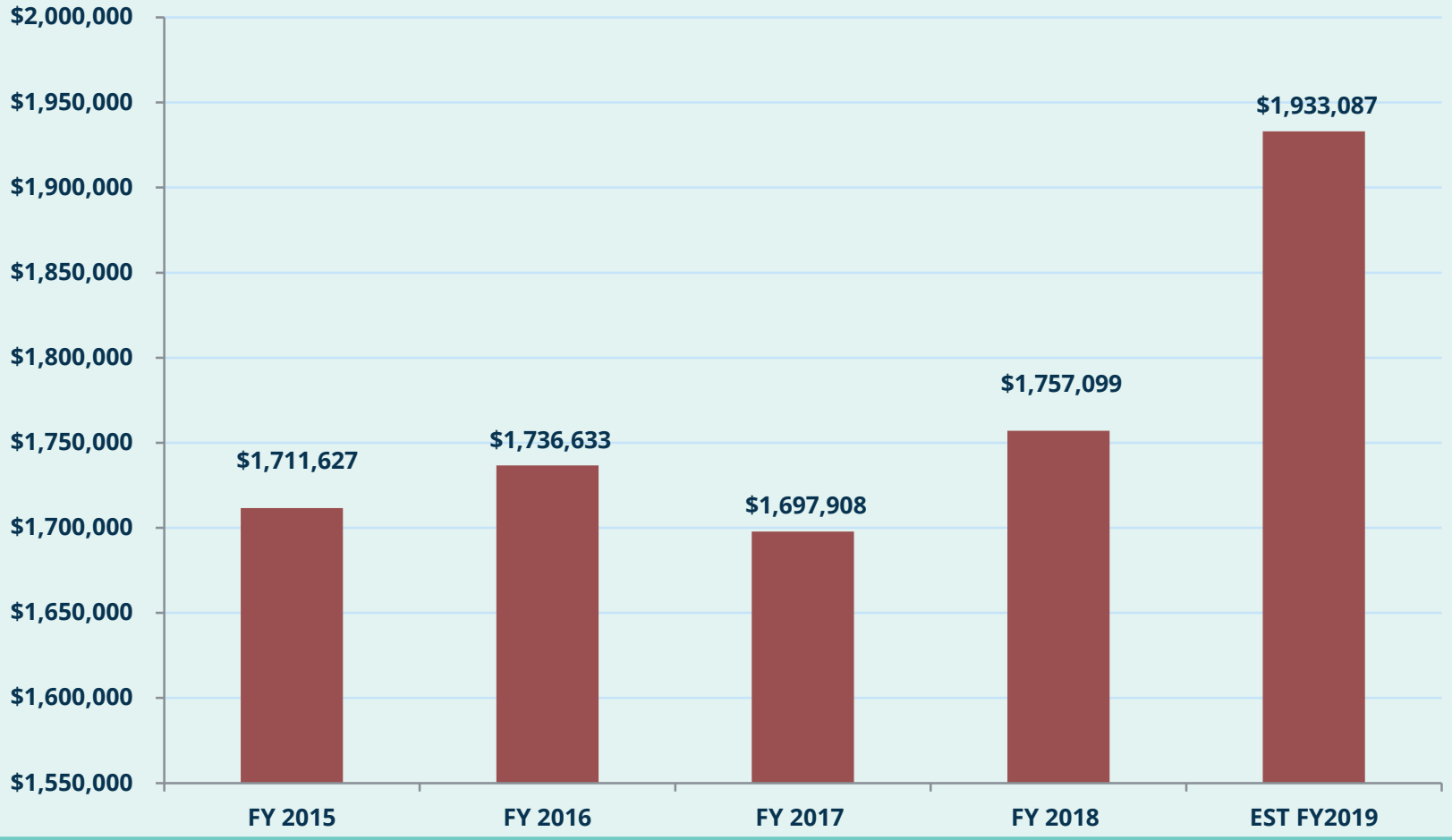


Financial Projections – FY 2019
EMS Special Revenue Fund

	FY 2018 ACTUAL	FY 2019 ADJUSTED BUDGET	FY 2019 ESTIMATED*	BUDGET VS. EST. VARIANCE
OPERATING BUDGET				
Revenues:				over / (under)
Property Taxes	$ 1,523,438	$ 1,614,000	$ 1,625,032	$ 11,032
Other Taxes	38,812	35,800	37,194	1,394
Intergovernmental	12,091	-	10,791	10,791
Charges for Services	1,803,829	2,020,000	1,770,128	(249,872)
Miscellaneous	5,943	1,000	4,280	3,280
Transfers In	7,200	-	-	-
Total Revenues	$ 3,391,315	$ 3,670,800	$ 3,447,425	$ (223,375)
Operating Expenditures:				
Current:				(over) / under
Public Safety	$ 3,181,351	$ 3,327,687	$ 3,021,437	$ 306,250
Total Operating Expenditures	$ 3,181,351	$ 3,327,687	$ 3,021,437	$ 306,250
Net Operations	$ 209,964	$ 343,113	$ 425,988	$ 82,875
CAPITAL BUDGET				
Transfers Out - Capital Projects	150,000	250,000	250,000	-
Impact to Fund Balance	**$ 59,964**	**$ 93,113**	**$ 175,988**	**$ 82,875**

*Based Upon Actuals Through February 2019

Fund Balance Trends
EMS Special Revenue Fund



Fayette County, Georgia

Other Operating Funds Statistics

Financial Activity
County Jail Surcharge Fund

Average Daily Population:	263	281	296	273	240
Revenues:	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**	**FY 2019 ESTIMATED***
Fine Surcharges - County Jail					
Fayetteville	$68,672	$77,811	$74,147	$61,908	$86,767
Peachtree City	124,937	95,069	92,725	106,340	90,234
Tyrone	28,268	25,898	25,920	21,652	24,696
County	134,221	162,916	179,127	158,954	130,953
Total Surcharges	356,098	361,693	371,919	348,854	332,650
Transfers From General Fund	-	40,000	40,000	61,000	
Total Revenues	$356,098	$401,693	$411,919	$409,854	$332,650
Expenditures:					
Inmate Meals	394,322	412,551	426,321	412,663	375,691
Total	$394,322	$412,551	$426,321	$412,663	$375,691
Revenues Over (Under)	(38,224)	(10,858)	(14,402)	(2,809)	(43,042)
Fund Balance, Beginning	$90,293	$52,069	$41,211	$26,809	$24,000
Fund Balance, Ending	$52,069	$41,211	$26,809	$24,000	($19,042)

$40,000 to be requested at April 23rd BOC meeting

Proprietary Funds
Summary of Net Assets

Water System

	FY 2016	FY 2017	FY 2018	YTD FY 2019*
Net Assets:				
Invested In Capital Assets,				
Net of Related Debt	$62,610,973	$67,192,871	$67,376,464	$68,544,341
Restricted For:				
Debt Service	8,742,170	8,856,453	8,884,323	7,382,051
Bond Funds	2,742,781	570,016	514,062	514,600
CIP	4,070,514	3,202,129	2,375,556	4,027,551
Net Renewal and Extension	3,061,569	5,669,110	5,611,087	5,913,895
Total Net Assets	$81,228,007	$85,490,579	$84,761,492	$86,382,439

Solid Waste

Net Assets:				
Invested In Capital Assets,				
Net of Related Debt	$127,348	$178,357	$193,378	$183,918
Unrestricted	464,861	330,373	142,414	169,856
Total Net Assets	$592,209	$508,730	$335,792	$353,774

*YTD - February 2019

Fayette County, Georgia

Internal Service Funds Statistics

Self-Insurance Fund
Workers' Compensation

	FY 2015	FY 2016	FY 2017	FY2018	FY2019 ESTIMATED
Revenues					
Charges for Services Original Budget	$415,000	$470,000	$330,532	$600,000	$500,000
Funding for Settlements	818,690	-	698,000	339,600	0
Total Revenues	$1,233,690	$470,000	$1,028,532	$939,600	$500,000
Expenses					
Cost of Claims	276,128	567,162	381,510	563,543	500,574
WC Settlements	197,500	327,790	190,500	187,600	362,334
Administration	131,638	154,374	154,764	176,569	144,845
Total Expenses	605,266	1,049,326	726,774	927,711	1,007,753
Change in Net Position	$628,424	($579,326)	$301,758	$11,889	($507,753)
Total Net Position- beginning	71,575	700,000	120,674	422,432	434,321
Total Net Position- ending	$700,000	$120,674	$422,432	$434,321	($73,432)

$230,000 will be requested at April 23rd BOC meeting

Self-Insurance Fund
Major Medical

	FY2015	FY2016	FY2017	FY2018	FY2019 ESTIMATED
Revenues	6,657,684	7,137,734	7,436,258	7,850,274	8,091,767
CIGNA StopLoss *	-	1,207,618	-	2,023,509	1,500,000
Total Revenues	6,657,684	$8,345,352	$7,436,258	$9,873,782	$9,591,767
Expenses					
Cost of Claims	5,746,127	7,910,551	7,172,363	9,284,441	8,520,995
Administration	472,507	485,473	498,189	568,659	598,532
Total Expenses	$6,218,634	8,396,024	$7,670,552	$9,853,100	$9,119,527
Change in Net Position	$439,050	($50,672)	($234,294)	$20,683	$472,240
Total Net Position- beginning	$689,270	$1,128,320	$1,077,648	$843,354	$864,036
Total Net Position- ending	$1,128,320	$1,077,648	$843,354	$864,036	$1,336,276
Stabilization	$126,400	$576,400	$576,400	$576,400	$576,400

*Anticipated amount for 2019

Self-Insurance Fund
Dental / Vision

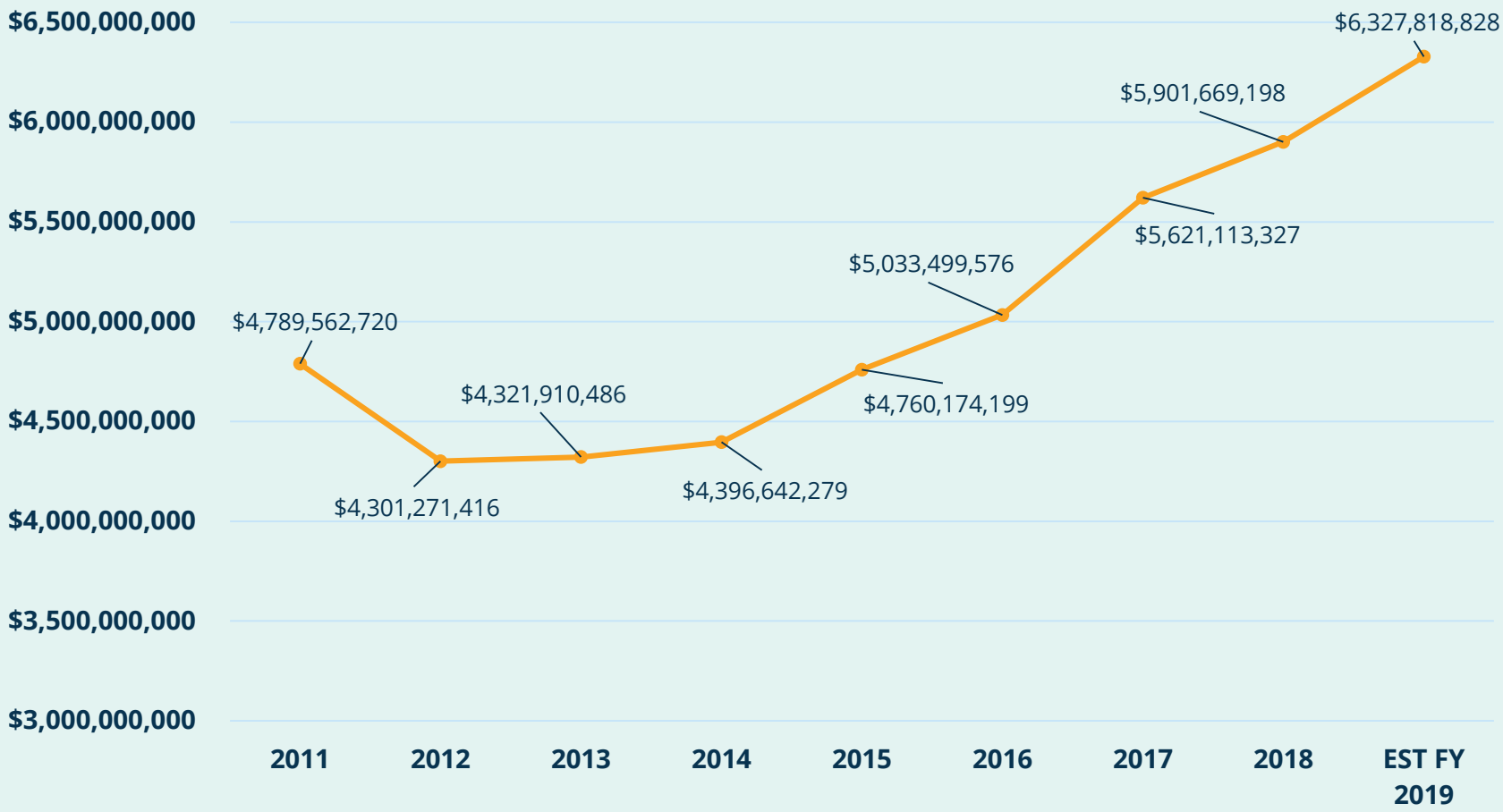
	FY2015	FY2016	FY2017	FY2018	FY2019 ESTIMATED
Revenues	$442,049	$477,433	$507,322	$485,857	$502,929
Additonal Funding		-	-	-	0
Total Revenues	$442,049	$477,433	$507,322	$485,857	$502,929
Expenses					
Cost of Claims	456,797	493,765	556,986	526,942	549,851
Total Expenses	456,797	493,765	556,986	526,942	549,851
Change in Net Position	($14,748)	($16,332)	($49,664)	($41,085)	($46,922)
Total Net Position- beginning	$137,691	$122,943	$106,612	$56,948	$15,863
Total Net Position- ending	$122,943	$106,611	$56,948	$15,863	($31,059)

$40,000 will be requested at April 23rd BOC meeting

Fayette County, Georgia

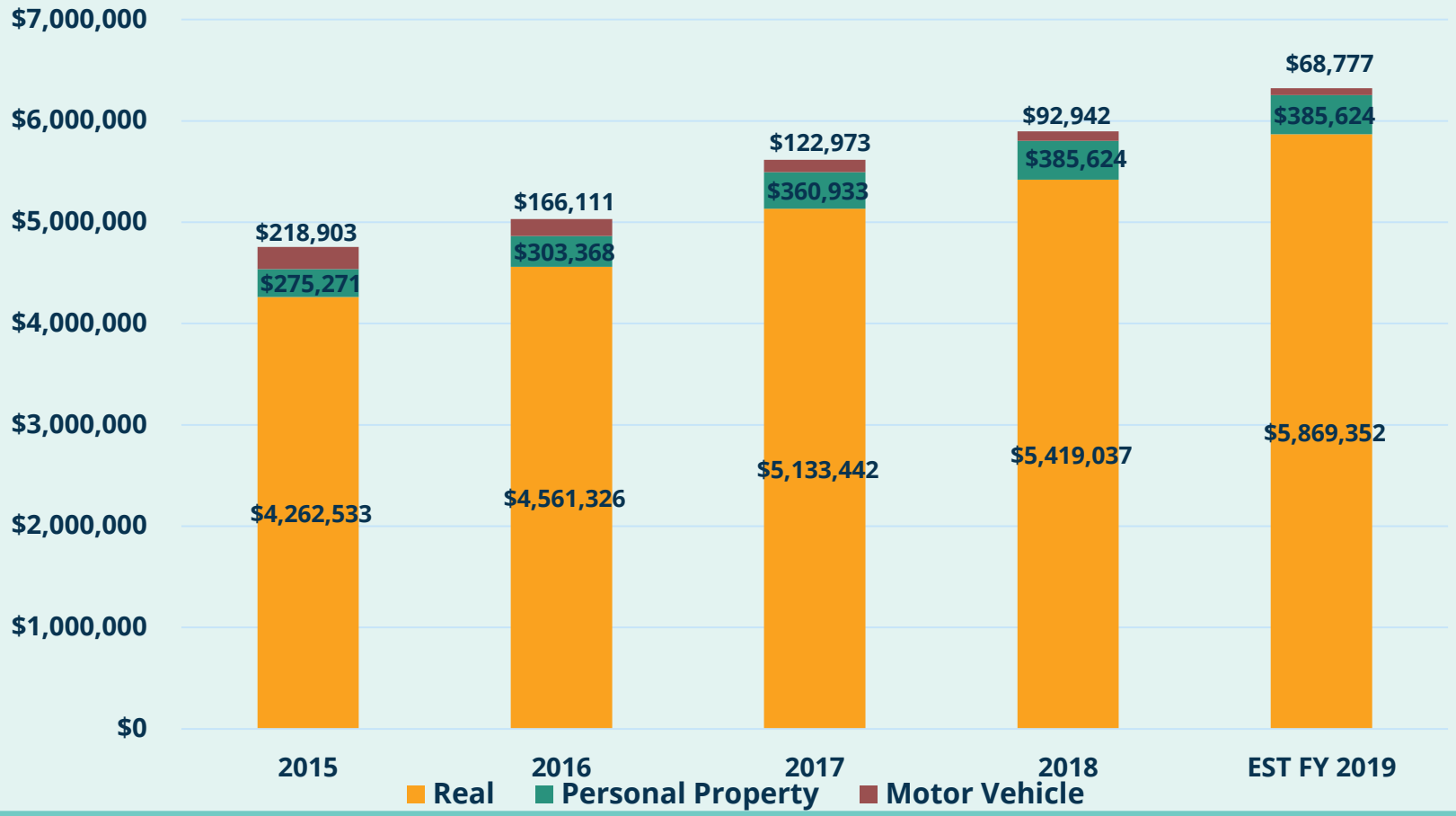
Tax Digest / Millage Rates Statistics

Net M&O Tax Digest Trends

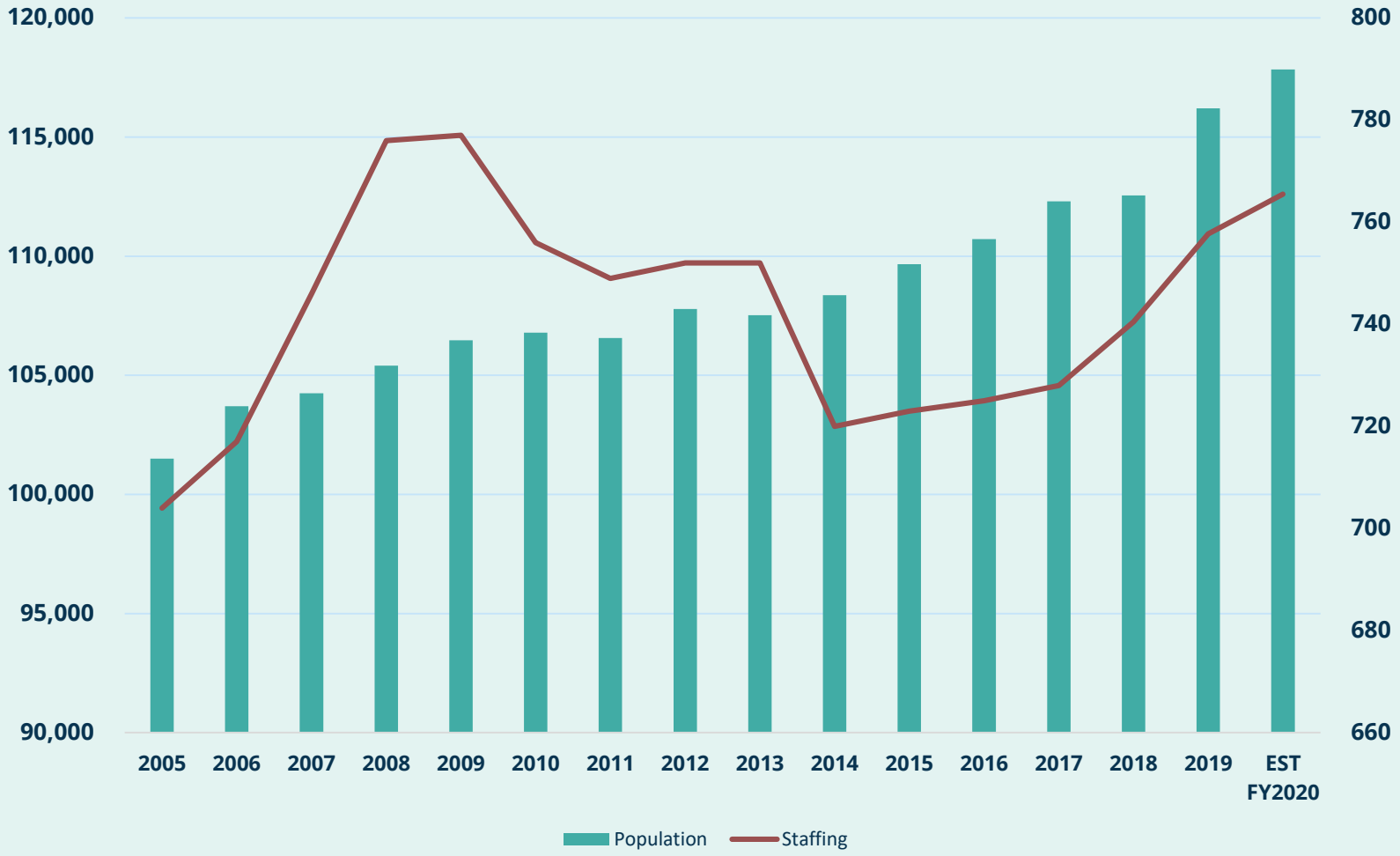


Tax Digest

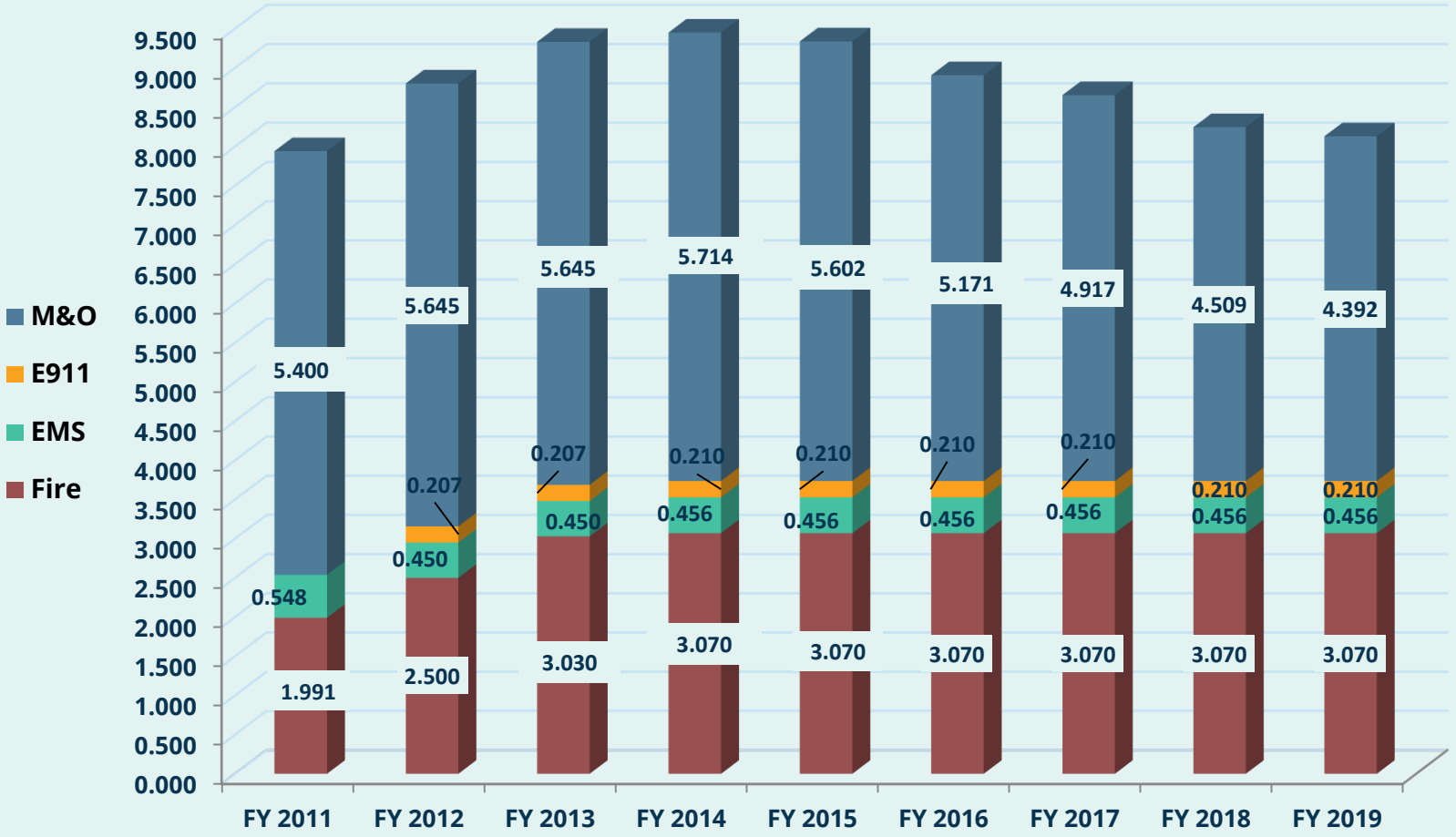
(Net of Exemptions) in thousands



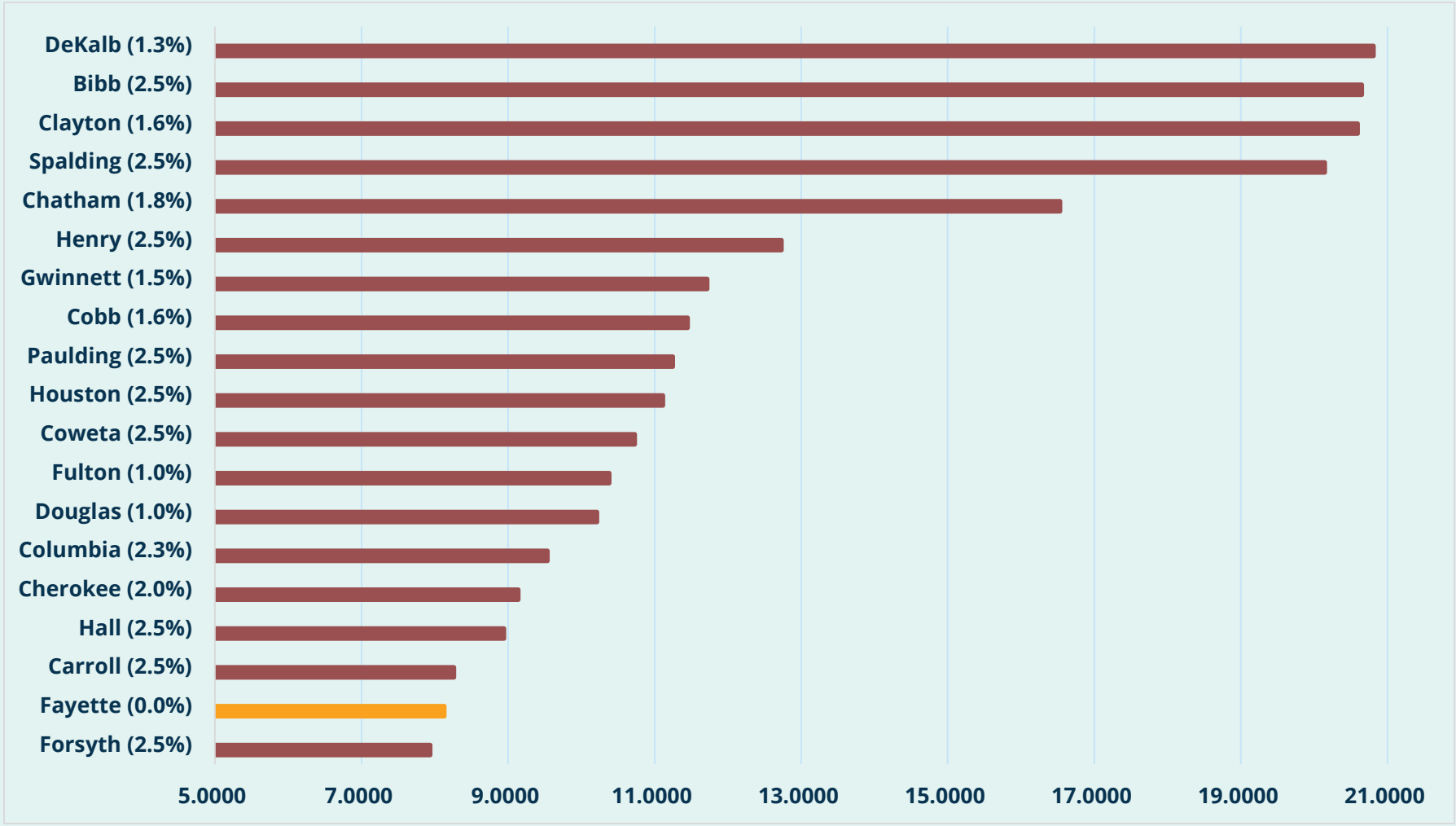
Population and Staffing



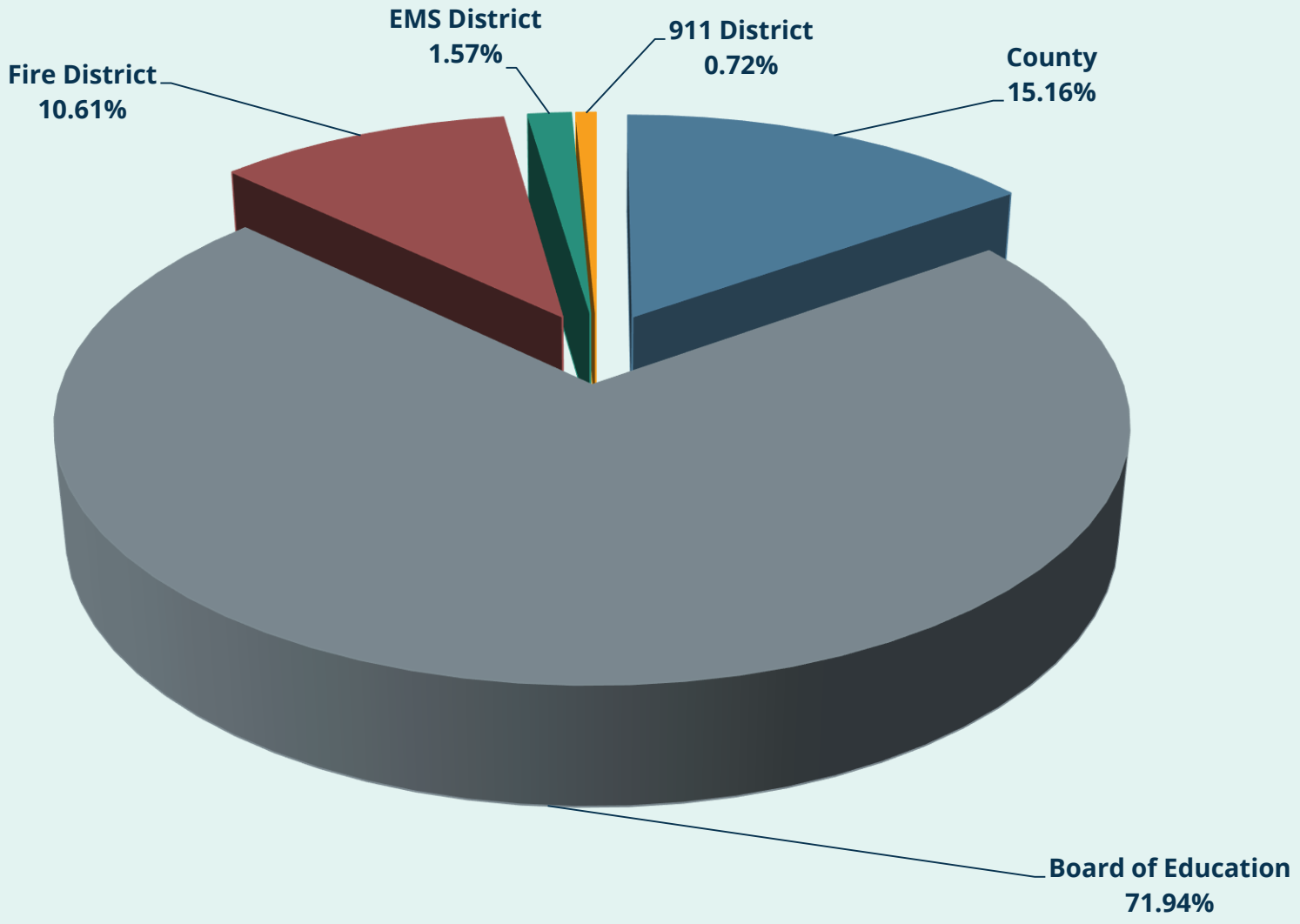
Millage Rates for Fayette County



Millage Rates for Local Counties



Property Tax Dollars



Financial Impact to General Fund Maintenance & Operations
Rollback vs. No Rollback

Year	M&O Millage	Annual Rollback Loss Compared to Prior Year's Millage Rate	Cumulative Rollback Loss Compared to 2014 Millage Rate
2014	5.714	-	-
2015	5.602	$0.5M	$0.5M
2016	5.171	$2.1M	$2.6M
2017	4.917	$1.3M	$4.0M
2018	4.509	$2.3M	$6.8M
2019	4.392	$0.7M	$7.8M
			$21.7M

Fayette County, Georgia

CIP & 2017 SPLOST Projects

FY 2019
CIP Projects- Active

Project Name	Lead Department	Approved Budget To Date	Expenditures as of 03/21/2019 (From Finance)	Available Budget	Percent Spent
Adoption Bonding Area	Animal Control	$15,000		$15,000	
Countywide Public Art	BOC	$75,000	$15,990	$59,010	21%
Roof Repairs - Admin Building	B&G	$426,058	$310,618	$115,440	73%
Stonewall Building Refurbishment	B&G	$277,950	$269,376	$8,574	97%
LED Lighting Project - Sheriff & Justice Center	B&G	$37,500		$37,500	
Animal Shelter Renovation	B&G	$190,000	$121,784	$68,216	64%
Public Works Admin Renovation	B&G	$15,000	$3,158	$11,842	21%
Heritage Park Water Fountain	B&G	$125,000	$55,668	$69,332	45%
Historic Courthouse Interior Refurbishment	B&G	$30,000	$20,952	$9,048	70%
Stonewall Renovation (including Fleet Office Renovation)	B&G	$128,742	$87,064	$41,678	68%
Justice Center Sidewalk Repair - Employee Entrance	B&G	$28,000		$28,000	
Justice Center Roof Repairs	B&G	$6,000		$6,000	
Yard Fence Bldg. & Grounds Maintenance Shop	B&G	$12,000		$12,000	
Library Chiller	B&G	$95,000		$95,000	
SAGES - Computer Software & Upgrades	Building Safety	$224,006	$142,222	$81,784	63%

FY 2019
CIP Projects- Active

Project Name	Lead Department	Approved Budget To Date	Expenditures as of 03/21/2019 (From Finance)	Available Budget	Percent Spent
EOC- E911 Remote Location	911	$100,000	$17,800	$82,200	18%
Weather Warning Siren System Repairs	EMA	$15,520	$13,829	$1,691	89%
Future Floodplain Study Update	Env MGNT	$28,000		$28,000	
SCBA Breathing Apparatus	Fire	$968,500	$966,226	$2,275	100%
Fire Station 2	Fire	$2,500,000	$107,985	$2,392,015	4%
Septic System Repair - FS#1 - 75% Fire, 25% EMS	Fire	$138,800	$2,461	$136,340	2%
Links Training Facility Concept Design & Site Development	Fire	$25,000		$25,000	
Station Exhaust System(s) Air Evac	Fire	$41,000		$41,000	
Extrication Equipment	Fire	$133,300		$133,300	
Roof for Fire Stations (1,6,10)	Fire	$130,000		$130,000	
Fire Hose - Replacement of 4" to 5"	Fire	$19,000	$11,273	$7,727	59%
Security & Access at Fire Stations (Swipe cards & cameras)	Fire	$25,400		$25,400	
Paving (Small area at Training)	Fire	$14,000	$11,161	$2,839	80%
Fire Boots	Fire	$25,000		$25,000	
Munis Upgrades	Finance	$56,444	$53,661	$2,782	95%
Fuel Management System Replacement & Cameras	Fleet	$36,500	$5,642	$30,858	15%

FY 2019
CIP Projects- Active

Project Name	Lead Department	Approved Budget To Date	Expenditures as of 03/21/2019 (From Finance)	Available Budget	Percent Spent
Phone System Revitalization & Conversion	IS	$486,000	$130,928	$355,072	27%
CAD/Spillman Upgrade	IS	$117,000	$25,791	$91,209	22%
FY19 Systemwide Consolidate/Redesign	IS	$175,000	$107,445	$67,555	61%
Aerial Imagery Data Collection	IS	$68,728	$3,300	$65,428	5%
Data Center Fire Suppression (Jail & Stonewall Data Centers)	IS	$57,000		$57,000	
AV Upgrades (Conference Room & Training Room)	IS	$46,200	$34,298	$11,902	74%
Library Restroom Renovation	Library	$153,000		$153,000	
Furniture for Repurposed Reference Room	Library	$20,141	$6,051	$14,090	30%
Path Study - Budget includes Grant $.	Engineering	$180,000	$155,753	$24,247	87%
Comprehensive Transportation Plan	Public Works	$312,500	$264,339	$48,161	85%
Antioch, Harp, Seay and SR 92 (GDOT PI 09971/09972)	**GDOT**				
Swanson Road	Roads	$335,000	$277,636	$57,364	83%
PW Parking Lot and Fence Expansion	Roads	$92,686	$8,690	$83,996	9%
County Wide Non 2017 SPLOST Pipe Replacements	Roads	$500,000		$500,000	
South Fayette Salt Barn	Roads	$18,278		$18,278	
Shed Replacement/Upgrades	Roads	$40,000	$8,823	$31,177	22%

FY 2019
CIP Projects- Active

Project Name	Lead Department	Approved Budget To Date	Expenditures as of 03/21/2019 (From Finance)	Available Budget	Percent Spent
Kenwood Park Improvements	Recreation	$443,315	$350,336	$92,979	79%
All Parks Entrance Sign Replacement	Recreation	$86,500	$4,215	$82,285	5%
Brooks Park - Parking Lot Addition	Recreation	$45,000	$14,880	$30,120	33%
McCurry Park - Splash Pad and Other Amenities	Recreation	$150,000		$150,000	
Recrowning Soccer Field #6	Recreation	$75,000	$46,216	$28,784	62%
McCurry Park Soccer Field Lighting Refurbishment	Recreation	$565,000	$564,908	$92	100%
Kiwanis /McCurry Parks Dugout Refurbish	Recreation	$26,000	$17,637	$8,363	68%
Kiwanis Park Fencing Refurbishment	Recreation	$49,000	$27,657	$21,343	56%
Kiwanis Park Field #4 Refurbishment	Recreation	$49,000		$49,000	
All Parks Restroom Stalls	Recreation	$265,000	$117,018	$147,982	44%
Painting Park Building and Structures	Recreation	$60,000	$26,061	$33,939	43%
Brooks Field House Deck/Ramp	Recreation	$5,000		$5,000	
Park Playground Upgrades	Recreation	$20,000	$9,912	$10,088	50%
Park Security Cameras	Recreation	$80,000	$67,469	$12,531	84%
McCurry Park Dog Park	Recreation	$25,000		$25,000	
McCurry Park Football Field Fencing #3	Recreation	$40,000		$40,000	
McCurry Park Parking Lot Striping	Recreation	$20,000	$8,322	$11,678	42%
McCurry Park Drainage Improvements	Recreation	$29,000	$19,798	$9,202	68%
Brooks Equestrian Park	Recreation	$25,000	$1,015	$23,985	4%
Multi-Purpose Trails	Recreation	$100,000		$100,000	
Kiwanis Park Athletic Field Lighting Refurbishment	Recreation	$110,000	$56,796	$53,204	52%
Consultant for Needs Assessment and Strategic Plan	Recreation	$45,000		$45,000	
Park Security Cameras (20)	Recreation	$45,000		$45,000	

FY 2019
CIP Projects- Active

Project Name	Lead Department	Approved Budget To Date	Expenditures as of 03/21/2019 (From Finance)	Available Budget	Percent Spent
The Links Public Safety Training Center	Sheriff	$1,925,000	$1,308,870	$616,130	68%
Sheriff's Office Refurbishments - FY19 Phase	Sheriff	$102,752		$102,752	
Sheriff Body Camera Program	Sheriff	$116,455	$72,391	$44,064	62%
Watchguard HD Panoramic In-Car Video Camera Replacements (4)	Sheriff - Field Ops	$20,600	$20,483	$117	99%
Data Extraction and Storage	Sheriff - Jail	$14,160		$14,160	
IAS World - Field Mobile Software	Tax Assessor	$87,590		$87,590	
Pedestrian Bridge over SR 54 at Hospital	Public Works				

FY 2019
CIP Projects- Active

Project Name	Lead Department	Approved Budget To Date	Expenditures as of 03/21/2019 (From Finance)	Available Budget	Percent Spent
SCADA Upgrade	Water - 117616	$498,983	$113,413	$385,570	23%
Filter Modifications - South Fayette	Water - 117612	$46,095	$59,965	($13,870)	130%
Sodium Hypochlorite Crosstown	Water - 117612	$257,300		$257,300	
Sodium Hypochlorite S. Fayette	Water - 117612	$257,300		$257,300	
GDOT 54 Widening	Water - 117610	$1,300,000	$1,223,205	$76,795	94%
Bridger Point Waterline Ext	Water - 117607	$118,253	$114,161	$4,091	97%
Purate Chlorine Dioxide	Water - 117616	$450,000	$198,393	$251,607	44%
North Waterline Enhancement Project	Water - 117616	$600,000		$600,000	
Backwash Return Elimination CTP (Pumping System)	Water - 117616	$550,000		$550,000	
Backwash Return Elimination SF (Float Decant System)	Water - 117616	$350,000		$350,000	
Solids Handling (Dewatering) - Crosstown	Water - 117616	$500,000	$25,456	$474,544	5%
Camera Surveillance Systems S Fay	Water - 117616	$10,000	$788	$9,212	8%
Camera Surveillance Systems CTWP	Water - 117616	$10,000	$911	$9,089	9%
Portable Flow Meter	Water - 117616	$16,000	$15,694	$307	98%
Chemical Feed Equipment	Water - 117616	$30,000		$30,000	
Waterline Extensions	Water - 117607	$450,000	$380,493	$69,507	85%
Crosstown Renovation	Water - 117616	$150,000		$150,000	
SEMS Asset Management System	Water - 117616	$36,604	$25,304	$11,300	
Water Selector - McIntosh	Water - 117616	$500,000	$273,994	$226,006	55%
Water Selector - Horton	Water - 117616	$450,000	$43,190	$406,810	10%
Water Plan Maintenance & Storage Building Improvements	Water - 117616	$100,000		$100,000	

FY2018
CIP Projects – Completed/Closed

Department	Project/Asset Description	Cost	Dept Total	Fund Total
Animal Control	Donations - Cat Cages Etc.	18,044.00	$ 18,044.00	
B & G	Stonewall Parking Lot Reseal/Re-Stripe	107,164.40		
B & G	LED Lighting Project - Library	34,532.84		
B & G	Cameras (B&G - Countywide System)	4,998.36		
B & G	Justice Center Water Heater Replacement	9,500.00		
B & G	Improvements @ Stonewall	73,739.85		
B & G	Stonewall Renovations - IT	7,615.98	$ 237,551.43	
EMA	Countywide - AED	56,580.00	$ 56,580.00	
Recreation	Kenwood Park Fence Replacement	17,615.00		
Recreation	Kenwood Park Restroom Flooring	20,430.00		
Recreation	Lake McIntosh Rowing	28,953.24		
Recreation	Kenwood Park Track Refurbishment	113,067.00		
Recreation	McCurry Park Turf Planning Soccer & Football	100,601.98	$ 280,667.22	
Roads	Clark Forklift	3,528.63		
Roads	Salt Barn (1)	15,769.12		
Roads	Snow Plow (1)	12,382.00		
Roads	Equipment Building	14,053.60	$ 45,733.35	
Sheriff	Sheriff's Office Refurbishment - Part 1	102,163.45	$ 102,163.45	
Sheriff - Jail	Jail Intercom Communications System	8,885.00	$ 8,885.00	$ 749,624.45
911	HVAC System (911)	47,732.00	$ 47,732.00	$ 47,732.00
EMS	AEDs	6,900.00		
EMS	EMS Protective Clothing	7,097.48	$ 13,997.48	$ 13,997.48
Water CIP	Castle Lake	692,538.18		
Water CIP	White Road Control Valve	27,430.44		
Water CIP	Coastline Road Waterline Extension	331,149.63	$ 1,051,118.25	$ 1,051,118.25
		$ 1,862,472.18	**$ 1,862,472.18**	**$ 1,862,472.18**

FY 2019
CIP Projects – Completed/Closed

Department	Project/Asset Description	Cost	Dept Total	Fund Total
Animal Control	Animal Control Pavilion	6,000.00		
Animal Control	Replacement of Cat Cages	29,487.43		
Animal Control	Animal Control Sewer Line	82,131.84	$ 117,619.27	
B & G	Walk-In Body Cooler & Storage Bldg	13,735.55	$ 13,735.55	
EMA	EOC - Highband Antenna	2,156.00	$ 2,156.00	
Env MGNT	Environmental Management Office Remodel	15,500.00		
Env MGNT	HD Pole Camera	15,450.00	$ 30,950.00	
IS	FY18 Systemwide Consolidate/Redesign	174,737.40	$ 174,737.40	
Library	Library Roof Replacement	100,886.44	$ 100,886.44	
Recreation	Heritage Park Irrigation System	10,868.00	$ 10,868.00	
Roads	Mobile Classroom Trailers	34,437.62	$ 34,437.62	
Sheriff	Taser Replacement Program	64,800.00		
Sheriff	HVAC Equipment Replacement Program	89,872.00	$ 154,672.00	
Sheriff - Jail	Jail Camera System Upgrade	50,762.08	$ 50,762.08	
State Court Judge	State Court Office Renovations	15,690.00	$ 15,690.00	$ 706,514.36
Fire	Firefighter Protective Clothing	63,983.21	$ 63,983.21	$ 63,983.21
		$ 770,497.57	**$ 770,497.57**	**$ 770,497.57**

FY 2019
2017 SPLOST- Active

	Project Name	Category	SPLOST BOOK BUDGET	Grant Budget	Prior BOC Approval	BOC Adj - since Jul 2017	BOC/Munis Budget	Expenditures as of 03/22/2019 (From Finance)	Available Budget	Percent Spent to revised budget
2017 Stormwater - Category I										
1	**Emerald Lake Dam**	Cat I	$2,064,000		1,001,778.00		$3,065,778	$2,995,984	$69,794	**98%**
2	**Kozisek Dam**	Cat I	$250,000		(200,000.00)		$50,000	$4,100	$45,900	**8%**
3	**Longview Dam**	Cat I	$704,907		(469,351.00)		$235,556	$94,553	$141,003	**40%**
4	**330 Oak Street**	Cat I	$78,506			$50,000	$128,506	$17,698	$110,808	**14%**
5	**Rising Star Road**	Cat I	$449,142		(1,872.00)	$67,000	$514,270	$601,136	($86,866)	**117%**
6	**Antebellum Lane**	Cat I	$481,581	$522,882			$1,004,463	$569,404	$435,059	**57%**
7	**Old Senoia Road**	Cat I	$668,572		(714.00)	$233,000	$900,858	$90,416	$810,442	**10%**
8	**Broom Blvd.**	Cat I	$387,880				$387,880	$295,068	$92,812	**76%**
9	**287 Graves Road**	Cat I	$293,538			$67,049	$360,587	$63,137	$297,450	**18%**
10	**Heritage Park Way**	Cat I	$98,397				$98,397	$0	$98,397	**0%**
	2017 Stormwater - Category I Totals		**$5,476,523**	**$522,882**	**329,841.00**	**$417,049**	**$6,746,295**	**$4,731,496**	**$2,014,799**	

FY 2019
2017 SPLOST- Active

	Project Name	Category	SPLOST BOOK BUDGET	Grant Budget	Prior BOC Approval	BOC Adj - since Jul 2017	BOC/Munis Budget	Expenditures as of 03/22/2019 (From Finance)	Available Budget	Percent Spent to revised budget
2017 Stormwater - Category II, Tier I										
11	**514 Avalon Dr**	Cat II, Tier I	$169,118				$169,118	$0	$169,118	0%
12	**215 Brandon Mill Circle - South**	Cat II, Tier I	$437,648				$437,648	$0	$437,648	0%
13	**266 Callaway Rd**	Cat II, Tier I	$533,218				$533,218	$23,052	$510,166	4%
14	**364 Chappell Rd**	Cat II, Tier I	$336,399				$336,399	$44,632	$291,767	13%
15	**120 Deer Forest Trail**	Cat II, Tier I	$145,508				$145,508	$0	$145,508	0%
16	**315 Dogwood Trl**	Cat II, Tier I	$595,879				$595,879	$62,090	$533,789	10%
17	**120 Mercedes Trl**	Cat II, Tier I	$224,070				$224,070	$52,634	$171,436	23%
18	**130 Morning Dove Dr**	Cat II, Tier I	$244,389				$244,389	$54,254	$190,135	22%
19	**151 Patricia Ln**	Cat II, Tier I	$295,527				$295,527	$46,199	$249,328	16%
20	**199 Roberts Road**	Cat II, Tier I	$193,861				$193,861	$0	$193,861	0%
21	**160 Scott Boulevard**	Cat II, Tier I	$99,114				$99,114	$0	$99,114	0%
22	**175 Silver Leaf Dr**	Cat II, Tier I	$247,827				$247,827	$49,607	$198,220	20%
23	**503 Westbridge Drive**	Cat II, Tier I	$89,733				$89,733	$0	$89,733	0%
24	**517 Westbridge Drive**	Cat II, Tier I	$93,082				$93,082	$0	$93,082	0%
	2017 Stormwater - Category II, Tier I Totals		**$3,705,373**	**$0**	**-**	**$0**	**$3,705,373**	**$332,468**	**$3,372,905**	

FY 2019
2017 SPLOST- Active

	Project Name	Category	SPLOST BOOK BUDGET	Grant Budget	Prior BOC Approval	BOC Adj - since Jul 2017	BOC/Munis Budget	Expenditures as of 03/22/2019 (From Finance)	Available Budget	Percent Spent to revised budget
2017 Stormwater - Category II, Tier II										
25	**Category II Projects**	Cat II, Tier II	$10,440,149			($3,393,685)	$7,046,464	$0	$7,046,464	0%
26	**115 Brockton Ct**	Cat II, Tier II				$105,739	$105,739	$35,837	$69,902	34%
27	**165 Grandchester**	Cat II, Tier II				$159,475	$159,475	$20,521	$138,954	13%
28	**547 Kenwood Road**	Cat II, Tier II				$229,611	$229,611	$50,568	$179,043	22%
29	**223 Cedar Trail**	Cat II, Tier II				$58,206	$58,206	$5	$58,201	0%
30	**130 Darren Drive**	Cat II, Tier II				$383,630	$383,630	$3	$383,627	0%
31	**110 Mark Lane**	Cat II, Tier II				$249,037	$249,037	$4	$249,033	0%
32	**130 Matthew Way**	Cat II, Tier II				$322,809	$322,809	$3	$322,806	0%
33	**170 Ridge Way**	Cat II, Tier II				$228,742	$228,742	$3	$228,739	0%
34	**120 Shoal Creek Way**	Cat II, Tier II				$380,630	$380,630	$4	$380,626	0%
35	**118 Davis Road**	Cat II, Tier II				$454,822	$454,822	$0	$454,822	0%
36	**145 Millers Oak Way**	Cat II, Tier II				$202,401	$202,401	$0	$202,401	0%
37	**116 Downing Court**	Cat II, Tier II				$84,127	$84,127	$0	$84,127	0%
38	**110 Branchwood Court**	Cat II, Tier II				$58,323	$58,323	$0	$58,323	0%
39	**170 Angela Drive**	Cat II, Tier II				$59,084	$59,084	$2	$59,082	0%
	2017 Stormwater - Category II, Tier II Totals		**$10,440,149**	**$0**	**-**	**($417,049)**	**$10,023,100**	**$106,950**	**$9,916,150**	

FY 2019
2017 SPLOST- Active

	Project Name	Category	SPLOST BOOK BUDGET	Grant Budget	Prior BOC Approval	BOC Adj - since Jul 2017	BOC/Munis Budget	Expenditures as of 03/22/2019 (From Finance)	Available Budget	Percent Spent to revised budget
2017 Stormwater - Category III										
40	**Category III Projects**	Cat III	$1,651,211			($152,773)	$1,498,438	$0	$1,498,438	0%
41	**380 Sherwood Road**	Cat III				$7,853	$7,853	$0	$7,853	0%
42	**Sherwood Road @ Brookshire Drive**	Cat III				$18,906	$18,906	$0	$18,906	0%
43	**325 Sherwood Road**	Cat III				$7,696	$7,696	$0	$7,696	0%
44	**310 Sherwood Road**	Cat III				$7,908	$7,908	$0	$7,908	0%
45	**205 Brookshire Drive**	Cat III				$9,147	$9,147	$0	$9,147	0%
46	**185 Brookshire Drive**	Cat III				$9,147	$9,147	$0	$9,147	0%
47	**115 Horseshoe Circle**	Cat III				$9,059	$9,059	$0	$9,059	0%
48	**114 Kite Lake Road**	Cat III				$8,332	$8,332	$7,622	$710	91%
49	**257 Kite Lake Road**	Cat III				$8,808	$8,808	$6,775	$2,033	77%
50	**285 Kite Lake Road**	Cat III				$8,730	$8,730	$5,539	$3,191	63%
51	**125 Bankstown Road**	Cat III				$7,575	$7,575	$0	$7,575	0%
52	**125 Emerald Lane**	Cat III				$19,553	$19,553	$1,400	$18,153	7%
	2017 Stormwater - Category III Totals		**$1,651,211**	**$0**	**-**	**($30,059)**	**$1,621,152**	**$21,336**	**$1,599,816**	

FY 2019
2017 SPLOST- Active

	Project Name	Category	SPLOST BOOK BUDGET	Grant Budget	Prior BOC Approval	BOC Adj - since Jul 2017	BOC/Munis Budget	Expenditures as of 03/22/2019 (From Finance)	Available Budget	Percent Spent to revised budget
2017 Stormwater - Category IV										
53	**Category IV Projects**	Cat IV	$1,493,251				$1,493,251	$0	$1,493,251	0%
	2017 Stormwater - Category IV Totals		**$1,493,251**	**$0**	**-**	**$0**	**$1,493,251**	**$0**	**$1,493,251**	

FY 2019
2017 SPLOST- Active

	Project Name	Category	SPLOST BOOK BUDGET	Grant Budget	Prior BOC Approval	BOC Adj - since Jul 2017	BOC/Munis Budget	Expenditures as of 03/22/2019 (From Finance)	Available Budget	Percent Spent to revised budget
2017 Transportation - Infrastructure Preservation & Improvements										
54	Ebenezer Church Road Bridge Replacement	A.1	$659,500				$659,500	$0	$659,500	0%
55	Kenwood Road School Project	A.2	$600,000				$600,000	$11,339	$588,661	2%
56	Paved Roads, Gravel Roads & Bridges	A.3	$2,209,273			($1,410,270)	$799,003	$5,065	$793,938	1%
57	Dix-Lee-On Drive	A.3				$89,795	$89,795	$88,751	$1,044	99%
58	Antioch Road	A.3				$675,640	$675,640	$0	$675,640	0%
59	Buckeye Road	A.3				$67,050	$67,050	$11,864	$55,186	18%
60	County Wide Bridge Maintenance	A.3				$230,000	$230,000	$0	$230,000	0%
61	Camp Creek Bridge Evaluation	A.3				$20,000	$20,000	$16,280	$3,720	81%
61	Resurfacing Program FY2019	A.3				$75,235	$75,235	$8,293	$66,942	11%
62	Resurfacing Program FY2020	A.3				$67,890	$67,890	$0	$67,890	0%
63	Palmetto Rd Resurface, Stripe and Shoulder	A.3				$184,660	$184,660	$142,533	$42,127	77%
	2017 Transportation - Infrastructure Totals		**$3,468,773**	**$0**	**-**	**$0**	**$3,468,773**	**$284,125**	**$3,184,648**	

FY 2019
2017 SPLOST- Active

	Project Name	Category	SPLOST BOOK BUDGET	Grant Budget	Prior BOC Approval	BOC Adj - since Jul 2017	BOC/Munis Budget	Expenditures as of 03/22/2019 (From Finance)	Available Budget	Percent Spent to revised budget
2017 Transportation - Federal Aid Corridor Improvements										
64	Realignment of SR 279 & Corinth Road	B.1	$4,564,500	$101,400			$4,665,900	$17,198	$4,648,702	0%
65	Sandy Creek Road Operational Improvements	B.2	$3,107,800	$139,364			$3,247,164	$36,821	$3,210,343	1%
66	State Route 74	B.3	$720,000				$720,000	$2,657	$717,343	0%
	2017 Transportation - Federal Aid Corridor Totals		**$8,392,300**	**$240,764**	**-**	**$0**	**$8,633,064**	**$56,676**	**$8,576,388**	
2017 Transportation - Intersection Improvements										
67	Redwine, Bernhard, Pt. Pkwy	C.1	$1,200,000				$1,200,000	$101,480	$1,098,520	8%
68	Brogdon & New Hope Road	C.2	$1,200,000				$1,200,000	$85,956	$1,114,044	7%
69	Ebenezer Church, Ebenezer & Spear	C.3	$1,500,000				$1,500,000	$17,286	$1,482,714	1%
70	Antioch & Goza Roads	C.4	$1,070,000				$1,070,000	$134,657	$935,343	13%
71	Intersection Safety Improvements	C.5	$500,000				$500,000	$0	$500,000	0%
	2017 Transportation - Intersection Totals		**$5,470,000**	**$0**	**-**	**$0**	**$5,470,000**	**$339,379**	**$5,130,621**	

FY 2019
2017 SPLOST- Active

	Project Name	Category	SPLOST BOOK BUDGET	Grant Budget	Prior BOC Approval	BOC Adj - since Jul 2017	BOC/Munis Budget	Expenditures as of 03/22/2019 (From Finance)	Available Budget	Percent Spent to revised budget
2017 Transportation - Pedestrian, Bicycle and Multi-Use Path Projects										
72	Redwine Road Multi-Use Path	D.1	$556,680	$1,321,402			$1,878,082	$214,060	$1,664,022	11%
73	Starr's Mill School Tunnel	D.2	$900,000				$900,000	$72,640	$827,360	8%
74	Bike Lanes & Multi-Use Paths	D.3	$250,000				$250,000	$3,690	$246,310	1%
	2017 Transportation - Path Projects Totals		**$1,706,680**	**$1,321,402**	**-**	**$0**	**$3,028,082**	**$290,390**	**$2,737,692**	
2017 Transportation - Detailed Planning Studies - FY2018 Functional Budget $166,300										
75	Banks Road Planning Study	E.1	$47,000	$124,539			$171,539	$27,474	$144,065	16%
76	Tyrone & Palmetto Road Planning	E.2	$84,600	$159,697			$244,297	$29,898	$214,399	12%
77	Lee's Mill, New Hope, Kenwood Planning	E.3	$76,600				$76,600	$0	$76,600	0%
78	Inman Road Planning Study	E.4	$59,000				$59,000	$0	$59,000	0%
79	SR 279 Planning Study	E.5	$65,400	$101,400			$166,800	$13,968	$152,832	8%
80	Transportation Studies	E.6	$150,000				$150,000	$0	$150,000	0%
	2017 Transportation - Planning Studies Totals		**$482,600**	**$385,636**	**-**	**$0**	**$868,236**	**$71,340**	**$796,896**	

FY 2019
2017 SPLOST- Active

	Project Name	Category	SPLOST BOOK BUDGET	Grant Budget	Prior BOC Approval	BOC Adj - since Jul 2017	BOC/Munis Budget	Expenditures as of 03/22/2019 (From Finance)	Available Budget	Percent Spent to revised budget
2017 Public Safety Radio System										
81	Public Safety Radio System - ($150,000 Water Included)	n/a	$15,150,000				$15,150,000	$662,794	$14,487,206	4%
82	Bldg & Grounds Radio Replacements	n/a	$71,316				$71,316	$0	$71,316	0%
83	EMA Radio Replacements	n/a	$29,800				$29,800	$4,986	$24,814	17%
84	Roads Radio Replacements	n/a	$142,091				$142,091	$0	$142,091	0%
85	Sheriff Mobile Radio Replacements	n/a	$944,700				$944,700	$0	$944,700	0%
86	Sheriff Portable Radio Replacements	n/a	$1,058,829				$1,058,829	$0	$1,058,829	0%
87	Fire Radio Replacements	n/a	$562,300				$562,300	$15,586	$546,714	3%
88	EMS Radio Replacements	n/a	$252,500				$252,500	$6,714	$245,786	3%
	2017 Public Safety Radio System Totals		**$18,211,536**	**$0**	**-**	**$0**	**$18,211,536**	**$690,080**	**$17,521,456**	

FY 2019
2017 SPLOST- Active

	Project Name	Category	SPLOST BOOK BUDGET	Grant Budget	Prior BOC Approval	BOC Adj - since Jul 2017	BOC/Munis Budget	Expenditures as of 03/22/2019 (From Finance)	Available Budget	Percent Spent to revised budget
2017 Fire & Emergency Services										
89	**Fire Station Relocation – Station #4**	n/a	$2,405,160				$2,405,160	$983,338	$1,421,822	41%
90	**Replacement Fire Pumper**	n/a	$394,070				$394,070	$394,070	$0	100%
91	**Fire Training Center & Contingency**	n/a	$150,770				$150,770	$158,619	($7,849)	105%
	2017 Fire & Emergency Services Totals		**$2,950,000**	**$0**	**-**	**$0**	**$2,950,000**	**$1,536,027**	**$1,413,973**	

FY 2018/2019
2017 SPLOST– Completed/Closed

Department	Project Description	Cost
EMD	Rising Star Road	601,136.13
EMD	Emerald Lake Dam	2,995,983.92
EMD	Laura Lane	9,318.68
EMD	Busbin Road	9,971.52
EMD	Lee's Mill Road	496,226.56
EMD	Brittany Way	67,432.35
EMD	Lawson Lane	94,509.06
EMD	Canterbury Lane	101,961.32
EMD	Westbridge Road	69,829.53
EMD	McBride Road	42,059.27
EMD	Lowery Road	44,762.64
EMD	Bernhard Road	45,186.63
	Total	**$ 4,578,377.61**

FY 2018/2019
2017 SPLOST – Completed/Closed

Department	Project Description	Cost
Fire	At Links Training Facility ****Waterline Only - 2018****	158,618.60
Fire	Replace 1991 Pumper	394,070.00
	Total	**$ 552,688.60**

Planning for FY2020

2017 SPLOST

Implementation and Overview

BOARD OF COMMISSIONERS RETREAT

APRIL 5, 2019

2017 SPLOST - Stormwater

	# of Projects	2017 Approved SPLOST	Expended to Date
Projects In Design			
Category I	2	954,907	98,653
Category II	14	3,754,920	323,072
Category III	3	24,105	0
Projects In Construction			
Category I	5	1,910,077	1,035,723
Category II	2	840,268	116,344
Category III	2	27,128	1,400
Projects Completed			
Category I	10	3,488,276	4,559,087
Category III	10	78,134	77,425
Total		**$11,077,815**	**$6,211,704**

2017 SPLOST – Fire Station #4

- **On March 14, 2019, the County awarded the construction contract, in the amount of $2,572,057, for a three-bay facility**

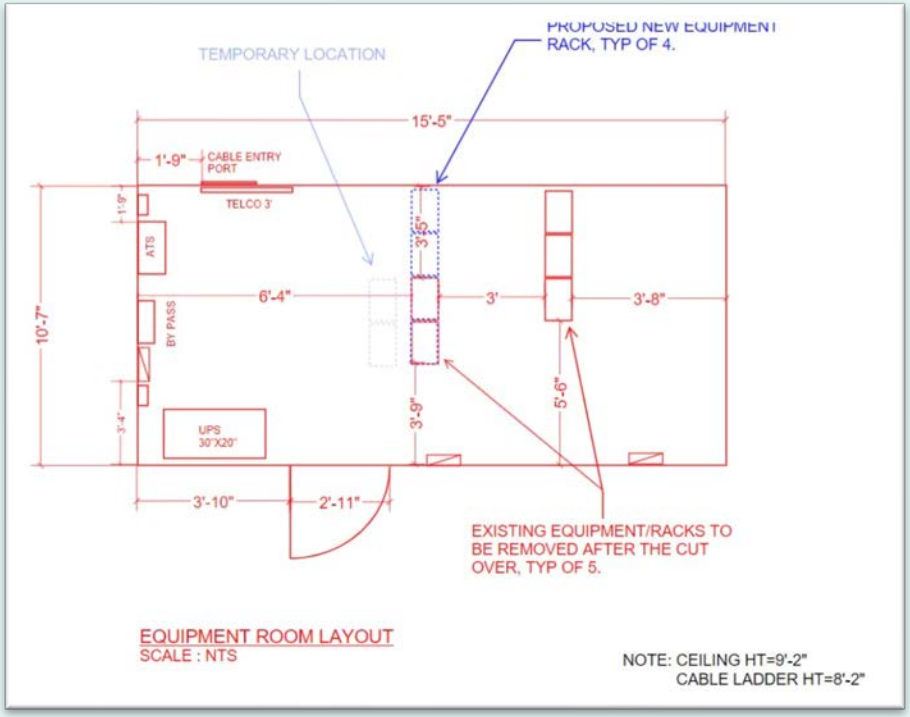
- **To date, $983,338 has been expended towards design and getting a pad ready site**

2017 SPLOST – 911 Radio System

911 Radio System – SPLOST Contract Detail	
System & Infrastructure	4,691,104
Subscriber Radios	2,776,181
Contingency & Enhancements	2,750,000
15 Year Maintenance & Support	4,747,390
Total Cost	**14,964,675**

2017 SPLOST – 911 Radio System

- Vendor site visits complete
- Initial radio order complete
- Agency radio templates – final approval pending
- Final recommendations from site visits pending
- Expenditures to date $681,231



2017 SPLOST

Implementation and Overview

QUESTIONS

911 Radio System - SPLOST Contractual Analysis

Attachment A

	RFP Propsoed	Realigned	Revised	Negotiated
System Total	**3,412,623.97**	**3,412,623.97**	**3,353,312.97**	**4,691,104.42**
System And Infrastructure Subtotal	7,815,538.59	7,795,538.59	7,795,538.59	7,795,538.59
Features Subtotal	343,126.88	363,126.88	343,126.88	1,657,365.88
Onetime Startup Subtotal	1,253,958.50	1,253,958.50	1,214,647.50	1,238,199.95
Discount Subtotal Credit	(6,000,000.00)	(6,000,000.00)	(6,000,000.00)	(6,000,000.00)

System and Infrastructure

Sites	5,417,940.87	5,417,940.87	5,417,940.87	5,417,940.87
Network Management	124,693.87	124,693.87	124,693.87	124,693.87
Towers, Building, and Construction Costs	1,087,082.10	1,087,082.10	1,087,082.10	1,087,082.10
Dispatch Consoles	238,202.56	238,202.56	238,202.56	238,202.56
Logging Recorder Interface	28,884.19	8,884.19	8,884.19	8,884.19
IP Microwave	918,735.00	918,735.00	918,735.00	918,735.00
System And Infrastructure Subtotal	**7,815,538.59**	**7,795,538.59**	**7,795,538.59**	**7,795,538.59**

Features

GPS Location	80,826.00	80,826.00	80,826.00	80,826.00
ISSI	32,000.00	32,000.00	32,000.00	32,000.00
PTT over Cellular (Push To Talk)	82,398.00	82,398.00	82,398.00	82,398.00
Fire Station Alerting	43,829.00	43,829.00	43,829.00	43,829.00
Recommended Spares & Test Equipt	231,127.88	231,127.88	231,127.88	231,127.88
Add "Value" Options	0.00	20,000.00	0.00	0.00
All Options Incentive	(977,471.00)	(977,471.00)	(977,471.00)	(858,171.00)
Back Up Control Stations for Consoles	115,617.00	115,617.00	115,617.00	115,617.00
Enable P25 Data	734,800.00	734,800.00	734,800.00	734,800.00
Post-RFP Site Enhancements				
Spares - Reference Generator & Firewall				14,250.00
Tornado Warning System Radio Upgrade				173,474.00
Interoperability (Motorola Units)				39,220.00
Enhanced Monitoring Tools				220,489.00
New AC Units at sites				200,523.00
Enable Data Repeaters to Phase II				421,983.00
Program Management Services				125,000.00
Features Subtotal	**343,126.88**	**363,126.88**	**343,126.88**	**1,657,365.88**

Onetime Startup Costs

EFJ One Installation	1,188,277.50	1,188,277.50	604,605.00	604,605.00
Siren PM Services				14,917.50
Radio One Installation			583,672.50	583,672.50
Training			23,870.00	8,634.95
Training - Microwave			0.00	23,870.00
Performance Bond	63,181.00	63,181.00	0.00	0.00
Shipping	2,500.00	2,500.00	2,500.00	2,500.00
Service Subtotal	**1,253,958.50**	**1,253,958.50**	**1,214,647.50**	**1,238,199.95**

Discounts

Infrastructure System Purchase Discount by 11/15	(3,000,000.00)	(3,000,000.00)	(3,000,000.00)	(3,000,000.00)
Contract all items proposed	(3,000,000.00)	(3,000,000.00)	(3,000,000.00)	(3,000,000.00)
Incentive Subtotal Credit	**(6,000,000.00)**	**(6,000,000.00)**	**(6,000,000.00)**	**(6,000,000.00)**

911 Radio System - SPLOST Contractual Analysis

Attachment B

Subscriber Radios	RFP Propsoed	Realigned	Revised	Negotiated
Portable Radio Type 1 - VP5000				182,988.00
Portable Radio Type 2 - VP6000 Public Safety	3,789,650.00	3,789,650.00	3,789,650.00	1,121,990.13
Single-band Mobile Radio - VM5000	4,377,643.20	4,377,643.20	4,377,643.20	235,724.28
Single-band Mobile Radio - VM6000 Public Safety				1,021,261.83
Subscriber volume as proposed	(1,604,433.00)	(1,604,433.00)	(1,604,433.42)	0.00
Armada Software	0.00	0.00	500.00	500.00
Subscriber Services	448,715.12	448,715.12	448,715.12	213,716.87
Subscribers Subtotal	**7,011,575.32**	**7,011,575.32**	**7,012,074.90**	**2,776,181.11**

911 Radio System - SPLOST Contractual Analysis

Attachment C

Contingency	RFP Propsoed	Realigned	Revised	Negotiated
911 Contingency/Enhancements	0.00	0.00	0.00	2,750,000.00
Features Subtotal	**0.00**	**0.00**	**0.00**	**2,750,000.00**

911 Radio System - M & O Budget Contractual Analysis

Attachment D

Reocurring Service	**RFP Propsoed**	**Realigned**	**Revised**	**Negotiated**
System Upgrade Agreement (SUA)	**15 years**	**15 years**	**15 years**	**15 years**
15 years System Upgrade Agreement	1,441,906.00	4,520,000.00	4,520,000.00	1,441,906.00
Warranty and Maintenance price	4,127,367.00			4,127,367.00
Discount for upfront purchase	(1,049,273.00)			(1,049,273.00)
Mirowave SUA ad Hardware Refresh				187,390.00
ESChat Server Maintainance Year 2-5	38,981.13	38,981.13	15,111.13	40,000.00
Reocurring 15 Year Contract	**4,558,981.13**	**4,558,981.13**	**4,535,111.13**	**4,747,390.00**
All Attachments	**14,983,180.42**	**14,983,180.42**	**14,900,499.00**	**14,964,675.53**

	Total 15 Year Cost of Ownership -Modified 9/4/2018	Name: EFJohnson Sheets 9-13 - Schedule D (Detail)														Attachment D
Item	**Service Description**	**Year 1 Includes Warranty**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**	**Year 11**	**Year 12**	**Year 13**	**Year 14**	**Year 15**	
1	P25 System Software Upgrade Agreement - Hardware and Software (Software Care and Hardware Refresh as defined in proposal)		$ 102,993.29	$ 102,993.29	$ 102,993.29	$ 102,993.29	$ 102,993.29	$ 102,993.29	$ 102,993.29	$ 102,993.29	$ 102,993.29	$ 102,993.29	$ 102,993.29	$ 102,993.29	$ 102,993.29	$ 102,993.29	$1,441,906.00
2	Remote Technical Support		$11,400	$11,400	$11,400	$11,400	$11,400	$11,400	$11,400	$11,400	$11,400	$11,400	$11,400	$11,400	$11,400	$11,400	$159,600.00
3	System Monitoring (Included in Field Technical Support)		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0.00
4	System Dispatch Service (Included in field Technical Support)		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0.00
5	Field Technical Support (Includes System Monitoring, Disaster Preparedness Services and System Dispatch Services--System Restoration)		$ 112,902.00	$ 112,902.00	$ 116,289.00	$ 119,778.00	$ 123,371.00	$ 127,073.00	$ 130,884.00	$ 134,811.00	$ 138,855.00	$ 143,022.00	$ 147,312.00	$ 151,731.00	$ 156,283.00	$ 160,972.00	$1,876,185.00
6	Equipment Annual Preventive Maintenance		$ 59,708.00	$ 59,708.00	$ 61,499.00	$ 63,345.00	$ 65,245.00	$ 67,202.00	$ 69,218.00	$ 71,294.00	$ 73,434.00	$ 75,637.00	$ 77,906.00	$ 80,242.00	$ 82,650.00	$ 85,130.00	$992,218.00
7	Equipment Parts Replacement (Hardware Care as described in proposal)		$ 63,034.00	$ 63,034.00	$ 63,034.00	$ 63,034.00	$ 64,295.00	$ 64,295.00	$ 64,295.00	$ 64,295.00	$ 64,295.00	$ 65,581.00	$ 65,581.00	$ 65,581.00	$ 65,581.00	$ 65,581.00	$901,516.00
8	Microwave Warranty (Support & Maintenance after first year)		$ 14,132.00	$ 14,132.00	$ 14,132.00	$ 14,132.00	$ 14,132.00	$ 14,132.00	$ 14,132.00	$ 14,132.00	$ 14,132.00	$ 14,132.00	$ 14,132.00	$ 14,132.00	$ 14,132.00	$ 14,132.00	$197,848.00
9	Microwave Refresh (NMS yr 7&12, Complete Refresh)		$ 13,385.00	$ 13,385.00	$ 13,385.00	$ 13,385.00	$ 13,385.00	$ 13,385.00	$ 13,385.00	$ 13,385.00	$ 13,385.00	$ 13,385.00	$ 13,385.00	$ 13,385.00	$ 13,385.00	$ 13,385.00	$187,390.00
10	Disaster Preparedness Services (Included in Field Technical Support)		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0.00
11	Disaster Recovery Services (ATLAS built-in redundancy negates the need for separate Disaster Recovery Services)		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0.00
12	Security Update Service: inlcudes antivirus, security patches (Included in P25 System Software Upgrade Agreement).		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0.00
13	Logging Recorder Maintenance (Separate Contract between County and Quality Recording Solutions as indicated by OEM dealer)		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0.00
14	Extended Services PTToC		$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00											$40,000.00
																	$0.00
15	Subtotal		$ 387,554.29	$ 387,554.29	$ 392,732.29	$ 398,067.29	$ 394,821.29	$ 400,480.29	$ 406,307.29	$ 412,310.29	$ 418,494.29	$ 426,150.29	$ 432,709.29	$ 439,464.29	$ 446,424.29	$ 453,593.29	$5,796,663.00
16	One-time Discount Contingent on Purchase of all Services for a Given Year		-$44,210.00	-$44,210.00	-$49,388.00	-$54,723.00	-$48,003.00	-$53,662.00	-$59,489.00	-$65,492.00	-$71,676.00	-$98,166.00	-$104,725.00	-$111,480.00	-$118,440.00	-$125,609.00	-$1,049,273.00
17	**Total** (Word Document Page 12 subtotal plus page 13 subtotal)		**$ 343,344.29**	**$ 343,344.29**	**$ 343,344.29**	**$ 343,344.29**	**$ 346,818.29**	**$ 346,818.29**	**$ 346,818.29**	**$ 346,818.29**	**$ 346,818.29**	**$ 327,984.29**	**$ 327,984.29**	**$ 327,984.29**	**$ 327,984.29**	**$ 327,984.29**	**$4,747,390.00**

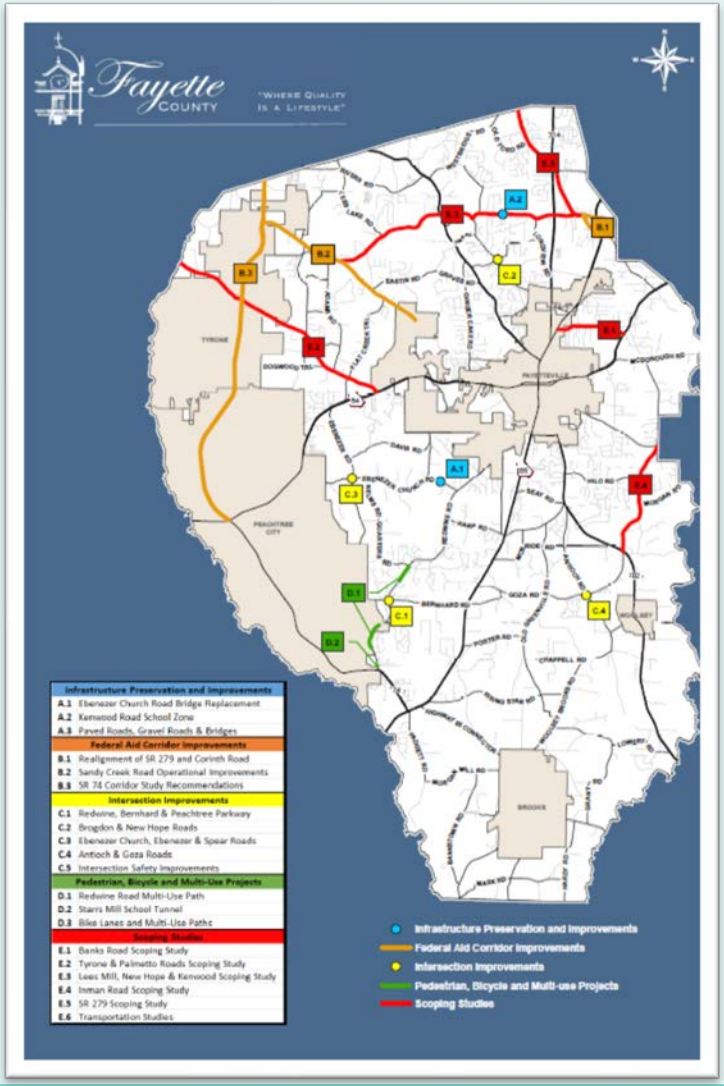
2017 SPLOST

Transportation Overview

BOARD OF COMMISSIONERS RETREAT

APRIL 5, 2019

2017 SPLOST Transportation Map



Infrastructure Preservation and Improvements

	Infrastructure Preservation and Improvements	Federal/State	SPLOST	Total	% Spent	Status
A.1	Ebenezer Church Road Bridge Replacement	$3,062,983	$356,500	$3,419,483	na	GDOT Project. In design.
A.2	Kenwood Road School Zone	$0	$600,000	$600,000	1.9%	Concept ready for BOC consideration
A.3	Paved Roads, Gravel Roads & Bridges	$0	$2,209,273	$2,209,273	12.3%	Resurfacing of 5.5 miles scheduled for 2019
	Subtotal A	**$4,447,682**	**$3,442,713**	**$6,228,756**		

Ebenezer Church Road Bridge Replacement

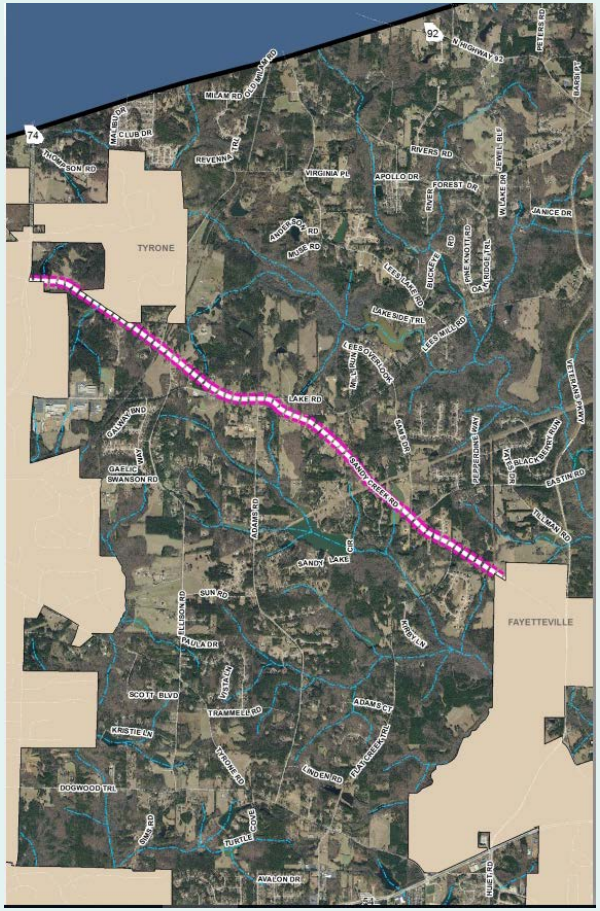
Kenwood Road School Zone

Federal Aid Corridor Improvements

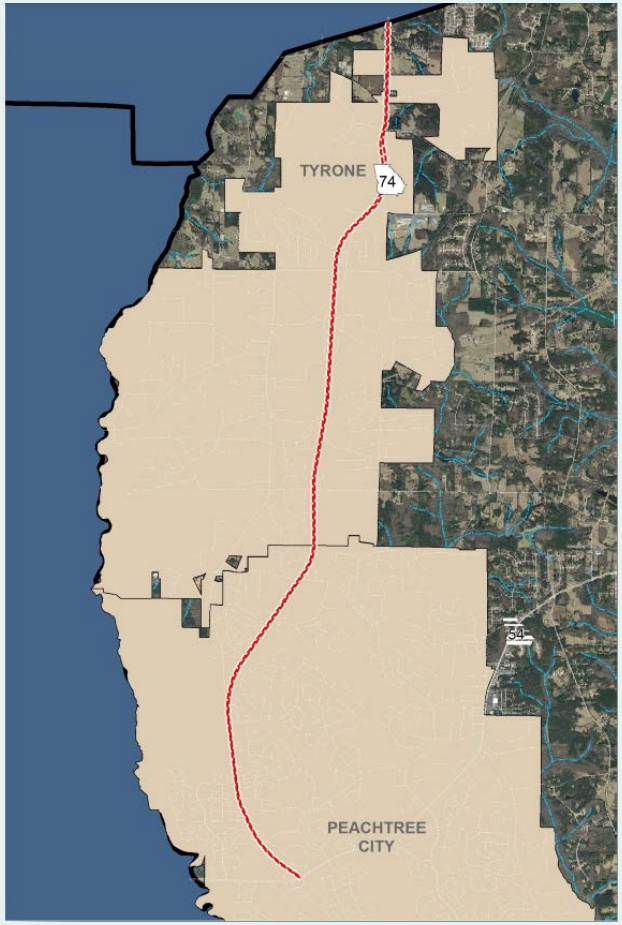
Possible Federal Aid Corridor Improvements		Federal/State	SPLOST	Total	% Spent	Status
B.1	Realignment of SR 279 and Corinth Road					
	◦ Detailed Planning Study	$101,400	$64,500	$165,900	10.4%	Study underway. Completion in CY 2019
	◦ Design & Construction	$0	$4,500,000	$4,500,000	na	Design in FY 2020 or 2021
B.2	Sandy Creek Road Operational Improvements					
	◦ Detailed Planning Study	$139,364	$71,800	$211,164	17.4%	Study underway. Completion in CY 2019
	◦ Design & Construction	$0	$3,036,000	$3,036,000	na	Design in FY 2020 or 2021
B.3	SR 74 Corridor Study Recommendations	$0	$720,000	$720,000	na	Design start in FY 2020
	Subtotal B	**$240,764**	**$8,392,300**	**$8,633,064**		

SR 279 and Corinth Road

Sandy Creek Road



SR 74



Intersection Improvements

Intersection Improvements		Federal/State	SPLOST	Total	% Spent	Status
C.1	Redwine, Bernhard & Peachtree Parkway	$0	$1,200,000	$1,200,000	8.5%	Roundabout design 50% complete
C.2	Brogdon & New Hope Roads	$0	$1,200,000	$1,200,000	7.2%	Roundabout design 90% complete
C.3	Ebenezer Church, Ebenezer & Spear Roads	$0	$1,500,000	$1,500,000	1.2%	Re-evaluation needed
C.4	Antioch & Goza Roads	$0	$1,070,000	$1,070,000	12.6%	Re-evaluation in May 2019
C.5	Intersection Safety Improvements	$0	$500,000	$500,000	na	na
	Subtotal C	**$0**	**$5,470,000**	**$5,470,000**		

Redwine, Bernhard, and Peachtree Parkway

Brogden and New Hope

Ebenezer Church, Ebenezer, and Spear Roads

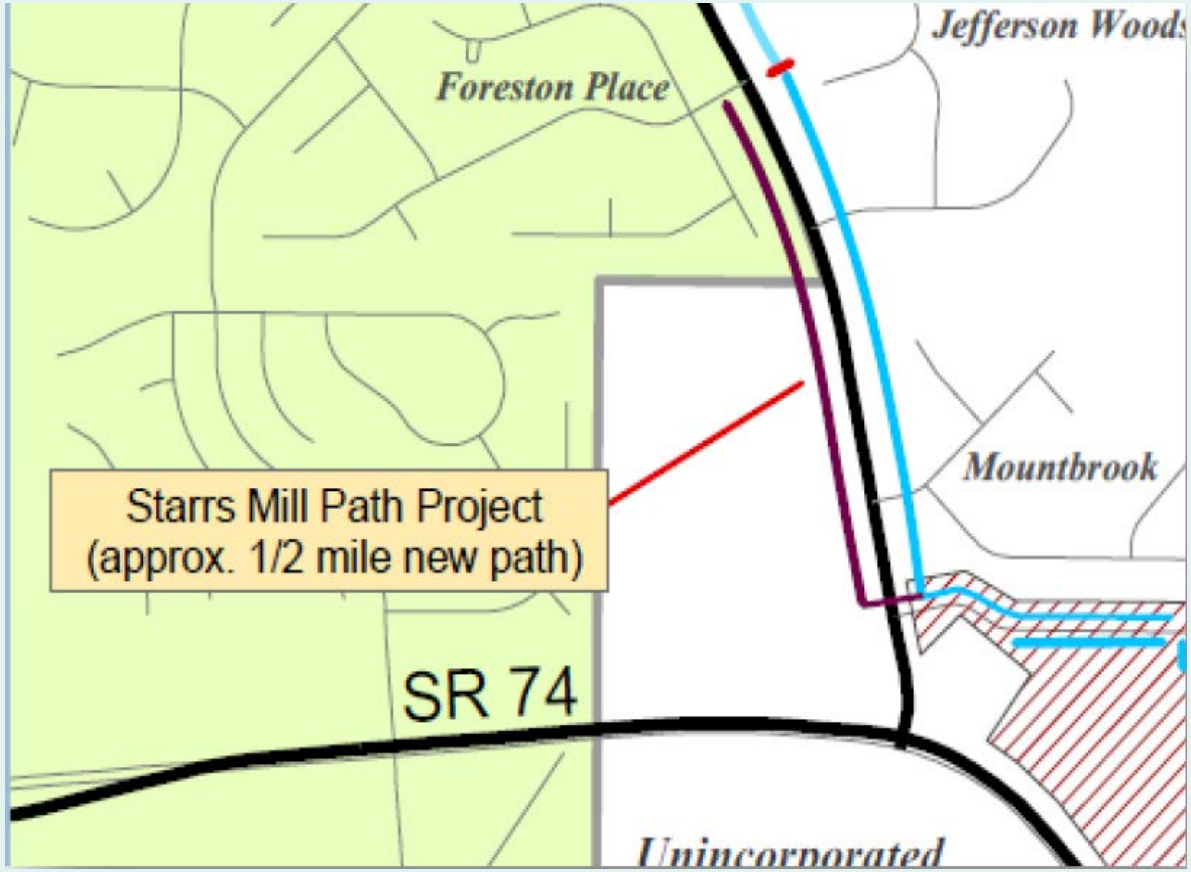
Antioch and Goza

Pedestrian, Bike, and Multi-Use Paths

Pedestrian, Bicycle and Multi-Use Path Projects		Federal/State	SPLOST	Total	% Spent	Status
D.1	Redwine Road Multi-Use Path	$1,321,402	$556,680	$1,878,082	11.4%	Design 80% complete. Oct letting.
D.2	Starr's Mill School Tunnel	$0	$900,000	$900,000	8.1%	Concept ready for BOC consideration
D.3	Bike Lanes and Multi-Use Paths	$0	$250,000	$250,000	1.5%	No action at this time
	Subtotal D	**$1,321,402**	**$1,706,680**	**$3,028,082**		

Redwine Road Multi-Use Path

Starr's Mill School Tunnel



Planning Studies

Detailed Planning Studies		Federal/State	SPLOST	Total	% Spent	Status
E.1	Banks Road Detailed Planning Study	$124,539	$47,000	$171,539	16.0%	Study underway. Completion in CY 2019
E.2	Tyrone & Palmetto Roads DPS	$159,697	$84,600	$244,297	12.2%	Study underway. Completion in CY 2019
E.3	Lees Mill, New Hope & Kenwood DPS	$0	$76,600	$76,600	na	No action at this time
E.4	Inman Road Detailed Planning Study	$0	$59,000	$59,000	na	No action at this time
E.5	SR 279 Detailed Planning Study	$101,400	$65,400	$166,800	8.4%	Study underway. Completion in CY 2019
E.6	Transportation Studies	$0	$150,000	$150,000	na	No action at this time
	Subtotal E	**$385,636**	**$482,600**	**$868,236**		

Banks Road

Tyrone and Palmetto Roads

Lee’s Mill, New Hope, and Kenwood

Inman Road

2017 SPLOST

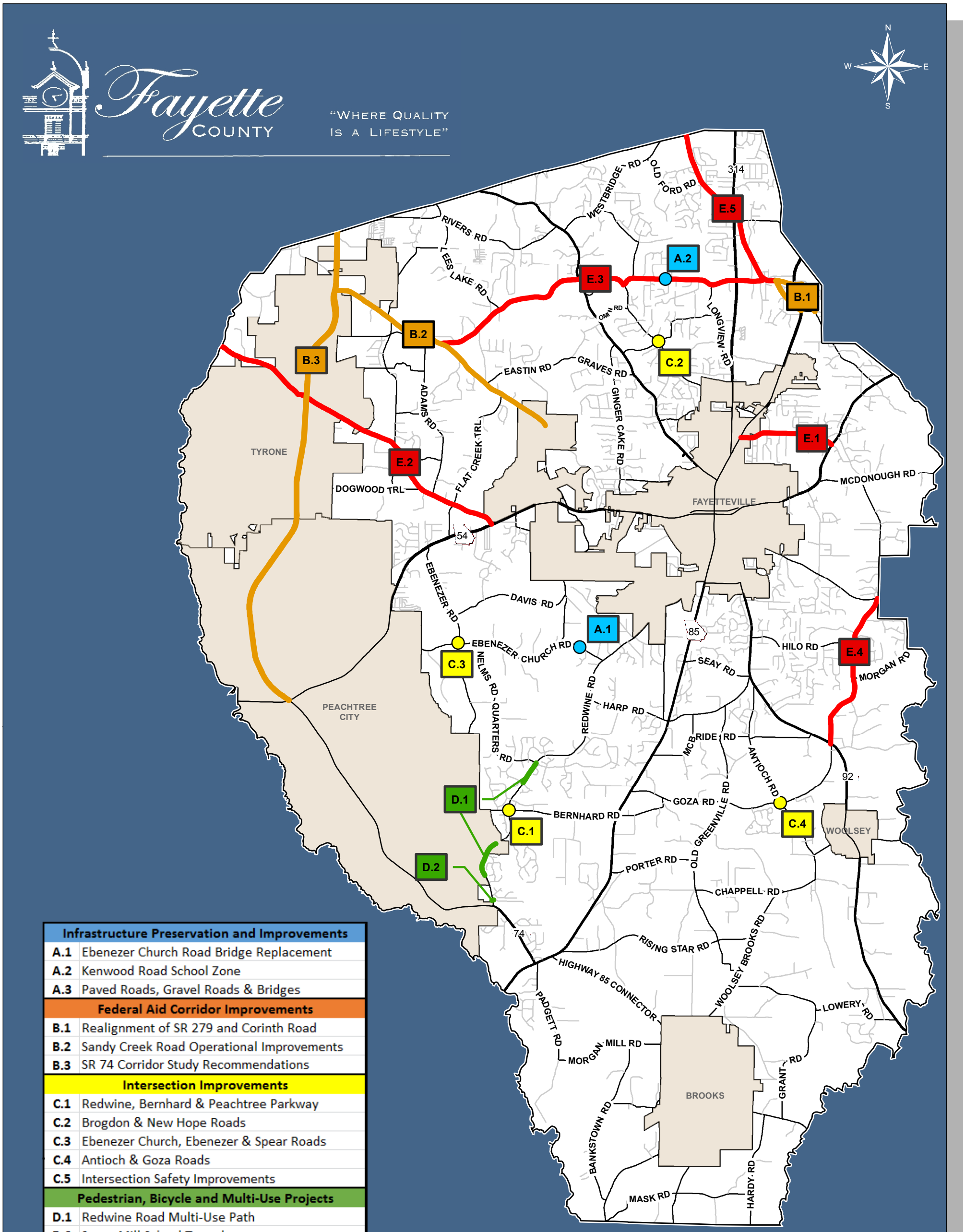
Transportation Overview

QUESTIONS

SPLOST 2017 Transportation Improvements Draft for Public Comment

Fayette County

"Where Quality Is a Lifestyle"



Infrastructure Preservation and Improvements	
A.1	Ebenezer Church Road Bridge Replacement
A.2	Kenwood Road School Zone
A.3	Paved Roads, Gravel Roads & Bridges
Federal Aid Corridor Improvements	
B.1	Realignment of SR 279 and Corinth Road
B.2	Sandy Creek Road Operational Improvements
B.3	SR 74 Corridor Study Recommendations
Intersection Improvements	
C.1	Redwine, Bernhard & Peachtree Parkway
C.2	Brogdon & New Hope Roads
C.3	Ebenezer Church, Ebenezer & Spear Roads
C.4	Antioch & Goza Roads
C.5	Intersection Safety Improvements
Pedestrian, Bicycle and Multi-Use Projects	
D.1	Redwine Road Multi-Use Path
D.2	Starrs Mill School Tunnel
D.3	Bike Lanes and Multi-Use Paths
Scoping Studies	
E.1	Banks Road Scoping Study
E.2	Tyrone & Palmetto Roads Scoping Study
E.3	Lees Mill, New Hope & Kenwood Scoping Study
E.4	Inman Road Scoping Study
E.5	SR 279 Scoping Study
E.6	Transportation Studies

- Infrastructure Preservation and Improvements
- Federal Aid Corridor Improvements
- Intersection Improvements
- Pedestrian, Bicycle and Multi-use Projects
- Scoping Studies

Ebenezer Church Road Bridge Replacement

Category: Infrastructure Preservation and Improvements

Location: Ebenezer Church Road at Whitewater Creek Bridge

Estimated Cost:

SPLOST Match	$659,500
Federal/State Match	$3,062,983
Total Cost	**$3,722,483**

Project Description

This is a Georgia Department of Transportation (GDOT) sponsored bridge replacement project that is currently in the early stages of design.

The existing bridge, built in 1965, and consists of four spans of reinforced concrete deck girders on steel piles, concrete columns and concrete caps. The overall condition of the bridge is good, the design vehicle used for the bridge is below current standards, so the bridge is posted with weight restrictions.

The new structure will be wider and meet all current design standards. Fayette County is working with GDOT to coordinate the new design with possible future bike lanes or multi-use paths along Ebenezer Church Road.

Costs for the project are based on an August 24, 2016 estimate. The balance of the project ($3,620,983) will be paid with state and federal dollars. GDOT's schedule for construction is fiscal year 2019.

Map Location

Ebenezer Church Road is located southwest of downtown and can be accessed by Redwine, Lester, and Ebenezer Roads.

Existing Conditions

Ebenezer Church Road has two bridges. One crosses at Whitewater Creek and second at Pelham Creek. This project is for bridge replacement over Whitewater Creek, which is located between Hideaway Drive and Lester Road.

Kenwood Road School Zone

Category: Infrastructure Preservation and Improvements

Location: Kenwood Road at North Fayette Elementary

Estimated Cost: $600,000

Project Description

This is a Fayette County safety project on Kenwood Road.

This project provides design and construction of center left turn lanes on Kenwood Road for the North Fayette Elementary School.

Providing turn lanes will reduce the risk of rear-end collisions and reduce delays to thru traffic. The design process would include soliciting input from the School System, Sheriff's Office, and other stakeholders in the area.

The project would be funded entirely with SPLOST dollars.

Existing Conditions

Proposed Project

Paved Roads, Gravel Roads, and Bridges

Category: Infrastructure Preservation and Improvements

Location: Multiple Locations

Estimated Cost: $2,209,273

Project Description

This project will help maintain existing roads and bridges in the unincorporated County.

Each year the Fayette County Road Department repairs and resurfaces four to five percent of the paved roads in the unincorporated County. The Department also maintains the County's bridges and approximately 50 miles of gravel roads.

This project will provide additional resources for asphalt resurfacing, other pavement preservation treatments, bridge work, shoulder grading, drainage improvements, dust control treatments, etc. Treatment technologies and work priorities will be established using the results of a comprehensive 2016 Pavement Evaluation.

Resurfacing and other maintenance work will be funded entirely with SPLOST dollars, but opportunities may exist to use the money as local match against state or federal aid.

Paved Roads

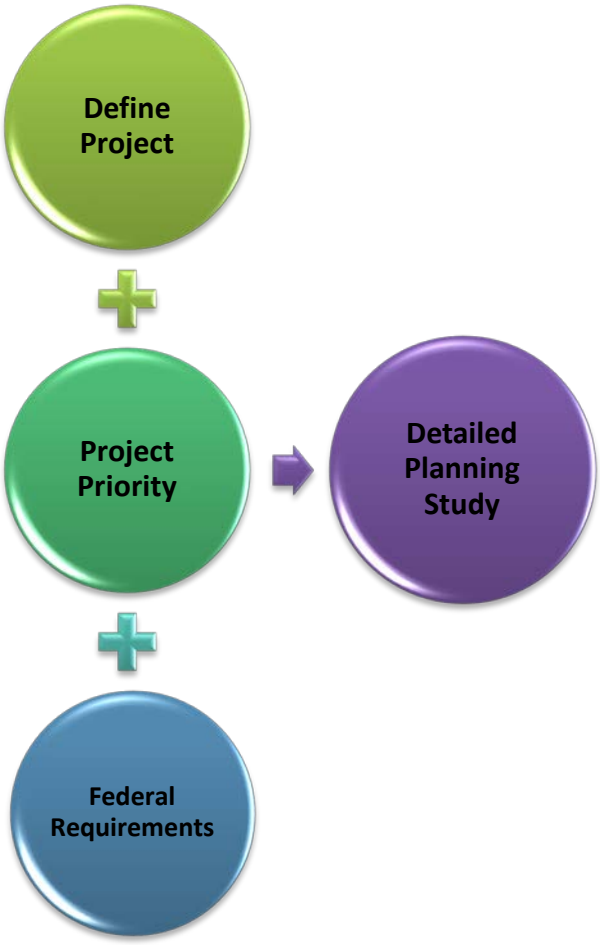
Gravel Roads

Bridges

Detailed Planning Studies

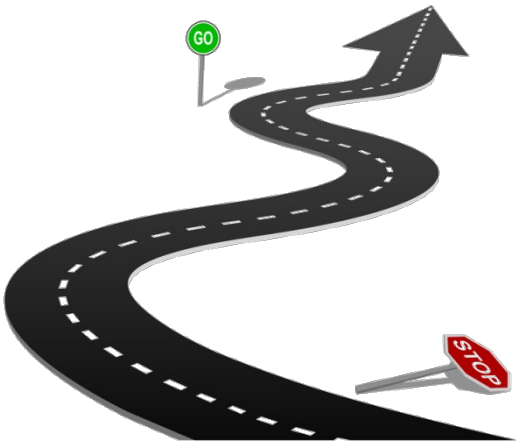
Approximately 3.2% of the SPLOST transportation dollars are allocated for Detailed Planning Studies. The studies have three primary purposes:

1. Define the project;
2. Assist with project prioritization; and
3. Satisfy federal requirements.



On large corridor projects, considerable data collection and engineering analysis is required to make accurate project recommendations. A Detailed Planning Study will collect the minimum data to allow for these analyses and provide results and recommendations for the Board of Commissioners to prioritize and advance the highest-rated projects. Having this information is prudent for local officials making decisions on projects with cost estimates in the tens-of-millions range and is required by state and regional planning agencies if the project is to be competitive in seeking Federal-aid.

Each of the Detailed Planning Studies will complete common tasks in order to address the three goals noted above, including:



- Identify need and purpose;
- Define the project scope;
- Consider alternatives;
- Perform cursory environmental screening;
- Assess impacts to utilities and railroads;
- Assess impacts to private properties;
- Gauge public support and opposition;
- Identify applicable design criteria;
- Develop a schedule; and
- Determine preliminary budget and funding options.

Studies will be completed for the seven projects listed below and possibly other locations as needs change over the six-year SPLOST. It is expected that Federal-aid will be required, at least for the construction phase, to fully fund any one or more of the projects. The advantage of having a project in the Federal-aid program is the potential amount of money paid by state or federal agencies. Typically the ratio is 80/20 (federal/local), so a project costing $15,000,000 could receive up to $12,000,000 in federal and state aid, and only cost the County's SPLOST program $3,000,000. The process for being awarded Federal-aid is competitive due to the large number of project applications, uncertainties associated with federal funds and availability, and the pre-defined criteria/performance measures a project must meet to be ranked high. Hence the need for a Detailed Planning Study to properly "vet" Fayette County projects prior to submission for consideration against the other projects in the Atlanta Metropolitan region.

As described above, the information provided in a Detailed Planning Study is essential for the funding process. The information is also integral to the design process; so much of the work completed in the planning stage is used in full design. Also, having a planning study allows Consultants and Engineers to provide more focused and cost-effective proposals for full design.

SPLOST-funded Detailed Planning Studies

- Realignment of SR 279 and Corinth Road
- Sandy Creek Road Operational Improvements
- Banks Road Operational Improvements
- Tyrone & Palmetto Roads Operational Improvements
- Lees Mill, New Hope and Kenwood Road Operational Improvements
- Inman Road Operational Improvements
- SR 279 Capacity and Operational Improvements
- Other Transportation Studies, as needed

For budgeting purposes, it is assumed that the Detailed Planning Studies will be 100 percent SPLOST funded, although there is a possibility of receiving Federal-aid to offset the cost from some of the studies. If this is achieved, savings can be used for additional studies or rolled over to another project type, such as resurfacing or intersection improvements.

(The SR 279 Capacity and Operational Improvement Study is different from the other studies in that the recommendations of the study are not eligible for implementation with SPLOST money. Since this project is entirely along a State Route, the study will be used to encourage the Georgia Department of Transportation to advance the project using state and federal dollars.)

Banks Road Operational Improvements

Banks Road is a 1.7-mile road extending from SR 54 to SR 314. The western end of Banks Road (approximately 0.38 miles) is within the limits of Fayetteville. The road is used a cut-thru between SR 314, SR 85, SR 54 and McDonough Road but is not properly designed for current (and future) traffic volumes and pedestrian demands. For example, a 1.25 mile stretch of Banks has 10 intersections, 25 residential driveways, and approximately 250 acres of undeveloped land with existing road frontage on Banks. There are no sidewalks, bike lanes or multi-use paths.

This project will ensure Banks Road is improved to meet current and future transportation demands. Possible improvements could include: capacity increases (e.g., addition of a third lane), shoulder build-out, turn lanes, different intersection controls, correction of sub-standard horizontal and vertical curves, and addition of sidewalks, bike lanes and/or multi-use paths. Similar to the other Corridor Projects, the specific scope will be determined from the Detailed Planning Study.

Tyrone Road and Palmetto Road Operational Improvements

Tyrone Road is a 4.5-mile major road extending from SR 54 to Senoia Road in Tyrone. Palmetto Road is also a major road running 1.7 miles from Senoia Road to the Coweta County border. Palmetto Road is often used for access to Interstate I-85 at the Collinsworth Road interchange (Exit 56). Approximately 1.5 miles of the corridor are within the limits of Tyrone. With the exception of the Tyrone portion the majority of this corridor has no pedestrian or bicycle accommodations. Many side street intersections have poor skew angles and restricted sight distance. The annual average traffic count varies from 5,690 to 8,400 vehicles per day.

This project will ensure Tyrone Road is improved to adequately meet current and future transportation needs. Possible improvements may include: capacity increases (e.g., addition of a third lane in select areas), shoulder build-out, turn lanes, different intersection controls, correction of sub-standard horizontal and vertical curves, and addition of sidewalks, bike lanes and/or multi-use paths. Similar to the other Corridor Projects, the specific scope will be determined from the Detailed Planning Study.

Some specific intersections to be realigned or changed to a difference type of intersection control (e.g., a roundabout) include: Arrowood Road and Spencer Lane with Palmetto Road; Ellison Road and Tyrone Road; Dogwood Trail with Tyrone Road; and Flat Creek Trail with Tyrone Road.

This is a joint effort with the Town of Tyrone and they are supportive of the project.

Lees Mill Road, New Hope Road and Kenwood Road Operational Improvements

When considered as one corridor, these three roads provide east-west connectivity in the north part of Fayette County, with intersections at Sandy Creek Road, Veterans Parkway, SR 92, SR 314, SR 279 and SR 85 (only a small portion of new Hope Road is included in the project). The roads are all two-lane, County Arterials. There are no sidewalks, bike lanes or multi-use paths along these two-lane major county roads. The annual average traffic count varies from 2,190 to 2,650 vehicles per day.

This project will provide safety and operational improvements along the corridor, including intersection improvements and possible addition of bike lanes, sidewalks and/or multi-use paths. Public input will be sought to determine latent demand for these features. Possible improvements include: shoulder build-out, turn lanes, different intersection controls, correction of sub-standard horizontal and vertical curves, installation of guardrails, and addition of sidewalks, bike lanes and/or multi-use paths. Similar to the other Corridor Projects, the specific scope will be better defined with the Detailed Planning Study.

Inman Road Operational Improvements

Inman Road extends from County Line Road at South Jeff Davis Road to SR 92 across from Goza Road. It is a two lane road, posted at 35 mph, and has no stop signs or traffic signals between the termini intersections noted above. Traffic is expected to increase on Inman as growth continues in Spalding and Coweta Counties, and with construction of the East Fayetteville Bypass, that will provide a direct path from Inman Road to SR 85 north of Fayetteville. Traffic on Inman is approximately 2,410 vehicles per day. A common complaint received from citizens about Inman Road is significant speeding.

This project will ensure Inman Road is maintained as free-flow road meeting current and future transportation needs for safety and efficient traffic movement. Possible operational improvements include: addition of turn lanes at intersections and passing lanes, shoulder build-out and establishment of proper clear zones, correction of sub-standard horizontal and vertical curves, and guardrail installations.

Redwine, Bernhard, and Peachtree Parkway

Category: Intersection Improvements

Location: Redwine Road, Bernhard Road and Peachtree Parkway

Estimated Cost: $1,200,000

Project Description

This is an existing 4-way stop intersection that experiences heavy delays in the morning and afternoon. It also has multi-use paths along Redwine Road that are frequently used by local residents for access to the Stars Mill School complex, shopping/dining, golf, recreation, exercise, etc. Morning queues of 25 cars or more is common on Redwine Road.

The intent is to improve operating conditions during AM and PM peak hours and improve the ability of pedestrians, bicyclists, and golf carts to safely cross the roads.

A roundabout is envisioned for the location, but the design process will consider various alternatives and make a recommendation for the Board of Commissioner's approval prior to the full design phase. A concern with roundabouts is how they are integrated with the multi-use paths. This will be evaluated during the design process. One option is to provide marked cross-walks a short distance away from the roundabout, thereby providing separation between the turn-movements of the roundabout and the crossing. Signs, striping, landscaping, lighting, reflective pavement markers, etc. will all be provided, as applicable, for the project.

Existing Conditions

The current design consists of a four way stop controlled intersection with stop signs and multiuse paths.

Proposed Project

The work may include realignments, changing the intersection control, addition of turn lanes, new signs, striping and/or reflective pavement markers, addition of night time lighting, etc.

Brogdon and New Hope Roads

Category: Intersection Improvements

Location: Brogdon and New Hope Roads

Estimated Cost: $1,200,000

Project Description

This existing two-way stop intersection generates frequent complaints about traffic speed on New Hope Road, limited sight distance, and vehicles pulling out in front of traffic. There are no sidewalks or multi-use paths in the area.

The project will improve safety and reduce speeds on New Hope Road. The design process will consider all options and make a recommendation for Board of Commissioner approval prior to full design.

Options may include roadway realignment for improved sight distance and intersection conversion to a four-way stop. The project's budget is based on conversion to a roundabout. Signs, striping, landscaping, lighting, reflective pavement markers, etc. will be provided.

Existing Conditions

The current design consists of a controlled intersection with stop signs on Brogdon Road.

Proposed Project

The work may include realignments, changing the intersection control, addition of turn lanes, new signs, striping and/or reflective pavement markers, addition of night time lighting, etc.

Ebenezer Church, Ebenezer and Spear Roads

Category: Intersection Improvements

Location: Ebenezer Church, Ebenezer and Spear Roads

Estimated Cost: $1,500,000

Project Description

This location has two intersections offset from each other by approximately 150 feet. The intersections generate above-average complaints about vehicle speed on Ebenezer Road and sight distance limitations. Ebenezer Church and Spear Roads are each stop-controlled.

There are no sidewalks or multi-use paths in the area but there is high bike use, especially on weekends. Both Ebenezer and Ebenezer Church Roads are designated in the 2010 Comprehensive Transportation Plan as future bike-path roadways.

This project's goal is to improve safety, reduce vehicles speeds on Ebenezer Road, and optimize the intersections with bike use and future multi-use path expansion.

The design process will consider all options and make a recommendation for Board of Commissioner approval prior to full design. Options may include roadway realignment for improved sight distance and intersection conversion to a four-way stop. The project's budget is based on conversion to a roundabout. Signs, striping, landscaping, lighting, reflective pavement markers, etc. will be provided as applicable.

Existing Conditions

The current design consists of a controlled intersection with stop signs on Spear and Ebenezer Church Roads.

Proposed Project

The work may include realignments, changing the intersection control, addition of turn lanes, new signs, striping and/or reflective pavement markers, addition of night time lighting, etc.

Antioch and Goza Roads

Category: Intersection Improvements

Location: Antioch and Goza Roads

Estimated Cost: $1,070,000

Project Description

This is an existing two-way stop intersection with stop control on Goza Road. The intersection was realigned in 2011 to eliminate an offset between Goza Road and add turn lanes to each of the four approaches. Rarely does the number of vehicles exceed two or three cars in any direction but safety remains an issue at this location. Since 2011, the crash rate remains higher than average and Fayette County has received several requests for changes at this intersection.

The goal of the project is to further study the intersection and make safety improvements to reduce the crash rate. The design process will consider all options and make a recommendation for Board of Commissioner approval prior to full design. Options may include roadway realignment for improved sight distance and intersection conversion to a four-way stop. The project's budget is based on conversion to a roundabout, signs, striping, landscaping, lighting, reflective pavement markers, etc. will be provided as applicable.

Existing Conditions

The current design consist of a controlled intersection with stop signs, turn lanes and rumble strips long Goza Road and turn lanes along Antioch Road.

Proposed Project

The work may include realignments, changing the intersection control, addition of turn lanes, new signs, striping and/or reflective pavement markers, addition of night time lighting, etc.

Redwine Road Multi-Use Path

Category: Pedestrian, Bicycle and Multi-Use Path Projects

Location: Redwine Road

Estimated Cost: $556,680 – SPLOST
$1,073,000 – Federal/State
$1,629,680 – Total Cost

Project Description

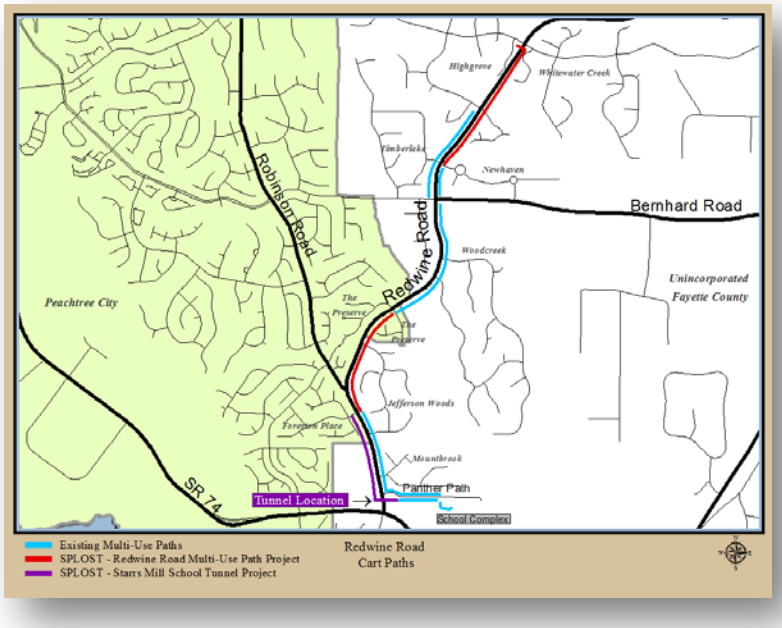
This is an existing, federal-aid, design-build project installing 1.5 miles of new multi-use path along Redwine Road. When complete, there will a continuous path along Redwine Road from Birkdale Drive to Panther Path. The project will also include an at-grade crossing of Redwine Road near the Birkdale Drive and Quarters Road intersection.

The project expands the existing path system, providing convenient and safe transportation alternatives. Common path uses include trips to school, church, neighbors, shopping, dining, golf, exercise, etc.

The project is currently in the land acquisition phase by the County. It will be advertised and awarded for design-build/construction by GDOT.

Existing Conditions

Proposed Project



Starr's Mill School Tunnel

Category: Pedestrian, Bicycle and Multi-Use Path Projects

Location: Redwine Road at Panther Path

Estimated Cost: $900,000

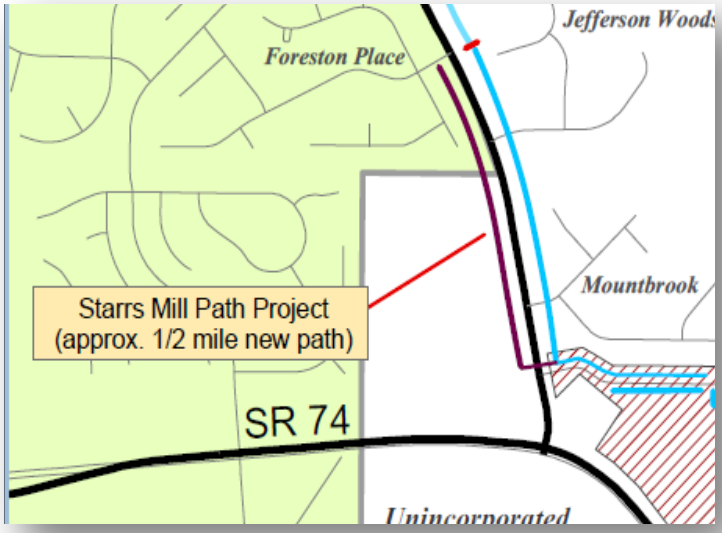
Project Description

This path project provides a tunnel under Redwine Road at Panther Path, the entrance to the Starr's Mill School complex. A tunnel provides pedestrians, bicyclists and golf carts safe passage across Redwine Road without impacting vehicular traffic. It includes construction of a new path (approximately 0.5 miles) on the west side of Redwine Road from Summer Place to Panther Path.

The intent is to provide a permanent and safe crossing option for path users who are on the west side of Redwine Road to the school complex.

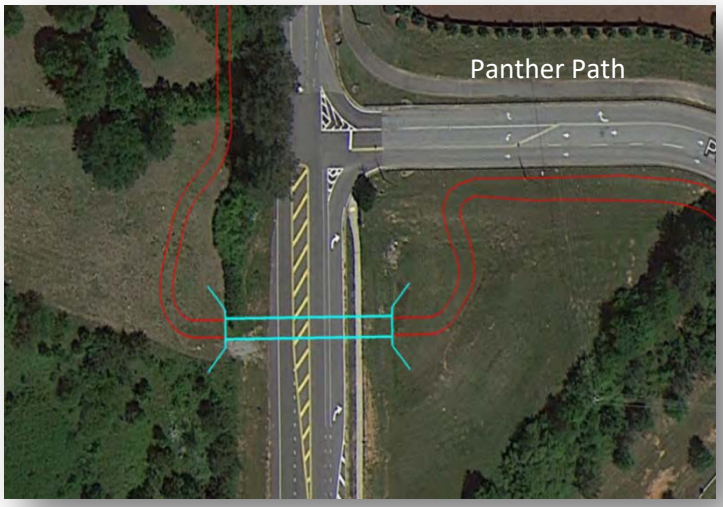
A 2015 survey counted approximately 600 golf cart trips per day along Panther Path with half originating from the west side of Redwine Road at the Summer Place.

Map Location



The blue portion in the above map identifies existing multi-use paths that are located east of Redwine Road. The purple portion identifies the new multi-use path that will be installed with this project.

Proposed Project



It is anticipated that a multi-use path along the west side of Redwine Road would significantly reduce the number of carts and pedestrians crossing Redwine Road and the hazardous intersection of Foreston Place. The concrete tunnel will be installed south of Panther Path allowing safe passage for carts and pedestrians.

Bike Lane and Multi-Use Paths

Category: Pedestrian, Bicycle and Multi-Use Path Projects

Location: Multiple Locations

Estimated Cost: $250,000

Project Description

Within unincorporated Fayette County, there is a disconnected system of bike lanes, designated bike routes, sidewalks and multi-use paths. Independent of the 2017 SPLSOT referendum, Fayette County is completing a Comprehensive Path Plan which will make recommendations for short and long-term projects to connect these systems and establish uniform and appropriate standards for signs and pavement striping.

This project will provide some funding for the implementation of some the Path Plan recommendations. Some of the money may be used as local match for a larger Federal-aid Project, depending on the specific recommendations and available federal-aid opportunities.

Examples of anticipated projects include: installation and improvements of crossings; construction of new paths or bike lanes; and installation of new bike route signs along designated routes. The emphasis of all projects will be on improved safety and connectivity.

SR 279 and Corinth Road Realignment

Category: Federal Aid Corridor Improvements

Location: SR 279 and Corinth Road at the intersection of SR 85

Estimated Cost:

SPLOST: Detailed Planning Study	$64,500
SPLOST: Construction Match	$4,500,000
Federal/State: Construction	$18,000,000
Total Cost	**$22,500,000**

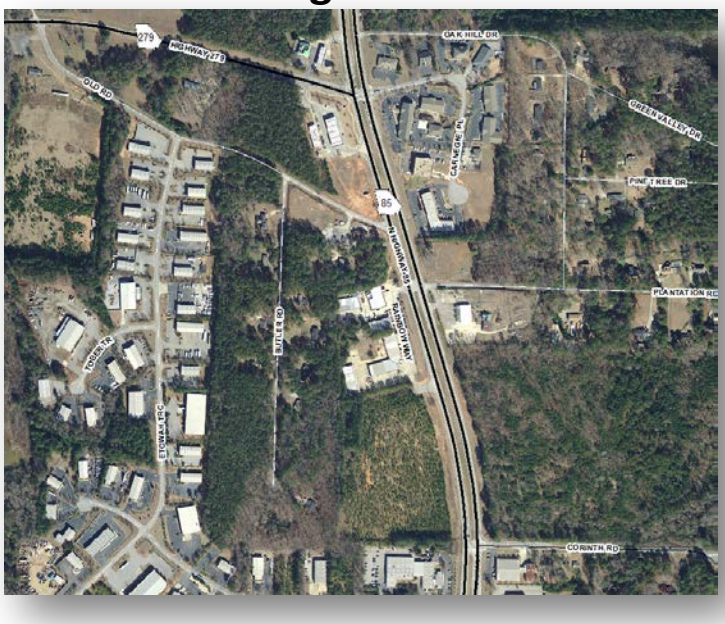
Project Description

SR 279 and SR 85 intersect approximately one-half mile north of the Corinth Road intersection. Both intersections are controlled with traffic signals. There is often a large queue of traffic making left turns from SR 85 onto SR 279 (especially in the AM) and Corinth Road (in the PM). Completion of the East Fayetteville Bypass is expected to increase traffic on Corinth Road and these intersections.

This project aligns Corinth Road and SR 279, thereby eliminating a traffic signal and the associated turning movements. Doing so improves safety and operational efficiency (i.e., less delay). The project requires Federal-aid and support from the Georgia Department of Transportation (GDOT) since it involves two state routes.

This project's Detailed Planning Study will consider all options for bringing these intersections together, as well as other safety and operational improvements. It will quantify the costs and benefits of each option allowing a go/no-go decision to be made along with selection of a preferred alignment.

Existing Conditions



SR 85 at Corinth Road

SR 85 at SR 279

Sandy Creek Road

Category: Scoping Study/ Potential Federal-aid Project

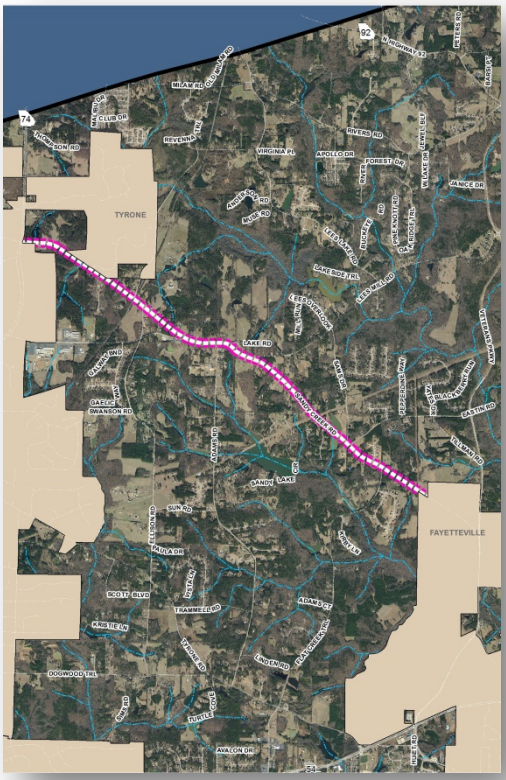
Location: Sandy Creek Road

Project Description

Sandy Creek Road is a 4.6-mile major road extending from Veterans Parkway in Fayetteville to SR 74 in Tyrone. Recent and expected growth within Fayetteville and around the Pinewood Studios is expected to increase traffic on Sandy Creek Road. Fayette County received feedback from citizens with concerns about intersection safety, increasing truck use, and vehicle speeds.

This project develops a plan to ensure Sandy Creek Road is improved in a way that adequately meets current and future transportation needs. Examples of possible operational improvements include: reconfiguration of intersections, addition of passing lanes, shoulder improvements, correction of sub-standard horizontal and vertical sight distances, an improved railroad crossing, and measures to balance growth demands with existing property owner needs and desires along the corridor.

Location



Existing Conditions

Possible Intersection Reconfiguration : Sandy Creek Road, Eastin Road, Sams Drive and Trustin Lake Drive

SR 74 Corridor Study Recommendations

Category: Federal Aid Corridor Improvements

Location: State Route 74

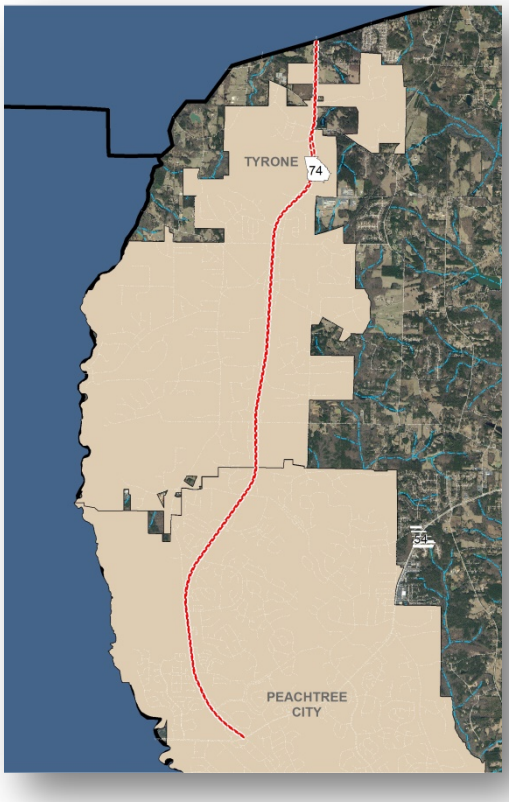
Project Description

There is an existing, multi-jurisdictional corridor study for SR 74 that extends approximately 12 miles, from SR 54 in Peachtree City to U.S. 29 in Fairburn. The study is broad in scope and is expected to generate several specific recommendations with respect to access management, intersection controls, sidewalks and paths, frontage roads, landscaping, right-of-way maintenance, etc. Approximately one mile of the corridor is within the unincorporated County.

The intent of this project is to have some funds available for the implementation of some recommendations from the study along the unincorporated areas. Depending on the specific recommendation(s), they may be strong candidates for Federal-aid.

As of December 2016, procurement for the SR 74 study is underway. The study should take approximately 18 months so final recommendations will be available in late 2018. Depending on the recommendation, implementation may also be dependent upon coordination with Peachtree City, Tyrone and Fairburn.

Location



Banks Road

Category: Scoping Study/ Potential Federal-aid Project

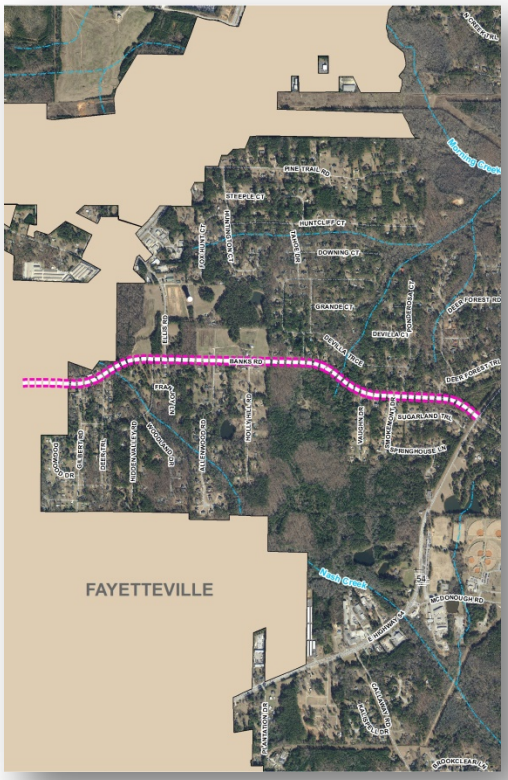
Location: Banks Road

Project Description

Banks Road is a 1.7-mile road extending from SR 54 to SR 314. The western end of Banks Road (approximately 0.38 miles) is within the limits of Fayetteville.

The road is used a cut-thru between SR 314, SR 85, SR 54 and McDonough Road but is not properly designed for current (and future) traffic volumes and pedestrian demands. For example, a 1.25-mile stretch of Banks has 10 intersections, 25 residential driveways, and approximately 250 acres of undeveloped land with existing road frontage on Banks. There are no sidewalks, bike lanes or multi-use paths.

This project will ensure Banks Road is improved to meet current and future transportation demands. Possible improvements could include: capacity increases (e.g., addition of a third lane), shoulder improvements, turn lanes, different intersection controls, correction of sub-standard horizontal and vertical sight distances, and addition of sidewalks, bike lanes and/or multi-use paths. Similar to the other Corridor Projects, the specific scope will be determined from the Detailed Planning Study.



Inman Road

Category: Scoping Study/ Potential Federal-aid Project

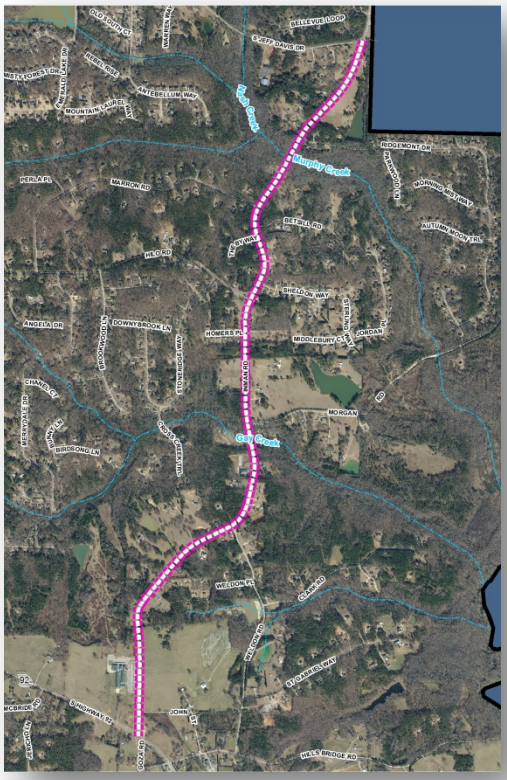
Location: Inman Road from County Line Road at South Jeff Davis Road to SR 92 across from Goza Road.

Project Description

Inman Road is a three mile road that extends from County Line Road at South Jeff Davis Road to SR 92 across from Goza Road. It is a two lane road, posted at 35 mph, and has no stop signs or traffic signals between the intersections noted above.

Traffic is expected to increase on Inman as growth continues in Spalding and Clayton Counties and with construction of the East Fayetteville Bypass, which will provide a direct path from Inman Road to SR 85 north of Fayetteville. A common complaint received from citizens about Inman Road is the amount of vehicles speeding on the road.

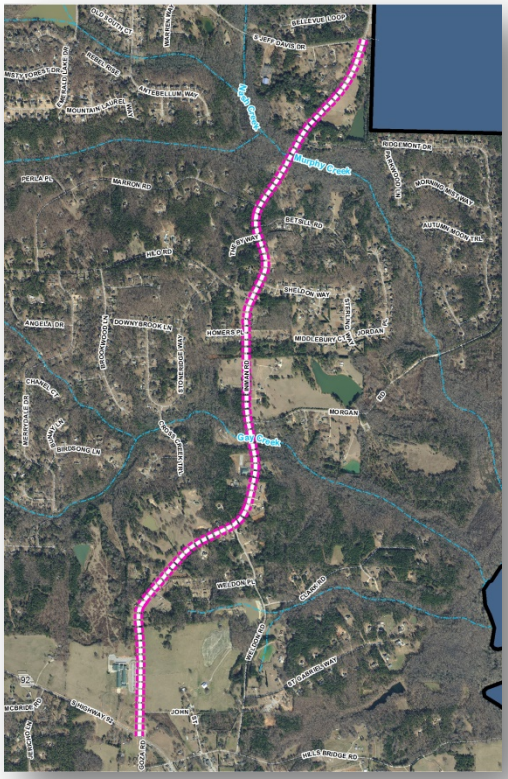
This project will ensure Inman Road is maintained as a free-flow road meeting current and future transportation needs for safety and efficient traffic movement. Possible operational improvements include: addition of turn lanes at intersections and passing lanes; shoulder build-out and establishment of proper clear zones; correction of sub-standard horizontal and vertical curves, and installation of guardrails.



Lee's Mill Road, New Hope Road, and Kenwood Road

Category: Scoping Study/ Potential Federal-aid Project

Location: Lee's Mill Road, New Hope Road, and Kenwood Road intersecting at Sandy Creek Road, Veterans Parkway, SR 92, SR 314, SR 279 and SR 85



Project Description

When considered as one corridor, these three roads provide east-west connectivity in the north part of Fayette County, with intersections at Sandy Creek Road, Veterans Parkway, SR 92, SR 314, SR 279 and SR 85 (only a small portion of new Hope Road is included in the project), which are all two-lane roads. There are no sidewalks, bike lanes or multi-use paths along the corridor.

This project will provide safety and operational improvements along the corridor, including intersection improvements and possible addition of bike lanes, sidewalks and/or multi-use paths. Public input will be sought to determine latent demand for these features. Examples of possible improvements include: shoulder build-out, turn lanes, different intersection controls, correction of sub-standard horizontal and vertical sight distances, installation of guardrails, and addition of sidewalks, bike lanes and/or multi-use paths. Similar to the other Corridor Projects, the specific scope will be better defined with the Detailed Planning Study.

HOUSE BILL 316

Mandated Electronic Ballot Marking Device

BOARD OF COMMISSIONERS RETREAT

APRIL 5, 2019

House Bill 316

Significant Changes

- **House Bill 316 is based, in part, on the recommendations of the SAFE Commission and introduces significant new changes to Georgia's election laws**
- **Significant Changes include:**
  - Georgia will utilize "Ballot Marking Devices" in an uniform election system.
  - Voter Registration requirements provide an applicant greater opportunities to verify their identity.
  - Voters will stay on the inactive list longer before being removed from voter rolls.
  - Georgia will enroll in a 25-state collaboration to track and cancel voters who move out of state.

House Bill 316

Significant Changes (cont'd)

- Requirements for removing felons have been revised.
- Consolidating precincts is more restrictive.
- Absentee voting opportunities are loosened for individuals in certain situations.
- Additional steps are required before a provisional ballot can be rejected.
- There are more days to certify an election due to audits being required.

Ballot Marking Devices

Benefits	Concerns
Supported almost unanimously by elections officials across the state	Will the County be provided with enough machines and equipment?
Similar to machines used by Georgia voters for two decades	Unknown budgetary impact to the County including maintenance agreements, paper, additional staffing, storage, etc.
Voter's intention is clear	How often will the system be overhauled in the future? Every five years? Every twenty yeas?
No distinction required for handicapped voters	

Conclusion

- More information is yet to come that could impact the benefits and concerns to date.
- Currently difficult to draw reliable conclusions on the potential changes may impact counties, like Fayette; including impacts to budgets, resources, storage needs, staffing, and other considerations.

Ballot Marking Devices seek to utilize the strengths provided by electronic voting and paper voting while minimizing the weaknesses of both methods

HOUSE BILL 316

Mandated Electronic Ballot Marking Device

QUESTIONS

A Brief History

During and after the 2016 Presidential Election, many citizens began questioning election security throughout the United States and specifically in the State of Georgia. Election officials at all levels of government whether federal, state, or local have been questioned over whether the Direct Recording Electronic (DRE) machines and other components used in Georgia and other states could be compromised either internally or externally by foreign powers.

While no evidence has been presented to show that Georgia's voting machines have been compromised under normal election circumstances, and while no evidence has been provided that shows the votes are improperly counted, elections officials are in nearly universal agreement that Georgia needs to look hard at its elections machinery and determine what improvements and investments the state should make.

In 2017, the Center for Election Services- based at the University of Kennesaw and contracted with the Secretary of State's Office- plugged elections information onto the internet. This resulted in widespread reporting by the media about the failure of elections security, the cancellation of Kennesaw State University's contract to house the Center for Election Services, and further erosion of the public's confidence in Georgia's election system.

In 2018, House Bill 680 and Senate Bill 403 were introduced with the intention of updating Georgia's voting system and the election code. Neither bill passed legislation, but they did work to push the discussion along.

In April 2018, former Secretary of State Brian Kemp established the Secure, Accessible, and Fair Elections (SAFE) Commission in order to study different options for Georgia's next voting system. The SAFE Commission was made up of two state representatives, two state senators, four elections officials; an accessibility expert, a cybersecurity expert, two voters-at-large; and three other members representing the Republican, Democratic, and Libertarian Parties.

Toward the end of 2018, both before and after the November election, the State of Georgia and several county elections offices were sued. One such lawsuit (Donna Curling, et al., Plaintiffs, v. Brian Kemp, et al., Defendants) requested Georgia to no longer use DRE machines and instead to convert its processes immediately into paper balloting. On September 17, 2018, Judge Totenberg sympathized with the Plaintiff's as she ordered:

While Plaintiff's motions for preliminary injunction are DENIED, the court advises the Defendants [Secretary of State] that further delay is not tolerable in their confronting and tackling the challenges before the State's election balloting system. The State's posture in this litigation- and some of the testimony and evidence presented- indicated that the Defendants and State election officials had buried their heads in the sand. This is particularly so in their dealing with the ramifications of the major data breach and vulnerability at the Center for Election Services, which contracted with the Secretary of State's Office, as well as the erasure of the Center's server database and a host of serious security vulnerabilities permitted by their outdated software and system operations.

A wound or reasonably threatened wound to the integrity of a state's election system carries grave consequences beyond the results in any specific election, as it pierces citizen's confidence in the electoral system and the value of voting.

Advanced persistent threats in this data-driven world and ordinary hacking are unfortunately here to stay. Defendants will fail to address that reality if they demean as paranoia the research-based findings of national cybersecurity engineers and experts in the field of elections. Nor will surface-level audit procedures address this reality when viruses and malware alter data results and evade or suppress detection. The parties have strongly intimated that this case is headed for immediate appeal. But if the case stays or comes back to this Court, the Court will insist on further proceedings moving on an expedited schedule. The 2020 elections are around the corner. If a new balloting system is to be launched in Georgia in an effective manner, it should address democracy's critical need for transparent, fair, accurate, and verifiable election processes that guarantee each citizen's fundamental right to cast an accountable vote.

Whether from the perspective of the public, the perspective of Georgia's legislative body, or by concerns and threated future rulings expressed by the U.S. District Judge the time to revamp Georgia's elections has come.

SAFE Commission Recommendations

Based on discussions, consideration of public testimony, and other submitted documents, and after hearing from election officials (who will be tasked with using the new system and who have firsthand insight into voter experience in Georgia), experts in voting rights, cybersecurity, security, accessibility, and review multiple voting systems, the SAFE Commission- which was constituted in April 2018- made the following recommendations to the Governor, the Secretary of State, and the General Assembly in January 2019.

1) **Georgia should adopt a voting system with a verifiable paper vote record. Every effort should be made to implement this system statewide in time for the 2020 election. The system should create an auditable paper record for every vote that the voter has an opportunity to review before casting. Rules should be put in place ensuring a rigorous chain of custody for these paper records, as are in place now for security of paper ballots and memory cards.**

2) **Georgia should remain a uniform system state, with each county using the same equipment that is initially provided by the state.**

3) **The implementation of a new system should include a training plan and budget to educate both voters and county election officials.**

4) **Any new system should ensure that disabled voters have the same opportunity for access and participation as other voters in accordance with HAVA (Help America Vote Act of 2002) and the ADA (Americans with Disabilities Act.) Any new system should be certified by the EAC (United States Election Assistance Commission.)**

5) **Georgia's new voting system should include new vote casting devices, new scanners, and new poll books. There should be paper backups for each of these systems to the extent possible, including paper registered voter lists and ballots. For each new type of hardware, steps should be taken to ensure both security and functionality. Any new hardware or software needs to be compatible with Georgia's existing voter registration system.**

6) **Given Georgia's history as a state that uses DRE's (Direct Record Equipment) and the familiarity of voters and election officials with that method of vote casting, Georgia should move to a primarily ballot-marking device with verifiable paper ballots solution for a new voting system.**

7) **Georgia should require post-election, pre-certification audits. These audits will certainly be time consuming and add work to county election officials, but they are necessary to show transparency and maintain trust in the elections process.**

8) **In order to successfully implement this new system, other areas of Georgia election law should be updated to ensure compatibility with the new system and improve election administration. Some of these updates may require updates to Georgia statutes, while some may be better suited to regulations promulgated by the State Election Board.**

   Fayette County's Election Board and staff agree with all eight requirements.

House Bill 316 Introduced

In 2019, House Bill 316 was introduced into the Georgia General Assembly in response to the SAFE Commission's recommendations and in an effort to address other concerns that arose during the 2018 election. Key aspects of the bill are:

1) **New Voting Machines**
   The omnibus elections legislation provides that the state will provide new, uniform voting machines for every county in Georgia.

   The voting equipment will consist of "ballot marking devices"—electronic devices, similar to the DRE interface currently used by voters, to mark their ballots. The difference is that these devices provide a paper "scanning ballot" which can be read and reviewed by the voter prior to the voter placing the ballot in a "ballot scanner." The ballot scanner is an electronic recording device which then tabulates the votes of all ballots (also known as a tabulating machine) and stores/ retains the scanning ballots, maintaining a paper trail for auditing, if necessary.

The Governor's proposed FY2020 budget, a separate bill, contains $150 million in recommended bond funding to pay for this equipment, which, according to HB 316, the state will furnish for use in each Georgia county "as soon as possible." Should this legislation and the $150 million appropriation pass, the procurement of this equipment, as well as its distribution to counties, will ultimately be made by the Georgia Secretary of State- once that office has certified the equipment safe and practical for use.

It is anticipated that the equipment will be piloted during the 2019 municipal elections, then ready for use in the 2020 primaries and general elections. The uniform equipment will be used for all federal, state, and county general primaries and general elections, as well as special primaries and special election in the state.

Counties and cities may purchase, lease or otherwise acquire additional equipment at their own expense.

2) Voter Registration

a. Prior to notifying an applicant that their identity cannot be verified, the local board of registrars must review the application to ensure there are no data entry errors and ensure that the applicant did not provide sufficient evidence of his or her identity.
b. Not less than 30 days nor more than 60 days prior to an application being rejected, the board must mail a final notice to the applicant that her or his identification cannot be verified and that he or she must provide additional evidence of their identity.

3) Removing Inactive Voters from the Rolls

a. An elector now has five years (instead of three years) of non-activity / participation with Georgia's elections process before being placed on the inactive list.
b. An elector placed on the inactive list of electors shall remain on the list until the day after the second November general election held after the elector is placed on the inactive list of electors. If the elector makes no contact during that period, the elector shall be removed from the inactive list of electors. Not less than 30 nor more than 60 days prior to the date on which is the elector is to be removed from the inactive list of electors, the board of registrars shall mail a notice to the address on the elector's registration record.

4) Accuracy of Elections- Moving Out of State

a. Authorizes the Secretary of State to enroll Georgia in a 25-state collaboration (the Electronic Registration Council) to share voting information in order to track and cancel voters who move out of state. The Center is made up of elections officials of states and U.S. territories that are members.

b. When a person moves from Georgia and registers to vote in another state, and Georgia receives notice but not documented proof of the voter registering in the other state, the Secretary of State or board of registrars will send the elector a confirmation that his or her Georgia registration is about to be cancelled.

5) Felony Verification

a. The Secretary of State, upon receiving a list of persons convicted of felons, will contact local registrars, who must then mail a notice to the person's last known mailing address stating that the voter will be removed from the rolls 30 days after the notification, unless the person requests a hearing to contest said removal.

6) Precincts and Polling Places

a. Counties cannot divide, alter, format, or consolidate a voting precinct until at least 30 days' notice is given in the local legal organ and a copy of the notice is mailed to the Secretary of State. Current law only calls for 10 days' notice.
b. Polling places cannot be changed on Election Day, nor during the 60-day period leading up to general elections nor 30 days for special elections and runoffs, unless there is an emergency or the polling place has become unusable.
c. Electors(who are entitled to receiving voting assistance at a polling place) may receive assistance from any person so long as the helper is not their employer, an agent of the employer, or an agent of the employer, or an agent of the elector's union. Those who assist are no longer limited to 10 electors to whom they offer assistance.
d. Voter identification cards remain valid if the voter changes his or her address so long as the address remains the same county in which it was issued.
e. Counties must provide one ballot marking device per every 250 voters during elections.

7) Absentee Voting

a. Persons in a county jail or in custody, but not convicted of a felony, can now be mailed an absentee ballot to vote. An employee of the jail may mail the ballot back.
b. Absentee ballot applications cannot be rejected due to an apparent mismatch between the voter's signature on the application and their voter registration signature. In these cases, the elector will be mailed a provisional absentee ballot and instructions that he or she can cure the mismatch by submitting an affidavit to the board of registrars along with a copy of appropriate identification.
c. Electors no longer have to provide their address or year of birth on the oath provided with a returned absentee ballot.
d. Currently, a person cannot assist more than 10 disabled or non-English speaking individuals' complete absentee ballots. That limit has been removed.
e. Caregivers of a disabled person may now mail back an absentee ballot (current law allows only family members or someone else living in the household.)

f. Disabled or illiterate persons can now be assisted in voting by anyone of their choice, so long as the person assisting is not an employer, a fellow union member, a candidate, or a family member of a candidate.
g. If a voter's absentee ballot is rejected, a notice is given, and they have until the end of the period by which to verify provisional ballots to cure their absentee ballot error(s).

8) Advance and Provisional Voting

a. Election superintendents must now notify the Secretary of State (each time an elector casts a provisional ballot) whether the ballot was counted and, if not counted, the reason why.
b. Board of registrars must now go through additional steps and check additional information before rejecting a provisional ballot. Boards must also notify a voter "at the earliest time possible" that their ballot has been rejected.

9) Election Certifications and Recounts

a. Elections superintendents have four additional days to certify election returns.
b. An election's certification date can be extended by the Secretary of State if it is determined necessary to complete a precertification audit.
c. The threshold by which a candidate may request a recount has been reduced from a difference of 1 percent of the votes cast to ½ of 1 percent.
d. Rules pertaining to mandated precertification audits are revised and spelled out.
e. The Secretary of State is required to conduct a risk-limiting audit of not greater than 10 percent in one or more counties by December 31, 2021. Results must be provided to the General Assembly.

[Please note that the summary of House Bill 316 was provided by the Association County Commissioners Georgia (ACCG). ACCG is in support of House Bill 316.]

Where is HB 316 As of March 12, 2019?

On February 14, 2019, House Bill 316 was introduced in the Georgia House or Representatives. It was referred to the Governmental Affairs Committee for review.

On February 22, 2019, The Governmental Affairs Committee returned the bill to the House of Representatives as favorably reported with substitutions.

On February 26, 2019, the House of Representatives passed / adopted the substitution and immediately transmitted it to the Georgia Senate. The vote was 101 to 72 in favor.

On February 27, the Georgia Senate referred the bill to the Senate Ethics Committee.

On March 7, the Senate Ethics Committee favorably reported the bill with substitutions.

The bill is currently awaiting a vote from the Georgia Senate. If approved, the bill will be returned to the Georgia House of Representatives in order to find common ground between the changes recommended by both the House of Representatives and the Senate. No date has been set, as yet, for the Senate vote.

Ballot Marking Devices vs. Hand Marked Paper Ballots

There are two primary methods that are being considered in revamping Georgia's elections.

One method is to adopt Ballot Marking Devices (BMDs) that are similar to Georgia's current electronic voting system but that allows for printable, verifiable paper ballots. This method is supported by House Bill 316.

The second method is Hand Marked Paper Ballots (HMPB) that revert back to the older practice of printing ballots for each voter for each election. This method is not recommended in House Bill 316 but is supported by a significant number of opponents of House Bill 316. - including the Coalition of Good Governance.

The following section will provide a brief analysis of the benefits and concerns with each method.

Ballot Marking Devices

What are Ballot Marking Devices: Although there are several versions of Ballot Marking Devise systems provided by several vendors, the basic understanding is that the Ballot Marking Device is very similar to what the Georgia voter has been using for the past two decades. The chief difference is that instead of the voter being handed a yellow card that opens up an electronic ballot, the voter is handed a paper ballot- likely with a barcode- that will open the electronic ballot and allow the citizen to vote. The voter will then print the ballot and be able to visually see how the machine printed their vote. If the voter agrees with the printout, then the voter will run the ballot through a tabulating machine. The ballot is counted immediately and kept by the machine for future audits. If the voter does not like how their vote is recorded, they can spoil the ballot and print a new ballot until they are satisfied with the results. It is important to understand that the Ballot Marking Devise <u>does not record the vote it only prints the vote onto a ballot. Only when the voter runs the printed ballot through a tabulator is the ballot recorded.</u>

A pilot program for Ballot Marking Devices has already been tested during Rockdale County's 2017 Municipal Elections. Supervisor of Elections Cynthia Willingham testified to the Governmental Affairs Committee and Ethics Committee that Rockdale County had wonderful results with its pilot program and that the citizens' only complaints were why Rockdale went back to the "old" or current system for the 2018 election.

BENEFITS WITH BALLOT MARKING DEVICES

There are many benefits and some concerns with the Ballot Marking Devices (BMDs). The benefits are:

Similar to Current Machines: Ballot Marking Devices, are similar to the election machines that have been in use in Georgia for the past 20 years. This should be a benefit for the general public who are accustomed to electronic voting. This will also benefit elections personnel across the state who will likely need minimal training to operate the equipment- especially given the compressed timeframe of receiving, training, and implementing the machines.

Voters' Intent is Clear: One overriding problem with paper ballots used in Georgia and, most notoriously in Florida, was the question of discerning voter intent. Since the utilization of electronic voting equipment, the question of voter intent has been greatly mitigated. BMDs bring the best of both worlds- allowing the voter to review his or her ballot before casting it and allowing the county to maintain the paper ballot of what was cast for future audits. This is a step up from the current machines that only provide electronic votes without paper backup.

No Distinction Required for Handicapped Voters: BMDs are designed to help voters who are handicapped and, as a result, may not be able to vote on a standard paper ballot. BMDs can be set up to provide audio support for those who are sight impaired. It also helps voters who may have problems holding pens or other devices. The font and print on the machines are adjustable for easier reading. These are aspects that are simply not possible on a standard printed paper ballot.

Less Paper Ballots Printed: Paper ballots have to be printed in certain circumstances such as creating a provisional ballot or for Absentee by Mail ballots, however, in the big picture, the number of those printings are minimal and therefore manageable. The majority of the ballots are available to voters electronically. This allows for the need for lesser staff and lesser wait times for some votes as situations arise.

CONCERNS OVER BALLOT MARKING DEVICES

Many of the concerns about Ballot Marking Devices are generated from a lack of details and information. Despite the Governor's FY2020 budget allotting $150 million for the purchase of updated machines and equipment for elections, this effort is still in its early stages. So far as can be known, the Secretary of State's Office has yet to decide on what vendor- much less what version of machine- will ultimately be utilized. This creates the following concerns and open-ended questions:

Will the counties, including Fayette, be allotted enough machines? In ongoing years, how much will it cost Fayette County to add more machines?

What machines will be used and how much will they cost? As the number of voters grows in Fayette County, it may require the county- not the state- to purchase more equipment.

Repairing the equipment will be at the county's expense as it currently is. Without knowing what machines will be used, it is impossible to project how much repairs could cost.

Counties are responsible for purchasing the paper for the Ballot Printing Machines- a cost not incurred by the counties in over two decades. It is unknown, at this time, what financial impact this will have on the counties- including Fayette.

How often will Ballot Marking Device machines be updated or replaced in the future? Given that it took Georgia nearly twenty years to update its voting equipment- will the machines be replaced more often or will it be another 20 years.

Ballots that rely on barcodes may be hacked or breached, may not count a vote properly, and could compromise voter secrecy. Significant public comment had been received by the Georgia General Assembly on this matter and there is some reason to believe that barcode only ballots will not be as well received.

How much additional storage will be needed for keeping paper ballots?

Will the Ballot Marking Devices be available prior to the beginning of Calendar Year 2020? The year 2020 will be an extremely important year throughout the county, not to mention Georgia. It is hoped that the legislature and Secretary of State will not enact major elections changes in a major election year. Timing is essential.

Hand Marked Paper Ballots

Hand Marked Paper Ballots (HMPB) are the leading alternative to Ballot Marking Devices that have been considered.

HMPB are literal, paper ballots- generally printed on standard-sized paper that is given to the voter to vote upon. The voter is handed an ink pen and is permitted to complete their ballot. Upon completion, the voter is able to look over their vote and, if the ballot is marked appropriately, then the ballot is taken to a scanner that immediately tabulates the votes and keeps the ballot for auditing purposes.

The chief benefit of this approach is that it removes cyber-technology as much as possible from between the voter and his or her vote.

Why Should Hand Marked Paper Ballots Be Considered?

One member of the SAFE Commission, Dr. Wenke Lee, a professor of cybersecurity to 2,500 students per year at Georgia Tech voted against the SAFE Commission's recommendation to use Ballot Marker Devices. In a nineteen page report, Dr. Lee points to the growing threat of cyber-security and states ***"we can never know that we have completely secured any system."*** He emphasizes that "attacks have become easier and hence more prevalent." On page 14 for his report, Dr. Lee wrote:

The best approach is to use paper ballots as the durable, independent evidence to verify or determine the correct election outcome, assuming that the paper ballots have accurately captured the voters' intended votes.

Dr. Lee concluded his report giving several reasons why Hand Marked Paper Ballots (HMPB) should be considered- with the nearly universal driver being cyber-security.

Dr. Lee's concerns were heard at the Governmental Affairs Committee and Senate Ethics committee, and even prior to the vote of the House of Representatives. Each committee gave a significant amount of time to hear public comments about the future of elections in Georgia. Nearly every public speaker spoke in favor of Hand Marked Paper Ballots citing cybersecurity concerns.

One cybersecurity expert testified to the Governmental Affairs Committee that the overwhelming support given by elections officials for Ballot Marking Devices was comparable to car drivers voting for vehicles they are able to drive despite being able to understand and fix the engines of those vehicles. He suggested cybersecurity experts who support Hand Marked Paper Ballots are like mechanics who know how the engines of elections systems work and he suggested those who know how the engines

run during elections should be given greater consideration than those who actually drive elections. Of course, the counter-argument is that cyber-security experts who want Hand Marked Paper Ballots have never actually "driven" an election.

It should also be noted that the general response from cyber-security experts when county information systems are breached do not revert all the way back to having county staff work only with pens, paper, and typewriters. Cyber-security is best met with up-to-date machines and technology, evolving procedures, and most importantly well-trained and knowledgeable staff who are able to avoid the dangers.

Coalition for Good Governance Recommends Hand Marked Paper Ballots

The Coalition for Good Governance (CGG) has been part of the lawsuits against Georgia over the past year, and are notable for writing county commissioners and local election officials during the elections in 2018- asking them at times to defy Georgia Law by utilizing paper ballots despite the state's clear uniformity standard. According to the CGG, these are other reasons- apart from cybersecurity reasons-- for using Hand Marked Paper Ballots:

Elections are Less Expensive: The CGG points out that paper is much less expensive to purchase than machinery, therefore the elections will be less expensive. The CGG suggests that saved money could be utilized for other county projects and not devoted to elections.

Lines are not as Long: The CGG reports that voting lines will not be as long, meaning the voters experience is less hectic and more accommodating. Instead of elections being hampered by a certain number of voting machines, the voters will be limited only by space and the number of pens and ballots that can be distributed.

Election Results are Quicker: The CGG advocates that election results will come back to the counties, and therefore, the state faster than the current method since there are less machines to close out and secure at the end of an election day.

Concerns with Hand Marked Paper Ballots:

Numbers and Types Hand Marked Paper Ballots to Print: Fayette County generally runs between three and five elections each year. To conduct an election using Hand Marked Paper Ballots, Fayette County would have to run enough ballots for each election for every voter. For a county-wide election, there will be 35 types of ballots printed based on the number of ballot styles utilized in the county. Thirty-five different ballot styles can lead to significant poll worker and voter confusion and opens the door to multiple mistakes.

Cost of the Election: CGG is correct that that a Hand Marked Paper Ballot election is less expensive than Ballot Marking Devices- but that's true only to a certain point. Machines are, theoretically, a one-time purchase done by the state. Maintenance repairs and replacements will be funded by the counties- as is currently the situation. Hand Marked Paper Ballots require printing ballots for each voter

with a certain, unknown percentage of extra ballots for each ballot style in anticipation of some ballots being spoiled. These costs are repeated, in total, for each election. The costs will vary based on the type of election. The cost will vary based on the size of the ballot. The cost will grow as voter roles

grow. This will necessarily result in a waste of taxpayer's funds for purchasing unused ballots- and this waste is repeated for each election. The waste then accumulates election after election until any cost savings is reduced to unused, discarded paper ballots.

Hand Marked Paper Ballot Printing Machines: The CGG has suggested concerns with ballot printing can be resolved by purchasing more ballot printing machines. Not only is there a cost for ballot printing machines- some machines are $10,000 to $20,000 each, but they will almost certainly require additional staffing to properly print, collate, and distribute to the poll workers. This mitigates cost savings and has the potential of costing each county more money in the long-run for conducting elections.

Hand Marked Paper Ballots Are Not Useful to All Voters: Paper ballots have fixed font, sizes, readability, etc. Those who are sight impaired will be compelled to vote on an electronic machine where abilities to meet certain handicaps are built in (meaning electronic machines are not totally gone under this scheme). A paper ballot system that requires handicapped voters to vote on machines may cause the handicapped voters to feel singled out and disaffected.

Hand Marked Paper Ballots Do Not Fix Historical Problems: It is important to remember that the reason Georgia and other states went to electronic voting in the 2000s was due to problems with hand marked paper ballots. Whether the choices were marked with a stylus in Florida's infamous butterfly ballot, or whether one looks at former Secretary of State Cathy Cox's testimony in which she recommended Ballot Marking Devices over Hand Marked Paper Ballots, Hand Marked Paper Ballots do not account for the voters who go their own way. Some voters choose more than one candidate for office. Some do not fill the bubble in completely for their candidate. Some scratch out candidates- which can cause the ballot not to cast a vote. Others place tick marks with their pens on the ballot, causing the machine to misread votes.

Former Secretary of State Cathy Cox testified to the Senate's Ethics Committee on March 6, 2019. She stated that hand-marked ballots can cause a litany of problems. She reviewed the problems associated with the 2000 presidential election and said that in 60 Georgia counties that used hand ballots and optical scanners (as recommended by the CGG), the error rate was much higher than in other areas because voters failed to properly fill in the bubbles for candidates of their choice. "When you hand-mark a ballot you really don't have an opportunity to know whether your mark is going to get the job done," said Cox. (source: http://www.fox5atlanta.com/news/georgia-senate-committee-approves-voting-machine-bill)

Advocates for Hand Marked Paper Ballots reply that the problems occurred almost two decades ago and that technology has increased by leaps and bounds- reducing the risk of similar errors in future elections. (Ibid)

Conclusion

This report has attempted to provide information on how the State of Georgia found itself in the current situation of reconsidering voting machines and processes, to update the reader on the changes provided in House Bill 316, and to provide the benefits and concerns with the two leading methods on how to accurately count votes and restore the public's trust in the system.

Much more information has yet to come to light that could strengthen or sway findings and conclusions. Since there is still such a lack of information that would fine-tune the details, it is difficult to draw reliable conclusions on how the changes will impact counties- particularly with regard to budgets, resources, storage needs, staffing, and other considerations.

However, with the information that is currently available, it appears the best approach for Georgia and Fayette County is to support House Bill 316 and its recommendation to use Ballot Marking Devices. Ballot Marking Devices seek to utilize the strengths provided by electronic voting and paper voting while minimalizing the weaknesses both those methods have.

EMPLOYEE REFERRAL INCENTIVE PROGRAM

Policy 448.17

BOARD OF COMMISSIONERS RETREAT

APRIL 5, 2019

Policy Overview

Fayette County is constantly seeking exceptional employees to join our workforce. Current employees can be an effective recruitment tool as they know firsthand the benefits of working for the County. Employees who refer a person who is hired by the County may be eligible to receive a $250 Referral Award.

Procedures / Requirements

- Full-time and part-time employees who recruit another full-time or part-time employee are eligible to receive the incentive
- Employees must email Human Resources or forward, through their department, the recommended person's name prior to the person applying for an opening with the County.
- Human Resources will then require the referring employee to complete an Employee Referral Form.
- Once the candidate has applied for a position with the County, that applicant cannot be recommended or referred by another employee.

What Positions Do Not Qualify?

- A current part-time employee who becomes a full-time employee.
- A volunteer who becomes an employee.
- An individual who has a prior association with the County (contract, temp through an agency, prior employee, etc.) who becomes an employee.

Who is Not Eligible?

The following employees are not eligible for the incentive:

- County Administrator, Contract Employees, Division Directors, Department Heads and Assistant Department Heads
- Elected Officials
- Employees of Human Resources and any employees in a position that is considered to be a conflict of interest by the County Administrator and the Director of Human Resources
- Any employee who participates in the hiring/selection process (interviews, checks references, backgrounds, etc.)
- Any current employee who recruits an immediate family member regardless of the department the new employee is hired into.

What's the Incentive?

- If the program guidelines are satisfied, the referring employee will be eligible for a total of $250 per referral.
- A $250 gift card will be awarded to the referring employee once the new employee has been hired and has commenced employment with the County.
- The referring employee must be on active payroll when the gift card is awarded.

EMPLOYEE REFERRAL INCENTIVE PROGRAM

Policy 448.17

QUESTIONS

HR-GENERAL EMPLOYEE POLICIES
Employee Referral Incentive Program
448.17

PURPOSE

This document defines the Employee Referral Incentive Program and the guidelines and rules under which it will operate.

POLICY

Fayette County is constantly seeking exceptional employees to join our workforce. Current employees can be an effective recruitment tool as they know firsthand the benefits of working for the County. Employees who refer a person, who is hired by the County, may be eligible to receive a $250 Referral Award.

PROCEDURE

Requirements

Employees must email Human Resources or forward, through their department, the recommended person's name **prior to the person applying for an opening with the County**. Human Resources will then require the referring employee to complete an Employee Referral Form. Once the candidate has applied for a position with the County, that applicant cannot be recommended or referred by another employee.

Eligibility

Full-time and part-time employees who recruit another full-time or part-time employee are eligible to receive the incentive. The following employees are not eligible for the incentive:

- County Administrator, Contract Employees, Division Directors, Department Heads and Assistant Department Heads
- Elected Officials
- Employees of Human Resources and any employees in a position that is considered to be a conflict of interest by the County Administrator and the Director of Human Resources
- Any employee who participates in the hiring/selection process (interviews, checks references, backgrounds, etc.)
- Any current employee who recruits an immediate family member regardless of the department the new employee is hired into.

Note that the following do not qualify as recruitment under this program:

1. A current part-time employee who becomes a full-time employee.
2. A volunteer who becomes an employee.
3. An individual who has a prior association with the County (contract, temp through an agency, prior employee, etc.) who becomes an employee.

Amount of Referral Award and Distribution

If the program guidelines are satisfied, the referring employee will be eligible for a total of $250 per referral. A $250 gift card will be awarded to the referring employee once the new employee has been hired and has commenced employment with the County. The referring employee must be on active payroll when the gift card is awarded.

Should the referring employee or the new employee leave the County at any time, the referring employee will not be entitled to further payment.

BOC Approval: _____

FY2020 BUDGETARY IMPACTS

BOARD OF COMMISSIONERS RETREAT

APRIL 5, 2019

HEALTHCARE ANALYSIS

Healthcare Analysis

Healthcare Renewal 8.4% Increase

Dollar Impact			
Fund	FY 2019 Budget	% Allocation	Healthcare Allocation
General Fund	4,362,206	64.70%	446,966
Emergency 911	268,778	3.99%	27,564
Juvenile Court	11,322	0.17%	1,174
Fire Services	1,041,319	16.46%	106,664
EMS	396,809	15.44%	40,690
Water System/Marshal	655,647	9.72%	67,149
Solid Waste	6,268	0.09%	622
Total	**$6,742,349**	**100.00%**	**$690,829**

Healthcare Renewal Impact

- Funding required for 8.4% Healthcare Renewal - $690,829
  - No change Employee Healthcare Rates
  - No change Individual Deductibles
  - Increase Individual & Family Out-of-Pocket Maximums

- Rollback Millage Rate – Growth in Property Digest / Taxes will Cover Increase
  - Millage Rate at 4.097 - Full Rollback
  - Includes primary major revenues sources – Property Taxes, LOST, and TAVT

PUBLIC SAFETY COMPENSATION ANALYSIS

Public Safety Concerns

Competitive Salary & Retirement

- Public Safety Agencies nationwide report an overall downturn in applicants. An overall downturn creates a more competitive recruitment climate.
- Compensation is more inclusive than just salary and includes other benefits such as health insurance, vacation, retirement, work schedules, and equipment.
- However, salary is the most frequently cited reason by public safety officers on why they leave. Statistically, unhappy employees will leave for 5%, and satisfied employees generally require a 20% increase before they consider resigning.
- Recruiting and retaining good employees require competitive salaries that match or exceed the local market average.
- Defined benefit (DB) retirement benefits is another key factor and provides a clear message to employees that management is committed to a long-term relationship.

Public Safety Assumptions

Competitive Salary & Retirement – Focus Retention/Staffing

- Recruitment and Retention of Public Safety positions. (Sheriff Office; Fire, EMS; Marshal and 911 positions)
- Public Safety positions represent 53.5% of the workforce
- Focus on Base Starting Pay & Retirement Options
- Analysis and Options proposed are based upon increasing a Public Safety Deputy Sheriff Base Pay from $38,609.44 to $42,117.13; Dollar $3,507.69 or percent 9.09%.

Public Safety Assumptions

Competitive Salary & Retirement – Focus Retention/Staffing

- Option #1 Public Safety positions
  - Allocates $3,507.69 increase to each Public Safety position
  - Remainder of workforce eligible for a 5.0% merit increase based upon employee performance utilizing a forced bell curve allocation of 15-35-35-15.

- Option #2 Public Safety positions
  - Allocates a 9.09% percent increase to each Public Safety position
  - Remainder of workforce eligible for a 5.0% merit increase based upon employee performance utilizing a forced bell curve allocation of 15-35-35-15.

- Option #3 Retirement Multiplier
  - Increasing Retirement Multiplier 1.50 to 2.00
  - Employee Contribution doubles 2.50% to 5:00%

Option #1

Base Salary Public Safety positions Dollar Increase $3,507.69

- Approximately each Public Safety positions increased $3,507.69 per scale
- Remainder of workforce 5.0% forced bell curve – effective 3.25%

Dollar Impact			
Fund	Public Safety $3,507.69	Remaining County Employees (Merit Avg 3.25%)	Total Impact
General Fund	764,676	436,176	1,200,852
Emergency 911	119,261		119,261
Juvenile Court		771	771
Fire Services	371,815	3,031	374,846
EMS	133,292		133,292
Water System/Marshal	14,031	108,523	122,554
Solid Waste		1,522	1,522
Total	**$1,403,076**	**$550,023**	**$1,953,099**

Option #1
Compensation Impact

- Funding required for 8.4% Healthcare Renewal - $690,829
- Funding Option #1 (Dollar Public Safety & Forced Merit) - $1,953,099
- Grand Total Required = $2,643,928

- Partial Rollback and Growth in Property Digest / Taxes will Cover Increase
  - Millage Rate at 4.290
  - Estimated Property Tax Increase 4.73%
  - Includes primary major revenues sources – Property Taxes, LOST, and TAVT

  - For a $250,000[1] Home Value, Resident Annual Property Tax Increase:
    - General Fund $10.60/annual or $0.88/month
    - EMS portion $0.76/annual or $0.06/month

[1]Assumes a 4.73% increase in home value to $261,825

Option #2

Base Salary Public Safety positions Percent Increase 9.09%

- Approximately each Public Safety positions increased 9.09% per scale
- Remainder of workforce 5.0% forced bell curve – effective 3.25%

Dollar Impact			
Fund	Public Safety 9.09%	Remaining County Employees (Merit Avg 3.25%)	Total Impact
General Fund	974,907	436,176	1,411,083
Emergency 911	128,596		128,596
Juvenile Court		771	771
Fire Services	516,148	3,031	519,179
EMS	171,838		171,838
Water System/Marshal	18,939	108,523	127,462
Solid Waste		1,522	1,522
Total	**$1,810,428**	**$550,023**	**$2,360,451**

Option #2
Compensation Impact

- Funding required for 8.4% Healthcare Renewal - $690,829
- Funding Option #2 (Percent Public Safety & Forced Merit) - $2,360,451
- Grand Total Required = $3,051,280

- Partial Rollback and Growth in Property Digest / Taxes will Cover Increase
  - Millage Rate at 4.323
  - Estimated Property Tax Increase 5.54%
  - Includes primary major revenues sources – Property Taxes, LOST, and TAVT

  - For a $250,000[1] Home Value, Resident Annual Property Tax Increase:
    - General Fund $17.39/annual or $1.45/month
    - EMS portion $1.42/annual or $0.19/month

[1]Assumes a 5.54% increase in home value to $263,850

RETIREMENT ANALYSIS

Option #3

Retirement Multiplier Increase 1.50 to 2.00
No Change in 30-Year Cap - Employee Contribution Doubles

- Retirement Multiplier from 1.5 to 2.0; Employee Contribution increases 2.5% to 5.0%
- Funding Impacts across Fayette County:

Dollar Impact			
Fund	DB Plan YTD	% Allocation	Multiplier 2.0 (30-Yr Cap)
General Fund	141,043	63.53%	437,145
Emergency 911	5,044	2.27%	15,622
Fire Services	40,029	18.03%	124,082
EMS	12,861	5.79%	39,847
Water System/Marshal	22,697	10.22%	70,334
Solid Waste	358	0.16%	1,101
Total	**$222,031**	**100.00%**	**$688,131**

Option #3
Compensation & Retirement Impact

- Healthcare & Percent Base Salary - $3,051,280
- Funding Option #3 (30-Yr Cap & Emp Doubles Contribution) - $688,131
- Grand Total Required = $3,739,411

- Maintain Millage Rate and Growth in Property Digest / Taxes will Cover Increase
  - Maintain Millage Rate at 4.392
  - Estimated Property Tax Increase 7.22%
  - Includes primary major revenues sources – Property Taxes, LOST, and TAVT

  - For a $250,000[1] Home Value, Resident Annual Property Tax Increase:
    - General Fund $26.35/annual or $2.20/month
    - EMS portion $1.63/annual or $0.14/month

[1]Assumes a 6.0% increase in home value to $265,000

FY2020 BUDGETARY IMPACTS

QUESTIONS

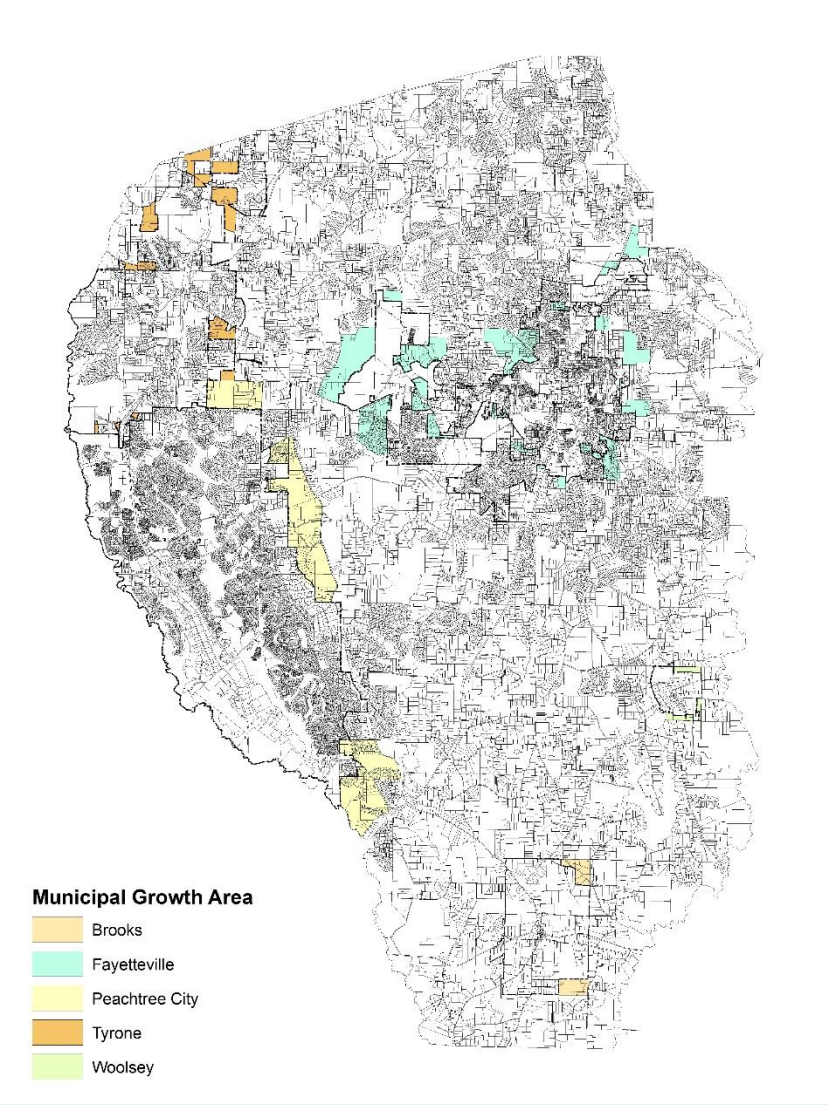
MUNICIPAL GROWTH AREAS

Annexation Goals

BOARD OF COMMISSIONERS RETREAT

APRIL 5, 2019

Municipal Growth Area Map



Coordinated Planning

- Create a coordinated vision for the County and municipalities in regard to municipal growth areas where annexation is probable.
- Sewer allows for greater density (residential) and intensity (non-residential) over an on-site septic system.

The question is – what increase in density and/or intensity will the Board of Commissioners accept?

Next Step - Goals

1. Develop a plan for elected officials (County and municipal) to mutually anticipate annexation and the resulting future development.

2. Develop an annexation procedure (IGA) that allows more time for the County and municipalities to evaluate and negotiate an annexation.

3. Establish Municipal Growth Areas where annexation is likely to occur and the proposed densities for these growth areas.

4. Evaluate the delivery of public services for annexations.

Past Annexations

Proposed acres per unit for past annexations – average acres/unit is 0.53 acres/unit
Proposed units per acre for past annexations – average units/acre is 2.1 units/acre

Jurisdiction	Gross Acreage	Lots	Acres/Unit	Units/Acre
Fayetteville	29.5	39	.76 acres/unit	1.3 units/acre
Fayetteville	175.5	370	.47 acres/unit	2.1 units/acre
Fayetteville	44.415	162	.27 acres/unit	3.6 units/acre
Fayetteville	101	123	.82 acres/unit	1.2 units/acre
Fayetteville	20.2	46	.44 acres/unit	2.3 units/acre
Peachtree City	48.81	94	.52 acres/unit	1.9 units/acre
Peachtree City	10.5	24	.43 acres/unit	2.3 units/acre

Residential Annexation

1. An increase of no more than 2.00 times the gross residential density as shown on the Fayette County Future Land Use Plan or the current zoning of the property. The cites have suggested that the residential density of the area within the municipality adjacent to the proposed annexation area be a factor considered in this process

2. Provide a buffer for a transitional area between residential development in the county and proposed residential development in the municipality.

3. Identify needed transportation improvements and determine funding for these improvements (city, county, GDOT and/or developer).

4. Evaluate public service delivery aspects.

5. In instances when a requested annexation's residential density exceeds the density limits set above, the County and municipality may negotiate the density and/or consider measures to mitigate the increase in density with greater buffers/setbacks, etc. If agreement cannot be reached the municipality could then proceed through the annexation process. The County may object to the annexation and go through the State arbitration procedure.

Non-Residential / Mixed-Use Annexation

1. County and municipality may negotiate acceptable uses, density, intensity, etc.

2. Provide a buffer for a transitional area between residential development in the county and proposed non-residential or mixed-use development in the municipality.

3. Identify needed transportation improvements and determine funding for these improvements (city, county, GDOT and/or developer).

4. Evaluate public service delivery aspects.

5. If agreement cannot be reached the municipality could then proceed through the annexation process. The county may object to the annexation and go through the State arbitration procedure.

MUNICIPAL GROWTH AREAS

Annexation Goals

QUESTIONS

Municipal Growth Area

- Brooks
- Fayetteville
- Peachtree City
- Tyrone
- Woolsey

COORDINATED PLANNING

DRAFT

The purpose of this effort is to create a coordinated vision for the county and municipalities in regard to municipal growth areas where annexation is probable. The provision of sewer allows for a greater density (residential) and/or intensity (nonresidential) of the development that can be achieved in the unincorporated county on an on-site septic system. It is assumed that annexation will result in an increase in development density and/or intensity when sewer is involved. **The question is, what increase in density and/or intensity will the Board of Commissioners accept?**

Based on State law, municipalities must notify a county when an annexation application has been accepted and the county elected officials have 30 days to vote to object to the annexation in a public meeting. The basis for objection is the annexation creates a material increase in burden (financial) upon the county. The material increase in burden must be related to the proposed change in zoning or land use, proposed increase in density, and infrastructure demands related to the proposed change in zoning or land use. Validity of an objection is evaluated based on a substantial change in the intensity of the allowable use of the property or a change to a significantly different allowable use; or a use which significantly increases the net cost of infrastructure or significantly diminishes the value or useful life of a capital outlay project which is furnished by the county to the area to be annexed, and differ substantially from the existing uses suggested for the property by the county's comprehensive land use or permitted for the property pursuant to the county's zoning ordinance or its land use ordinances.

When a County votes to object to an annexation, the case is considered by an arbitration panel established by the Department of Community Affairs. The arbitration panel will determine the validity of the grounds for objection. If the objection is determined to be valid, the panel may establish zoning, land use, or density conditions applicable to the annexation and propose any reasonable mitigating measures as to an objection pertaining to infrastructure demands. It is unlikely that an arbitration panel will stop an annexation from occurring.

The municipal or county governing authority or an applicant for annexation may appeal the decision of the arbitration panel by filing an action in the superior court of the county within ten calendar days from receipt of the panel's findings and recommendations. The sole grounds for appeal shall be to correct errors of fact or of law, the bias or misconduct of an arbitrator, or the panel's abuse of discretion.

Goals:

1. Develop a plan for elected officials (county and municipal) to mutually anticipate annexation and the resulting future development.
2. Develop an annexation procedure (IGA) that allows more time for the county and municipalities to evaluate and negotiate an annexation.
3. Establish Municipal Growth Areas where annexation is likely to occur and the proposed densities for these growth areas.
4. Evaluate the delivery of public services for annexations.

Residential Annexation:

The table below represents the proposed acres per unit and corresponding units per acre for past annexations.

Jurisdiction	Gross Acreage	Lots	Acres/Unit	Units/Acre
Fayetteville	29.5	39	.76 acres/unit	1.3 units/acre
Fayetteville	175.5	370	.47 acres/unit	2.1 units/acre
Fayetteville	44.415	162	.27 acres/unit	3.6 units/acre
Fayetteville	101	123	.82 acres/unit	1.2 units/acre
Fayetteville	20.2	46	.44 acres/unit	2.3 units/acre
Peachtree City	48.81	94	.52 acres/unit	1.9 units/acre
Peachtree City	10.5	24	.43 acres/unit	2.3 units/acre

The average acres per unit of these annexation requests is .53 acres per unit. The average units per acre of these annexation requests is 2.1 units per acre.

1. An increase of no more than two times the gross residential density as shown on the Fayette County Future Land Use Plan or the current zoning of the property, whichever density is greater. The cites have suggested that the residential density of the area within the municipality adjacent to the proposed annexation area be a factor considered in this process
2. Provide a buffer for a transitional area between residential development in the county and proposed residential development in the municipality.
3. Identify needed transportation improvements and determine funding for these improvements (city, county, GDOT and/or developer).
4. Evaluate public service delivery aspects.
5. In instances when a requested annexation's residential density exceeds the density limits set above, the County and municipality may negotiate the density and/or consider measures to mitigate the increase in density with greater buffers/setbacks, etc. If agreement cannot be reached the municipality could then proceed through the annexation process. The County may object to the annexation and go through the State arbitration procedure.

Non-Residential or Mixed-Use (Residential and Nonresidential) **Annexation:**

1. County and municipality may negotiate acceptable uses, density, intensity, etc.
2. Provide a buffer for a transitional area between residential development in the county and proposed non-residential or mixed-use development in the municipality.
3. Identify needed transportation improvements and determine funding for these improvements (city, county, GDOT and/or developer).
4. Evaluate public service delivery aspects.
5. If agreement cannot be reached the municipality could then proceed through the annexation process. The county may object to the annexation and go through the State arbitration procedure.

WATER SYSTEM

Meter Replacement Funding Options

BOARD OF COMMISSIONERS RETREAT

APRIL 5, 2019

Debt Service Coverage

- The bond covenants require a minimum of a 1.2 coverage ratio
- For comparison purposes, the chart below demonstrates historical coverage ratios:

Fiscal Year	Debt Service Coverage
FY2017	1.59
FY2018	1.33
FY2019 YTD through February	1.42

Meter Replacement Options

Option #1 – GEFA $10M / 10 Yr. Loan

- $10M / 10 Year Interest Rate = 0.79%
- Annual Payment = $1,043,963
  - Payments total $10,439,628
  - Interest total $439,628
- Option would replace all meters in year one

Assumptions	5% Increase in Revenue = $700k
Highest Debt Coverage Ratio – FY2020 through FY2025	1.37
Lowest Debt Coverage Ratio – FY2020 through FY2025	1.31

Meter Replacement Options

Option #2 – GEFA $10M / 10 Yr. Loan & Meter Replacement Fee

- $10M / 10 Year Interest Rate = 0.79%
- Annual Payment = $1,043,963 less $587,098 offset = Net $456,530 increase
  - Payments total $10,439,628
  - Interest total $439,628
- Option would replace all meters in year one
- Leak Protection Fee ($3) would be reallocated; Leak Protection ($1) and Meter Replacement Fee ($2) – No impact to existing residents in program
- Meter Replacement Fee ($2); $587,098, restricted to offset new loan payment

Assumptions	5% Increase in Revenue = $700k
Highest Debt Coverage Ratio – FY2020 through FY2025	1.37
Lowest Debt Coverage Ratio – FY2020 through FY2025	1.31

Meter Replacement Options

Option #3 – GEFA $10M / 15 Yr. Loan

- $10M / 15 Year Interest Rate = 1.25%
- Annual Payment = $735,265
  - Payments total $11,028,969
  - Interest total $1,028,969
- Option would replace all meters in year one

Assumptions	5% Increase in Revenue = $700k
Highest Debt Coverage Ratio – FY2020 through FY2025	1.43
Lowest Debt Coverage Ratio – FY2020 through FY2025	1.37

Meter Replacement Options

Option #4 – Pay As You Go

- $10M Project Cost
- Leak Protection Program Revenue = $680,646[1]
- Option would take 15 years to replace meters (FY2034)
- Meter replacements of approximately 1,950 meters annually (6.7%/per year)
- Leak Protection revenues restricted to fund pay-as-you-go program

Assumptions	5% Increase in Revenue = $700k
Highest Debt Coverage Ratio – FY2020 through FY2025	1.44
Lowest Debt Coverage Ratio – FY2020 through FY2025	1.38

[1] $680,646 net revenue includes = $880,646 revenue less leak protection expense of $200,000

Meter Replacement Options

Staff Recommendation

- Implement Option #2 - GEFA $10M / 10 Yr. Loan & Meter Replacement Fee
- Begin the process of preparing a $10M request for funding from (GEFA) Georgia Environmental Finance Authority under the 2018 Clean Water and Drinking Water State Revolving Funds
- Evaluate and determine the type of meter best fits the long-term strategy of the operations of the water system
- Solicit a Vendor to partner with the Water System for implementing the meter changeout program
- Develop and communicate the benefits of the program to our residents

WATER SYSTEM

Meter Replacement Funding Options

QUESTIONS

WATER SYSTEM INTERCONNECTIVITY

BOARD OF COMMISSIONERS RETREAT

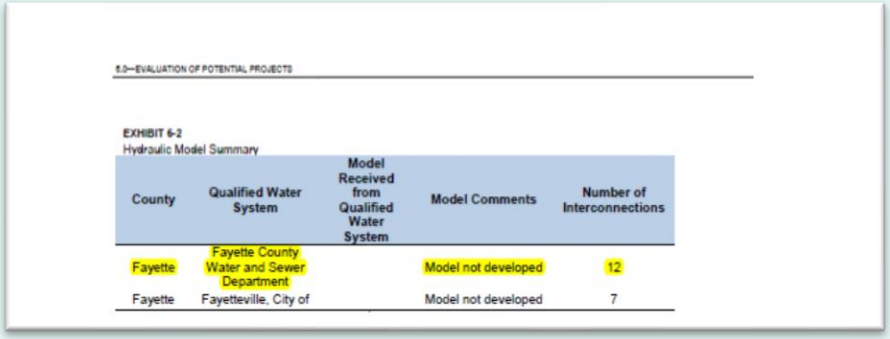
APRIL 5, 2019

Interconnectivity

Rationale

- Water System Interconnection, Redundancy and Reliability Act (WSIRRA) was signed into law in May 2010

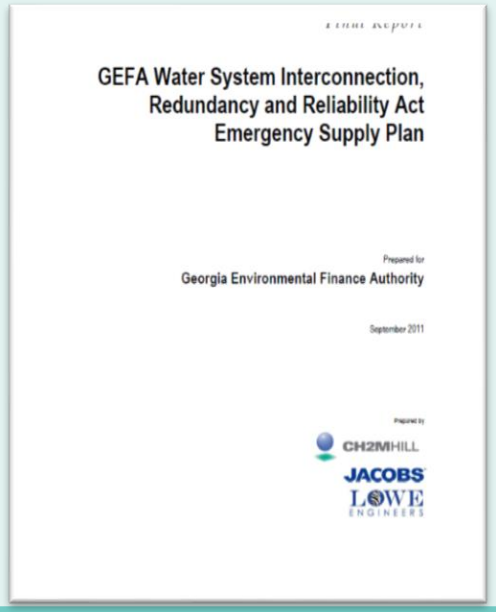
- This legislation directed the Georgia Environmental Finance Authority (GEFA) to complete an engineering study that develops an emergency water supply plan for all qualified water systems within the district.



6.0—EVALUATION OF POTENTIAL PROJECTS

EXHIBIT 6-2
Hydraulic Model Summary

County	Qualified Water System	Model Received from Qualified Water System	Model Comments	Number of Interconnections
Fayette	Fayette County Water and Sewer Department		Model not developed	12
Fayette	Fayetteville, City of		Model not developed	7



GEFA Water System Interconnection, Redundancy and Reliability Act Emergency Supply Plan

Prepared for
Georgia Environmental Finance Authority

September 2011

CH2MHILL
JACOBS
LOWE ENGINEERS

Interconnectivity

Requests

The preference is to comply on our terms rather than waiting for the legislation to force this connection. To determine whether interconnectivity is a viable option the following tasks would be conducted to arrive at a sound decision:

1. Hydraulic System Modeling / Mapping
2. Safe Yield Analysis
3. Long Term Water Supply / Demand Forecasting
4. Rate Study

Interconnectivity

Hydraulic System Modeling / Mapping

- Model the system's ability to meet demands and push water to neighboring areas with no impact to operations
- Modeling will include evaluating steady state (SS) and extended period (EP) simulations to analyze conditions, future system improvements, and potential interconnections with neighboring areas
- Geographic Information System (GIS) map of existing system and develop a GIS map of distribution network
- Create a map of waterlines using historical records and reporting from the FCWS

Interconnectivity

Safe Yield Analysis

- Update the current Safe Yield Analysis to ensure we have water available to meet system demands
- Includes an analysis of the reliable annual average quantity that can be withdrawn during a critical drought period for the region
- Identify excess water available to sell short term to improve our financial standing
- Evaluate downstream impacts of raw water withdrawal on each of the surface waters
- Evaluate drought impacts on the calculations of the Instream Flow Protection Threshold (IFPT) – the required minimum flow release below the dam of each reservoir

Interconnectivity

Long Term Water Supply / Demand Forecasting

- Project future water demands (50 year period) using each municipality's Land Use and Comprehensive Plans
- Study will include analysis of current wholesale water customers, as well as the current domestic and non-domestic water customers
- Study results will be compared to Safe Yield Analysis to determine if there is an adequate long term supply

Interconnectivity

Rate Study

- Conduct a rate study that would provide a wholesale water rate developed by a consultant
- Rate study would identify if rates are sufficient to meet the Water System's financial and service obligations, while maintaining sufficient reserves
- Phase I – Use results of the Safe Yield Analysis and the Long Term Water Supply / Demand Planning Study to develop a wholesale rate allowing for supply, production, and delivery capability
- Phase II – 18 months after Phase I, use results of the Hydraulic Water Model and 10 year Capital Plan and assess the methodology of the existing wholesale rate and potentially make recommendation for future rate changes.

WATER SYSTEM INTERCONNECTIVITY

QUESTIONS

Final Report

GEFA Water System Interconnection, Redundancy and Reliability Act Emergency Supply Plan

Prepared for

Georgia Environmental Finance Authority

September 2011

Prepared by

CH2MHILL

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Acknowledgements

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We also want to thank the project team members whose contributions were essential in developing this plan:

- Jacobs Engineering Group Inc.
- Lowe Engineers LLC
- River to Tap (R2T)
- Galardi Rothstein Group and
- Walker, Hulbert, Gray & Moore LLP

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Acronyms and Abbreviations

AAD	average annual daily
AWWA	American Water Works Association
BG	billion gallons
CIP	Capital Improvement Plan
CPES	CH2M Hill Parametric Cost Estimating System
fps	feet per second
EPD	Georgia Environmental Protection Division
GEFA	Georgia Environmental Finance Authority
IDSE	Initial Distribution System Evaluation
IRT	immediate reliability target
ISO	Insurance Services Office
LF	linear feet
LRRT	long-range reliability target
MG	million gallons
mgd	million gallons per day
N/A	not applicable
O.C.G.A.	Official Code of Georgia Annotated
PPP	public-private partnership
QWS	Qualified Water System
SDC	services during construction
WPZ	water pressure zone
WSIRRA	Water System Interconnection, Redundancy, and Reliability Act
WSWCMP	Water Supply and Water Conservation Management Plan
WTP	water treatment plant

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1.0 Introduction

The Water System Interconnection, Redundancy and Reliability Act (WSIRRA) was signed into law in May 2010. The legislation directed the Georgia Environmental Finance Authority (GEFA) to complete a thorough and detailed engineering study that develops an emergency water supply plan for all qualified water systems (QWSs) within the Metropolitan North Georgia Water Planning District (District).

For the purpose of this study, a QWS is defined as any public water system owned and operated by a city, county or water authority in the District that has current surface water withdrawal permit(s) or more than 20,000 retail connections/accounts. Thirty-three QWSs were identified within the District's 15 counties, as shown in Exhibit 1-1.

1.1 Statement of Purpose

The purpose of this study is to evaluate the drinking water withdrawal, treatment and distribution systems of the QWSs and to identify proactive measures that can be taken to reduce the risk of catastrophic interruptions of water service during emergencies.

Per the WSIRRA, emergency situations include:

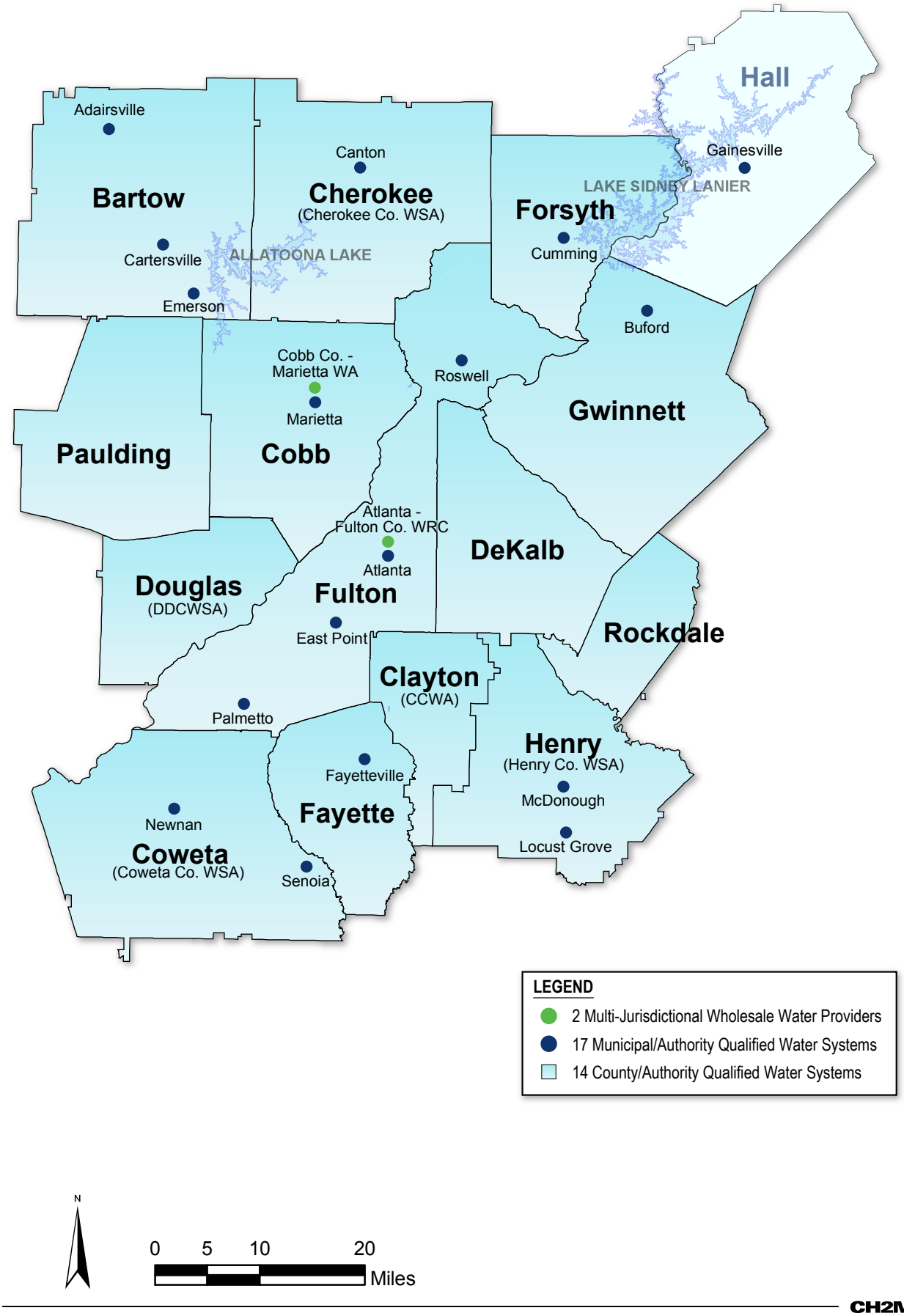
1. Failure of largest water treatment facility;
2. Short-term catastrophic failure of a water distribution system;
3. Short-term contamination of a raw water source;
4. Full unavailability of major raw water sources due to federal or state government actions; and
5. Limited or reduced availability of major raw water sources due to federal or state government actions.

During commission of this study additional emergency situations were also identified and evaluated:

6. Failure of existing dam of a raw water supply.
7. Water supply reduction due to drought.

The study is mandated to identify emergency water supply sources and detail the steps required to modify any QWS's operations to accept or share water with adjacent water providers within the District during emergencies in order to supply essential water needs (i.e., the minimum amount of water needed by residential and commercial users for food processing, drinking, toilet flushing, fire fighting, hospital use and critical asset use.)

EXHIBIT 1-1
Qualified System Location Map



This study involved evaluation of numerous factors affecting water system reliability, including raw and finished water storage, infrastructure and equipment redundancy, and existing interconnection capabilities. Potential vulnerabilities during emergencies were assessed, and projects to improve system reliability were identified and prioritized.

A methodical approach was developed at the onset of this study to take into account complexities of the study, i.e., the large number of QWSs involved, an aggressive schedule, and the multifaceted analysis needed to analyze the QWSs' infrastructure in order to determine their vulnerability to various emergency scenarios. This report documents the steps taken to complete the study and to develop a recommended emergency water supply plan.

1.2 Study Approach

The section headings in this report are organized to reflect the sequential work task structure and reflect the execution of the study scope. The objectives and methodologies of each task are as follows:

Section 2 QWS Data Collection

The data collection task involved developing a detailed questionnaire and data request list. It also included meeting with most of the QWSs (especially the larger systems) and obtaining all relevant data, maps, hydraulic models and accurate locations for QWS infrastructure. The capture of this information was important to the study because it formed the basis for assessing the planning benchmarks, supply risk and emergency readiness in subsequent tasks.

Section 3 Emergency Water Supply Sources

The emergency water supply sources task involved identifying water bodies capable of providing redundant water supply. This task was requested by GEFA; however, it was recognized that all available sources are currently in use. While the study identified additional sources, none have the infrastructure that would allow them to be used for emergency supply. This evaluation includes both raw and potable water sources, emergency water supplies secured through interconnections between systems, and intra-system access to reliable alternate water supplies, such as back-up wells or other raw or finished water sources.

Section 4 Emergency Planning Benchmarks

The development of planning benchmarks is dictated by the WSIRRA in order to evaluate risks and to set District-wide interconnection reliability targets. The enabling legislation dictates that this study should consider two District-wide interconnection reliability targets:

- 35 percent of the average annual daily (AAD) demand.
- 65 percent of the AAD demand.

These general targets provide preliminary benchmarks for emergency planning in the study. The current (i.e., year 2006) and long-range (i.e., year 2035) water demands were calculated for each QWS based on previously developed water demands. These targets were not intended to represent permanently achievable demand reductions.

Section 5 Water Supply Risk Evaluations

The water demands developed for each QWS as part of the Emergency Planning Benchmarks task were compared to the available water supply for each QWS. Emergency scenarios were identified, and the reliability targets were applied to each scenario to evaluate the capabilities of a QWS to respond to that emergency. Deficits of supply relative to demand under emergency conditions were then summarized in tables for use in subsequent tasks. The degree of readiness of each QWS to close deficits and to identify the maximum deficit (also known as the Critical Scenario Deficit) for the various emergency scenarios was also determined.

Section 6 Evaluation of Potential Projects

This task identified the most viable means of eliminating the critical scenario deficits in the subject QWSs. Modeling and/or other hydraulic evaluations were conducted to determine the hydraulic capacity of existing interconnections. The hydraulic capacity of existing interconnections was calculated to determine if the Critical Scenario Deficit could be reduced or eliminated. In the case of new interconnections, the critical scenarios were analyzed using additional computer modeling to identify capital improvements that would enable the transfer of water from neighboring utilities to the QWSs with deficits. Internal system redundancy alternatives were also included, where appropriate. Cost estimates were developed for the capital improvements, financial and legal options to fund the improvements were examined, and an approach was developed to prioritize and schedule the projects.

Section 7 Recommended Projects

After the projects were identified, evaluated and cost-estimated, the most appropriate and cost-effective projects were selected for each QWS with a deficit. These projects include upgrades to existing interconnections, new interconnections, and internal infrastructure redundancy projects. In addition, major water plant upgrade projects already planned for the QWSs were identified.

Section 8 Model Agreements and Summary of Innovative Financing Best Practices

The WSIRRA requires that policy, financing and new model agreements be studied in an effort to identify viable solutions to reliability or redundancy shortfalls. This study evaluated various financing options, including traditional financing approaches, such as state loans or municipal or commercial bonds, and non-traditional financing options, such as public-private-partnerships and asset transfer. In addition, a model intergovernmental agreement was developed for QWSs to use as a guide in creating emergency water sharing agreements.

1.3 Note about Detailed System Data

As mentioned above, the WSIRRA directed the completion of a “thorough and detailed engineering study that develops an emergency water supply plan” for all QWSs within the District. The following sections on methodology bear out the fact that the project team that completed this study fulfilled the mandate. This study rests on a firm foundation of detailed data collection, mapping, hydraulic modeling and economic analysis. But, at GEFA’s insistence, the project team has excluded any detailed data that may compromise the security of the QWSs. Detailed system data will be shared directly with each QWS, but will not be distributed publicly.

2.0 QWS Data Collection

A substantial data collection and analysis task was undertaken at the outset of this study to gather, compile and assess detailed information about each QWS. This information includes facility descriptions and maps, operating data, permits, water sales contracts and agreements, computer models, plans, forecasts, and other relevant reports and data products.

2.1 Data Collection Process

Each QWS was sent a standardized data request form approved by GEFA that included the following categories:

- System Description;
- Water Demands and Rates;
- Water Sources;
- Water Treatment Facilities;
- Distribution System Facilities; and
- Infrastructure and Emergency Planning Documents.

Meetings were held with most of the QWSs to assist them in their data gathering efforts. Thirty of the 33 QWSs provided complete or partially complete data forms. For QWSs that had data missing, state of Georgia and District resources were used to obtain missing information and to verify and supplement information provided directly by the QWSs. The key resources included:

- **Public Water System Operating Permits** – Permits issued by the Georgia Environmental Protection Division (EPD) for water system operation. The permits describe operating conditions and limitations and list the approved water sources for systems including water treatment plants (WTPs), groundwater sources and purchased water connections. Permitted WTP capacities are identified along with raw water sources associated with each plant, the number of filters, and the maximum filter loading rate.

- **Sanitary Surveys** – Surveys conducted by EPD to monitor treatment practices. These surveys are performed periodically for each water system and contain detailed descriptions of facilities.

- **Surface and Groundwater Withdrawal Permits** – Permits issued by EPD for withdrawals from raw water sources. The permits identify raw water sources and withdrawal limits.

- *Metropolitan North Georgia Water Planning District Water Metrics Report* **(February 2011)** – This report documents recent historical water supply and sales for each county in the District.

- *Water Supply and Water Conservation Management Plan* **(WSWCMP; May 2009)** – This District report provides a comprehensive county-by-county plan through 2035 for new water treatment capacity and major system interconnections.

2.2 Summary of Data Collected

Some highlights of the collected data are presented below.

2.2.1 General System Information, Infrastructure, and Supply

The data reveal that the 33 QWSs operate 38 WTPs. Overall, the QWSs have a combined treatment capacity of 1201 million gallons per day (mgd) and directly serve a total estimated current population of nearly 4.5 million people. Exhibit 2-1 shows basic general information about each QWS and the data collection efforts pertaining to it and identifies existing relationships between QWSs, such as regular purchases or sales of water. It should be noted that extensive interconnections are already in place.

Other findings of the data collection effort included:

- Nearly two-thirds of the QWSs have multiple raw water sources, pumps, reservoirs or reliable water purchase agreements. These systems serve more than 90 percent of the estimated total QWS-served population. The remaining systems lacking this level of redundancy serve less than 10 percent of the population.
- Seven QWSs have two or more WTPs at separate locations and serve nearly 50 percent of the District population.
- Of the QWSs' 38 WTPs, 15 have dual power feed or emergency generators.

Information about water sources and water treatment practices was collected to determine the potential compatibility for mixing treated waters from different systems (i.e., as a result of interconnections). Surface water sources within the District generally have very similar quality in terms of hardness, alkalinity and total organic carbon levels. Thus, similar treatment processes are employed by all the QWSs and produce similar finished water qualities. All of the QWSs use free chlorine to maintain distribution residual disinfection; none use chloramines for this purpose. Most QWSs maintain finished water pH in the range of 7.0 to 7.5 and use phosphate-based corrosion inhibitors for control of pipe corrosion. Notable exceptions are the Cobb County-Marietta Water Authority and DeKalb County, which raise pH to approximately 8.5 to 9.0 for the purpose of corrosion control and do not add a phosphate-based corrosion inhibitor.

EXHIBIT 2-1
Key Data for Qualified Water Systems

County	Qualified Water System	Estimated Population Directly Served (Rounded to Nearest 100)	Raw Water Source(s)	Made Regular Purchases During 2000-2009 From:	Made Regular Sales During 2000-2009 To:
Bartow	Adairsville, City of	3,600	Lewis Spring	None	Bartow County Water Department, Floyd County
Bartow	Bartow County Water Department	56,000	Bolivar Springs	Cities of Adairsville and Cartersville, Cherokee County Water and Sewerage Authority, Cobb County Water System, Polk County	Cities of Emerson and Kingston

EXHIBIT 2-1
Key Data for Qualified Water Systems

County	Qualified Water System	Estimated Population Directly Served (Rounded to Nearest 100)	Raw Water Source(s)	Made Regular Purchases During 2000-2009 From:	Made Regular Sales During 2000-2009 To:
Bartow	Cartersville, City of	24,800	Lake Allatoona, Etowah River	None	Bartow County Water Department
Bartow	Emerson, City of	1,400	Moss Springs	Bartow	None
Cherokee	Canton, City of	14,300	Etowah River	Cherokee County Water and Sewerage Authority, City of Waleska	City of Waleska
Cherokee	Cherokee County Water and Sewerage Authority	192,000	Etowah River	Cobb County-Marietta Water Authority, Pickens County	Bartow County Water Department, Pickens County, Forsyth County, Etowah Water and Sewer Authority, Cities of Ball Ground, Canton, Woodstock, Waleska, and Jasper.
Clayton	Clayton County Water Authority	260,100	Flint River, Little Cotton Indian Creek. Groundwater wells.	City of Atlanta, DeKalb County, Henry County	Henry County
Cobb	Cobb County Water System	533,000	Wholesale Purchase	Cobb County-Marietta Water Authority	Bartow County, Paulding County, DDCWSA
Cobb	Cobb County-Marietta Water Authority	0	Lake Allatoona, Chattahoochee River, Etowah River	None	Cobb County Water System, Marietta Power and Water, Paulding County Water System, Cherokee County Water and Sewerage Authority, DDCWSA, City of Austell, City of Powder Springs, City of Woodstock, City of Mountain Park, Lockheed.

EXHIBIT 2-1
Key Data for Qualified Water Systems

County	Qualified Water System	Estimated Population Directly Served (Rounded to Nearest 100)	Raw Water Source(s)	Made Regular Purchases During 2000-2009 From:	Made Regular Sales During 2000-2009 To:
Cobb	Marietta Power and Water	60,100	Wholesale Purchase	Cobb County-Marietta Water Authority	None
Coweta	Coweta County Water and Sewerage Authority	59,800	Cedar Creek/BT Brown Reservoir. Groundwater wells.	City of Newnan, City of Atlanta, City of Griffin	Cities of Senoia, Palmetto, Turin, and Grantville
Coweta	Newnan Utilities	34,000	Brown, Sandy, Line, White Oak Creeks	None	Coweta County Water and Sewerage Authority
Coweta	Senoia, City of	2,500	Hutchin's Lake Groundwater wells.	Coweta County Water and Sewerage Authority	None
DeKalb	DeKalb County	594,400	Chattahoochee River	Gwinnett County, City of Atlanta	Henry County Water and Sewerage Authority, Clayton County Water Authority, Rockdale Water Resources
Douglas	Douglasville-Douglas County Water and Sewer Authority	117,300	Dog River, Bear Creek	Cobb County-Marietta Water Authority, Cobb County Water System	City of Villa Rica, Carroll County
Fayette	Fayette County Water System	71,100	Flint River, Line and Whitewater Creeks. Lake Kedron, Peachtree, and McIntosh. Groundwater wells.	City of Atlanta	City of Fayetteville
Fayette	Fayetteville, City of	15,300	Whitewater Creek Groundwater wells	Fayette County Water System	None
Forsyth	Cumming, City of	38,600	Lake Lanier	None	Forsyth County

EXHIBIT 2-1
Key Data for Qualified Water Systems

County	Qualified Water System	Estimated Population Directly Served (Rounded to Nearest 100)	Raw Water Source(s)	Made Regular Purchases During 2000-2009 From:	Made Regular Sales During 2000-2009 To:
Forsyth	Forsyth County Water and Sewer Department	112,200	Lake Lanier	Fulton County Water System, City of Cumming	Etowah Water and Sewer Authority
Fulton	Atlanta, City of	650,000	Chattahoochee River	Atlanta-Fulton County Water Resources Commission	Fayette County Water System, Coweta County Water and Sewerage Authority, Clayton County
Fulton	Atlanta-Fulton County Water Resources Commission	0	Chattahoochee River	None	Fulton County Water System, City of Atlanta
Fulton	East Point, City of	39,600	Sweetwater Creek	None	City of College Park
Fulton	Fulton County Water System	172,500	Wholesale Purchase	Atlanta-Fulton County Water Resources Commission	City of Roswell, Forsyth County
Fulton	Palmetto, City of	4,000	Cedar Creek	Coweta County Water and Sewerage Authority	None
Fulton	Roswell, City of	14,300	Big Creek	Fulton County Water System	None
Gwinnett	Buford, City of	8,000	Lake Lanier	Gwinnett County	None
Gwinnett	Gwinnett County Department of Water Resources	743,800	Lake Lanier	None	Cities of Gainesville, Loganville, Lawrenceville, Norcross, Braselton, Auburn, and Suwanee. Rockdale Water Resources, Walton County
Hall	Gainesville, City of	176,000	Lake Lanier, North Oconee River, Cedar Creek.	Gwinnett County, White County	Cities of Flowery Branch and Lula, Jackson County

EXHIBIT 2-1
Key Data for Qualified Water Systems

County	Qualified Water System	Estimated Population Directly Served (Rounded to Nearest 100)	Raw Water Source(s)	Made Regular Purchases During 2000-2009 From:	Made Regular Sales During 2000-2009 To:
Henry	Henry County Water and Sewerage Authority	184,000	Towaliga River, Indian Creek, Long Branch, Tussahaw Reservoir	DeKalb County, Clayton County Water Authority	Cities of Stockbridge, Locust Grove, McDonough, and Hampton
Henry	Locust Grove, City of	1,100	Brown Branch (Spring), Groundwater wells	Henry County Water and Sewerage Authority	None
Henry	McDonough, City of	10,200	Walnut Creek Reservoir. Groundwater wells.	Henry County Water and Sewerage Authority	None
Paulding	Paulding County Water System	107,500	Wholesale Purchase	Cobb County-Marietta Water Authority	Cities of Dallas and Hiram, Polk County
Rockdale	Rockdale Water Resources	67,500	Big Haynes Creek	Gwinnett County, Newton County	None

2.2.2 Mapping

Mapping data was collected from the QWSs in various formats, including hard copies, digital mapping data primarily in the form of GIS, and digital mapping data extracted during this study from QWS-supplied hydraulic computer models.

Exhibit 2-2 summarizes the type of mapping data (if any) provided by each QWS. Most of the systems provided hydraulic computer models, many of which contained pertinent mapping data that were extracted and used to create maps. A handful of systems provided both computer models and digital mapping data. In these cases, both types of data were generally of equal usefulness and quality.

EXHIBIT 2-2
Mapping Data Received from Qualified Water Systems

County	Qualified Water System	Estimated Current Population Directly Served[1]	Level of Mapping Data Received			
			No Mapping Data	Hard Copy Maps	Digital Mapping Data (GIS)	Hydraulic Computer Model
Bartow	Adairsville, City of	3,600		√		
Bartow	Bartow County Water Department	56,000			√	
Bartow	Cartersville, City of	24,800			√	

EXHIBIT 2-2
Mapping Data Received from Qualified Water Systems

County	Qualified Water System	Estimated Current Population Directly Served[1]	Level of Mapping Data Received			
			No Mapping Data	Hard Copy Maps	Digital Mapping Data (GIS)	Hydraulic Computer Model
Bartow	Emerson, City of	1,400	√			
Cherokee	Canton, City of	14,300				√
Cherokee	Cherokee County Water and Sewerage Authority	192,000				√
Clayton	Clayton County Water Authority	260,100			√	√
Cobb	Cobb County Water System	533,000				√
Cobb	Cobb County-Marietta Water Authority	0[2]				√
Cobb	Marietta Power and Water	60,100				√
Coweta	Coweta County Water and Sewerage Authority	59,800				√
Coweta	Newnan Utilities	34,000				√
Coweta	Senoia, City of	2,500	√			
DeKalb	DeKalb County	594,400			√	
Douglas	Douglasville-Douglas County Water and Sewer Authority	117,300			√	√
Fayette	Fayette County Water System	71,100		√		
Fayette	Fayetteville, City of	15,300			√	
Forsyth	Cumming, City of	38,600			√	√
Forsyth	Forsyth County Water and Sewer Department	112,200			√	√
Fulton	Atlanta, City of	650,000			√	√
Fulton	Atlanta-Fulton County Water Resources Commission	0[2]		√		
Fulton	East Point, City of	39,600	√			
Fulton	Fulton County Water System	172,500				√
Fulton	Palmetto, City of	4,000	√			
Fulton	Roswell, City of	14,300				√
Gwinnett	Buford, City of	8,000	√			
Gwinnett	Gwinnett County	743,800			√	√
Hall	Gainesville, City of	176,000				√
Henry	Henry County Water and Sewerage Authority	184,000			√	√
Henry	Locust Grove, City of	1,100	√			
Henry	McDonough, City of	10,200	√			
Paulding	Paulding County Water System	107,500			√	√
Rockdale	Rockdale Water Resources	67,500				√

Notes:
1-Populations rounded to nearest 100.
2-Populations are included in the population of their wholesale customers

Overall, electronic mapping data was provided by 23 of the QWSs, representing 97 percent of the QWS-served population. Including the hydraulic model developed for DeKalb County, hydraulic models were ultimately available for 18 of the 33 systems.

The GIS data for each QWS was edited and combined to create GIS files that include municipal boundaries, pipes, pipe sizes, water pressure zones (WPZs), WTPs, storage tanks, interconnections, and interconnection sizes for the QWSs. In numerous cases pipes and interconnections were duplicated from overlapping mapping data. The duplicates were removed from the database by visually comparing all of the neighboring QWSs. Additionally the overall database was edited to remove interconnections with non-qualified systems. This data was then used to create 10 large (1:48,000 scale) maps showing the data described above, county boundaries, major roadways, and water features.

2.2.3 Emergency Planning Data

Data and reports related to emergency planning were requested from the QWSs. The specific types of reports collected included:

- System Master Plan/Capital Improvement Plan (CIP).
- Initial Distribution System Evaluation (IDSE) prepared for the Stage 2 Disinfectants and Disinfection Byproducts Rule.
- Insurance Services Office (ISO) Reports / Fire Flow Test Reports (Fire Department or ISO Reports).
- Reports or information related to status of the implementation of action item 9.2 in the District's WSWCMP, which calls on District utilities to "develop or update local emergency water plans."
- Emergency Response Plans.
- Conservation/Drought Plans.
- Purchase Agreements.

Exhibit 2-3 summarizes the documents received as part of this effort.

EXHIBIT 2-3
Summary of Emergency Planning Reports and Documents Received

County	Qualified Water System	Emergency Planning Reports and Documents Received						
		CIP or Master Plans	IDSE Report	ISO Reports or Fire Flow Test Reports	Status of District Audit Action Item 9.2	Emergency Response Plan	Conservation/ Drought Plan	Purchase Agreements
Bartow	Adairsville, City of	√					√	
Bartow	Bartow County Water Department				√	√	√	√
Bartow	Cartersville, City of		√	√	√	√	√	
Bartow	Emerson, City of						√	
Cherokee	Canton, City of							
Cherokee	Cherokee County Water and Sewerage Authority	√	√		√		√	√
Clayton	Clayton County Water Authority	√	√		√	√	√	√
Cobb	Cobb County Water System	√		√		√		
Cobb	Cobb County-Marietta Water Authority	√					√	
Cobb	Marietta Power and Water	√		√	√	√	√	
Coweta	Coweta County Water and Sewerage Authority							
Coweta	Newnan Utilities							
Coweta	Senoia, City of							
DeKalb	DeKalb County	√						
Douglas	Douglasville-Douglas County Water and Sewer Authority	√			√	√	√	√
Fayette	Fayette County Water System	√		√	√	√		√
Fayette	Fayetteville, City of			√		√		√
Forsyth	Cumming, City of	√	√	√	√			√
Forsyth	Forsyth County Water and Sewer Department	√	√		√	√	√	
Fulton	Atlanta, City of	√				√	√	√
Fulton	Atlanta-Fulton County Water Resources Commission					√		
Fulton	East Point, City of	√				√	√	√
Fulton	Fulton County Water System	√		√				

EXHIBIT 2-3
Summary of Emergency Planning Reports and Documents Received

County	Qualified Water System	Emergency Planning Reports and Documents Received						
		CIP or Master Plans	IDSE Report	ISO Reports or Fire Flow Test Reports	Status of District Audit Action Item 9.2	Emergency Response Plan	Conservation/ Drought Plan	Purchase Agreements
Fulton	Palmetto, City of							
Fulton	Roswell, City of			√				
Gwinnett	Buford, City of							
Gwinnett	Gwinnett County	√	√			√		
Hall	Gainesville, City of	√						√
Henry	Henry County Water and Sewerage Authority			√			√	√
Henry	Locust Grove, City of							
Henry	McDonough, City of					√	√	√
Paulding	Paulding County Water System	√	√	√				
Rockdale	Rockdale Water Resources		√	√			√	

3.0 Emergency Water Supply Sources

This section evaluates sources of emergency water supply capable of providing redundant water supply to ensure that the water supplies needed to respond to the potential emergencies are available either from a neighboring QWS or through a new source.

Various water supply sources were assessed, and the study focused on four primary areas:

- Excess capacity from existing surface water sources;
- Potential water sources and storage options;
- Return flows as potential emergency water supply; and
- Factors affecting availability of water supply.

The sections below provide a summary of this evaluation.

3.1 Excess Capacity from Existing Surface Water Sources

Emergency supplies for the District could be provided using excess capacity from existing water sources. Two types of possible excess capacity were examined. Current and future (i.e., 2006 and 2035) uses of existing water sources by QWSs were initially assessed to determine if excess water is available from a given system to assist with short-term defined duration emergencies such as a power outage or equipment failure.

This evaluation calculated the difference between a QWS's annual average daily demand and peak day treatment to determine the maximum amount of water that could be shared during a short-term defined duration emergency. This evaluation assumed that a QWS could increase to full peak day production in order to provide the excess water to the QWS experiencing the emergency (peak capacity – annual average demand = maximum amount of available water that could be shared). It is important to note that a given community's' local needs at the time of the emergency could be higher than their annual average demand, resulting in less "excess capacity" being available. As outlined in Exhibit 3-1, this evaluation demonstrates that there is sufficient excess capacity from existing sources to meet the short-term defined duration emergency scenarios identified in previous sections.

Current and future (i.e., 2006 and 2035) uses of existing water sources by QWSs were also assessed to determine if excess water is available from a given system to assist with long-term undefined duration emergencies, such as "full unavailability" or "limited or reduced availability" of major raw water sources due to federal or state government actions. Due to the long-term nature of this scenario, this evaluation compared the difference between a QWS's average daily water use and average daily treatment capacity.

As outlined in Exhibit 3-2, the amount of excess capacity from existing sources using this calculation is relatively small, and the emergency response for these long-term undefined duration scenarios will require additional water sources beyond existing surface water sources within the District. As will be explained in section 5.1, these scenarios were evaluated, but the work was discontinued in the wake of the recent court case. Further study is needed.

EXHIBIT 3-1
Current and Future Excess Capacity

County	Qualified Water System	Water Treatment Plant	2010 Plant Capacity (Peak Day-mgd)	2006 Demand[1] (AAD-mgd)	2006 Excess Capacity (mgd)	2035 Plant Capacity[2] (Peak Day-mgd)	2035 Demand (AAD-mgd)	2035 Excess Capacity (mgd)
Bartow	Adairsville, City of	Adairsville WTP	4.00	2.60	1.4	6.0	3.6	2.4
Bartow	Bartow County Water Department	Bartow County WTP	0.8	0.7	0.1	30.8	18.3	12.5
Bartow	Cartersville, City of	Cartersville WTP	27.0	13.9	13.1	40	23.8	16.2
Bartow	Emerson, City of	Emerson WTP	0.5	0.2	0.3	0.5	0.3	0.2
Cherokee	Canton, City of	Canton WTP	5.5	2.7	2.8	18.0	11.4	6.6
Cherokee	Cherokee County Water and Sewerage Authority	CCWSA Etowah River WTP	38.0	15.8	22.2	53.0	33.6	19.4
Clayton	Clayton County Water Authority	Clayton Hicks WTP Clayton Smith WTP Clayton Hooper WTP	42.0	29.7	12.3	79.0	40.0	39.0
Cobb	Cobb County-Marietta Water Authority,	CCMWA Hugh A. Wyckoff WTP CCMWA James E. Quarles WTP	158.0	98.2	59.8	248.0	143.0	105.0
	Cobb County Water System	-	na			na		
	Marietta Power and Water	-	na			na		
Coweta	Coweta County Water and Sewerage Authority	B.T. Brown WTP	7.7	2.7	5.0	10.0	16.2	-6.2
Coweta	Newnan Utilities	Newnan-Hershall Norred WTP	14.0	7.0	7.0	21.0	12.4	8.6
Coweta	Senoia, City of	Senoia WTP	0.5	0.3	0.2	0.6	0.4	0.2
DeKalb	DeKalb County	Scott Candler WTP	150.0	82.8	67.2	175.0	106.0	69.0
Douglas	DDCWSA	Bear Creek WTP	23.0	13.2	9.8	23.0	22.1	0.9
Fayette	Fayette County Water System	Crosstown WTP South Fayette WTP	13.5 9.2	9.5	13.2	35.0	20.6	14.4
Fayette	Fayetteville, City of	Fayetteville WTP	3.0	1.6	1.4	4.0	2.4	1.6
Forsyth	Cumming, City of	Cumming WTP	24.0	11.9	12.1	36.0	20.8	15.2
Forsyth	Forsyth County Water and Sewer Department	Forsyth County WTP	30.7	6.8	23.9	68.0	39.2	28.8
Fulton	Atlanta, City of	Hemphill WTP Chattahoochee WTP	136.5 64.9	102.5	143.9	136.5 64.9	154.8	124.1

EXHIBIT 3-1
Current and Future Excess Capacity

County	Qualified Water System	Water Treatment Plant	2010 Plant Capacity (Peak Day-mgd)	2006 Demand[1] (AAD-mgd)	2006 Excess Capacity (mgd)	2035 Plant Capacity[2] (Peak Day-mgd)	2035 Demand (AAD-mgd)	2035 Excess Capacity (mgd)
		Atlanta-Fulton County WTP	45.0			77.5		
Fulton	Atlanta-Fulton County Water Resources Commission	-	N/A			N/A		
Fulton	East Point, City of	East Point WTP	13.9	9.7	4.2	13.9	10.0	3.9
Fulton	Fulton County Water System	Atlanta-Fulton County WTP	45.0	28.4	16.6	112.5	54.1	58.4
		Etowah WTP	0.0					
		Bear Creek WTP	0.0					
Fulton	Palmetto, City of	Palmetto WTP	0.6	0.4	0.2	0.6	3.1	-2.5
Fulton	Roswell, City of	Roswell WTP	3.0	1.2	1.8	5.0	3.6	1.4
Gwinnett	Buford, City of	Buford WTP	4.8	1.5	3.3	4.8	2.9	1.9
Gwinnett	Gwinnett County	Shoal Creek WTP	75.0	92.6	-17.6	75	48.0	27
		Lanier WTP	150.0		150.0	150	48.0	102
Hall	Gainesville, City of	Gainesville Riverside WTP	35.0	19.0	16.0	25.0	52.0	31.0
		Gainesville Lakeside WTP				46.0		
		Cedar Creek	0.0	0.0	0.0	12.0		
Henry	Henry County Water and Sewerage Authority	Tussahaw WTP	26.0	15.9	34.1	81.0	41.2	39.8
		Towaliga River WTP	24.0					
Henry	Locust Grove, City of		0.5	0.2	0.3	0.5	0.2	0.3
Henry	McDonough, City of	McDonough WTP	2.4	0.5	1.9	3.1	0.6	2.5
Paulding	Paulding County Water System		N/A			40		
Rockdale	Rockdale Water Resources	Big Haynes Creek WTP	22.1	11.4	10.7	27.1	17.0	10.1
Total					**616**			**781**

(1) 2006 Demand excludes purchased water
(2) 2035 Plant Capacity figures reflect current capacity plus planned upgrades as reflected in the District's WSWCMP

EXHIBIT 3-2
Excess Capacity Summary

County	2011 - 2015 Plant Capacity (Peak Day-mgd)	2011 - 2015 Demand (Peak Day-mgd)	Excess (Peak Day-mgd)	2035 Plant Capacity (Peak Day-mgd)	2035 Demand (Peak Day-mgd)	Excess (Peak Day-mgd)
Clayton County	65.0	54.0	11.0	79.0	64.0	15.0
Cobb County	194.0	192.0	2.0	248.0	228.0	20.0
Fulton County	360.9	311.0	49.9	410.9	375.0	35.9
Henry County	53.6	39.0	14.6	84.6	69.0	15.6
Total			**77.5**			**86.5**

3.2 Potential Water Sources and Storage Options

Potential additional water sources including surface waters, surface water impoundments and groundwater sources were identified as sources that could be developed to assist with emergency response. A preliminary analysis was performed to identify existing quarries that could potentially store raw water for future use by the QWSs. This evaluation was requested by GEFA and is required to identify potential water sources and storage options, but it is recognized that none of them are currently available for emergency supply.

- **Reservoirs Identified in the District's WSWCMP -** The WSWCMP identifies three new water supply reservoirs that are in various stages of the permitting process and three additional reservoirs that have not initiated the permitting process, but may be needed within the planning horizon. The total yield from these sources is 108 mgd. For the purposes of this study it has been assumed that the Cedar Creek Reservoir with a yield of 9 mgd is already available for the City of Gainesville. Consequently, the additional water supply that would be available from the sources mentioned above is 99 mgd.

- **Georgia Soil and Water Conservation Commission Flood Control Dams -** The Georgia Soil and Water Conservation Commission in partnership with the Natural Resource Conservation Service and EPD performed an assessment to determine existing structures that could be modified to serve as dams for water supply reservoirs. More than 350 dams were assessed and prioritized as to water supply potential based on various engineering and environmental criteria. The results indicated that five flood control dams located within the District could potentially be modified to serve as dams for water supply reservoirs with a total estimated potential additional yield of 49 mgd.

- **Georgia Inventory and Survey of Feasible Sites for Water Supply Reservoirs** – In 2008 GEFA engaged a consulting team led by MACTEC Engineering and Consulting, Inc. (MACTEC) to inventory and survey existing public-water-supply reservoirs for their expansion potential. This study was based on the feasibility of increasing dam heights to provide more storage volume and performing supplemental pumping from nearby streams for reservoir filling. The results are reported in *Georgia Inventory and Survey of Feasible Sites for Water Supply Reservoirs* (October 31, 2008). Three existing reservoirs within the District have expansion potential. Together the expanded reservoirs could potentially provide 13.8 billion gallons (BG) of additional water supply storage. The study did not include detailed calculations of yield for these potential reservoirs and is not comparable with other sources in this report.

- **Quarries** – Rock quarries and surface mines, once abandoned, have little value for land development and could provide potential sites for water supply storage during emergencies or drought. Design considerations include the stability of the quarry walls, groundwater seepage, and proximity to raw water sources and water

treatment facilities. For this study a list of possible quarries was developed based on GIS mapping of 2009 land use data provided by the Atlanta Regional Commission.

The sizes and depths of 22 potential quarries that could be used for water storage were estimated using GIS and topographic maps. From this estimate, over 100 billion gallons of water storage is available that theoretically could provide water for several months. However, it is unreasonable to think that each of these quarries would be converted to water storage as most are still active quarry sites. In addition, the water stored is finite as there is little inflow to each quarry except by groundwater flow. Finally, the cost to develop a quarry into a water storage reservoir is very expensive. For example, the City of Atlanta has estimated it will cost $180 million to develop the 2.4 billion gallon Bellwood quarry located in the City of Atlanta.

- **Groundwater** – Groundwater is not a principal source of public water supply within the District due to the low yields available from the area's aquifers. The District's *Water Metrics Report* (February 2011) notes that less than 1 percent of the water supply within the District is from groundwater. QWSs within the District could pursue additional water supply from groundwater for emergency use. While groundwater can provide some relief as an alternate water supply for QWSs with relatively small demands, this source is not viable on a larger scale for meeting demands across the District during times of emergency.

3.3 Return Flows as Potential Emergency Water Supply

Several municipalities within the District use indirect potable reuse to supplement existing water supply sources as part of a sustainable water supply system. In the planned return flow systems, treated water is pumped to a reservoir or lake for mixing with raw water to provide water supply.

The District's WSWCMP indicates Lake Lanier receives return flows from several municipalities, including the cities of Gainesville and Flowery Branch and Gwinnett County. The Cobb County-Marietta Water Authority and the Cherokee County Water and Sewerage Authority return flows to Lake Allatoona.

The Clayton County Water Authority uses indirect potable reuse to supplement several water supply reservoirs. Once wastewater is treated, it is pumped to constructed wetlands where it is filtered naturally and returned to water supply reservoirs. This approach to sustainable water management allowed Clayton County reservoirs to remain near 80percent capacity during Georgia's drought in 2007.

These return flows contribute to the development of a sustainable water supply, and both the state and federal governments should evaluate the feasibility of a credit for return flows into hydropower reservoirs and water supply rivers.

3.4 Factors Affecting Availability of Water Supply

The feasibility of using the potential emergency water supplies described above depends on several factors including conveyance limits to WTPs, EPD permitting restrictions, and water quality.

3.4.1 Conveyance Factors

Conveyance feasibility is a major consideration when assessing the practicality of using presently unused water sources to supply emergency water to the QWSs. Conveyance from new water sources would require construction of new pumping and piping infrastructure. The associated costs and permitting issues are key concerns and would depend heavily on the proximity of the water source(s) to the QWS(s) to be supplied. In addition, the choices for conveyance routes would be limited by natural topographical features and the presence of existing development and infrastructure, such as highways, railroads and residential housing, within the heavily developed District. These limitations could complicate conveyance layout and increase construction

costs. Detailed cost estimates would need to be performed to adequately assess the feasibility of conveying water from the potential water sources described earlier to the QWSs.

3.4.2 Water Withdrawal Permitting Factors

Another requirement associated with using presently unused water sources is permitting. Water withdrawal is regulated by EPD, which has an established permitting system and associated requirements. There are a variety of issues that may affect the time required to permit new sources. These include: development of a water conservation plan and drought contingency plan, District audit requirements, and the 391-3-16-01 Criteria for Water Supply Watersheds.

3.4.3 Finished Water Quality

The majority of current and prospective emergency water supply sources within the District are surface water supplies; thus, the treatment technologies to produce potable water are similar. The chemical and physical characteristics of the potable water within the various QWSs are similar; however, several QWSs treat their water differently, which creates the potential for water quality issues if waters from two systems are mixed. For example, blending water between Cobb County-Marietta Water Authority and systems on its border could cause noticeable precipitation of opaque, black or gray particles. If such an episode occurs, it would only pose an aesthetic problem for customers, but not a health risk. The precipitation is likely a result of one source using high pH for corrosion control and the other source using neutral pH and corrosion control inhibitors to protect against pipe corrosion. Another source of precipitation occurs when water flow is reversed, which results in particles that have settled in pipes being re-suspended or scale being pulled from the pipe as water flow is reversed when an interconnection is opened.

3.4.4 Source Water Quality

To ensure the water quality of any new reservoir is protected, EPD may require collection of monthly or quarterly water quality monitoring data. Water quality may be monitored at various depths to identify the practical volume that can be used for the water supply. Factors that may contribute to water quality include land use within the water supply basin, and potential pollutant sources within the water supply basin. A source water assessment plan may be required for developing a new water supply source as well. The WTP targeted to receive emergency supply water may be evaluated to ensure the treatment process can handle the particular characteristics of the new supply.

4.0 Emergency Planning Benchmarks

The WSIRRA dictates that the emergency plan developed as part of this study should "evaluate risks and, where feasible, plan for a district-wide interconnection reliability target for immediate implementation of approximately 35 percent of the annual average daily demand and long-range district-wide interconnection reliability planning goal of approximately 65 percent of the annual average daily demand." These general targets provided preliminary benchmarks for emergency planning in the study and the current (i.e., year 2006) and long-range (i.e., year 2035) water demands that were calculated for each QWS.

Year 2035 was selected as the future planning horizon as specified in the act; Year 2006 was selected to reflect current usage, because historical data were readily available for that year and are comparable to the current demand data utilized in the District's WSWCMP. The emergency planning benchmarks (35 percent and 65 percent of annual average demands) represent a reduced usage pattern that could be achieved during short (3-12 months) emergencies while still meeting emergency water needs, such as eating, drinking, toilet flushing, fire fighting and hospital use. These targets were not intended to represent permanently achievable demand reductions.

4.1 Methodology for Calculating Demands

The QWSs' 2006 and 2035 demands were calculated using AAD values in units of mgd.

4.1.1 Current (2006) Water Demands

The 2006 Water Demands were computed using the following formula:

> 2006 Total Demand = 2006 Withdrawal + 2006 Purchased Water (outside of the county) + 2006 Purchased Water (within the county)

The District's *Water Metrics Report* (February 2011) provides values for 2006 withdrawals and the amounts of water purchased from outside of the county. The amounts of water purchased from QWSs within the county were obtained from multiple sources, including QWS data collection sheets, QWS personnel, and EPD data.

It should be noted that demand is counted for both internal customers and external customers (i.e., other QWSs to which water is sold). For example, Cherokee County withdrew 15.8 mgd in 2006 to meet the demands of its customers. Of that amount, 0.7 mgd was provided to the city of Canton QWS. The 0.7 mgd is also shown for the city of Canton QWS as a "2006 Purchased Within County" value. While the 0.7 mgd is included in both the Cherokee County and city of Canton demands, this is appropriate in that each system requires that amount of water to satisfy all of its customer demand.

Exhibit 4-1 lists the demand components and total demand calculated for each QWS for 2006.

EXHIBIT 4-1
2006 Water Demands

County	Qualified Water System	2006 Withdrawal (AAD-mgd)	2006 Purchased Outside County (AAD-mgd)	2006 Purchased Within County (AAD-mgd)	2006 Total Demand (AAD-mgd)
Bartow	Adairsville, City of	2.6	0.0	0.0	**2.6**
Bartow	Bartow County	0.7	0.4	5.8	**6.9**
Bartow	Cartersville, City of	13.9	0.0	0.0	**13.9**
Bartow	Emerson, City of	0.2	0.0	0.1	**0.3**
Cherokee	Canton, City of	2.7	0.0	0.7	**3.4**
Cherokee	Cherokee County Water and Sewerage Authority	15.8	0.8	0.0	**16.6**
Clayton	Clayton County Water Authority	29.7	0.0	0.0	**29.7**
Cobb	Cobb County-Marietta Water Authority	98.2	0.0	0.0	**98.2**[(1)]
Cobb	Cobb County Water System	0.0	0.0	66.3	**66.3**[(1)]
Cobb	Marietta Power and Water	0.0	0.0	10.2	**10.2**[(1)]
Coweta	Coweta County Water and Sewerage Authority	0.0	2.7	3.7	**6.4**
Coweta	Newnan Utilities	7.0	0.0	0.0	**7.0**
Coweta	Senoia, City of	0.3	0.0	0.0	**0.3**
DeKalb	DeKalb County	82.8	0.0	0.0	**82.8**
Douglas	Douglasville-Douglas County Water and Sewer Authority	13.2	0.2	0.0	**13.4**
Fayette	Fayette County Water System	9.5	0.0	0.0	**9.5**
Fayette	Fayetteville, City of	1.6	0.0	0.3	**1.9**
Forsyth	Cumming, City of	11.9	0.0	0.0	**11.9**
Forsyth	Forsyth County Water and Sewer Department	6.8	0.6	4.5	**11.9**
Fulton	Atlanta, City of	102.5	0.0	14.2	**116.7**[(2)]
Fulton	Atlanta-Fulton County Water Resources Commission	42.6	0.0	0.0	**42.6**[(2)]
Fulton	East Point, City of	9.7	0.0	0.0	**9.7**
Fulton	Fulton County Water System	0.0	0.0	28.4	**28.4**[(2)]
Fulton	Palmetto, City of	0.4	0.0	0.0	**0.5**
Fulton	Roswell, City of	1.2	0.0	2.4	**3.6**
Gwinnett	Buford, City of	1.5	0.0	0.0	**1.5**
Gwinnett	Gwinnett County	92.6	0.0	0.0	**92.6**
Hall	Gainesville, City of	19.0	0.1	0.0	**19.1**
Henry	Henry County Water and Sewerage Authority	15.9	0.5	0.0	**16.4**
Henry	Locust Grove, City of	0.3	0.0	0.2	**0.5**

EXHIBIT 4-1
2006 Water Demands

County	Qualified Water System	2006 Withdrawal (AAD-mgd)	2006 Purchased Outside County (AAD-mgd)	2006 Purchased Within County (AAD-mgd)	2006 Total Demand (AAD-mgd)
Henry	McDonough, City of	1.3	0.0	0.1	**1.4**
Paulding	Paulding County Water System	0.0	10.9	0.0	**10.9**(1)
Rockdale	Rockdale Water Resources	11.4	0.0	0.0	**11.4**

(1) Demands listed for Cobb County Water System, Marietta Power and Water, and Paulding County Water System are a subset of the demand listed for Cobb County-Marietta Water Authority
(2) Demands listed for Fulton County Water System and a portion of the City of Atlanta's demand is a subset of the demand listed for the Atlanta-Fulton County Water Resources Commission.

The calculated 2006 total demand values were verified through comparison with other QWS-provided information, data from EPD Water Use Reduction Forms, and hydraulic modeling data. The calculated demand values compared well with the information from these sources.

4.1.2 Projected (2035) Water Demands

The District's WSWCMP (May 2009) projects total water demands on a county-by-county basis for 2035. Although it does not provide individual QWS demands, it does list projected peak plant capacities for each QWS for 2035. These projected capacities for WTPs for each QWS were used to develop a percentage demand for each QWS. These percentages were then used to disaggregate total county demand to the individual QWSs. In most cases this method provided appropriate values for the individual QWS demands for 2035. However, for three of the smaller QWSs this method resulted in 2035 demands that were less than 2006 demands. In these cases, the 2006 demand was used for the 2035 demand. Additionally, some adjustments were made for the QWSs in Cobb and Fulton Counties to account for the large wholesale suppliers that provide a significant amount of water in these counties.

Exhibit 4-2 provides an example of how these demands were calculated for Cherokee County and Exhibit 4-3 summarizes the demands for all qualified systems.

EXHIBIT 4-2
Example demand calculation

QWS	2035 Plant Capacity (PD-MGD) (1)	Percentage of PD-MGD	2035 Projected County Demand (AAD-MGD) (2)	2035 Projected QWS Demand (AAD-MGD) (3)
Cherokee County WSA	53	53/71, (74.6%)	**45**	33.6
City of Canton	18	18/71, (25.4%)		11.4
Total	**71**	**71/71, (100%)**		**45**

(1) 2035 Plant Capacity figures were obtained from the District's WSWCMP (2009) Appendix B
(2) 2035 Projected County Demand (AAD-MGD) was obtained from the District's WSWCMP (2009) Appendix B
(3) 2035 Projected QWS Demand (AAD-MGD) was calculated using methodology described in 4.1.2.
CCWSA: 53/71 * 45 = 33.6, Canton: 18/71*45 = 11.4

EXHIBIT 4-3
2035 Water Demands

County	Qualified Water System	2035 Demand (AAD-mgd)
Bartow	Adairsville, City of	3.6
Bartow	Bartow County	18.3
Bartow	Cartersville, City of	23.8
Bartow	Emerson, City of	0.3
Cherokee	Canton, City of	11.4
Cherokee	Cherokee County Water and Sewerage Authority	33.6
Clayton	Clayton County Water Authority	40.0
Cobb	Cobb County-Marietta Water Authority	143.0(1)
Cobb	Cobb County Water System	98.8(1)
Cobb	Marietta Power and Water	10.2(1)
Coweta	Coweta County Water and Sewerage Authority	16.2
Coweta	Newnan Utilities	12.4
Coweta	Senoia, City of	0.4
DeKalb	DeKalb County	106.0
Douglas	Douglasville-Douglas County Water and Sewer Authority	22.1
Fayette	Fayette County Water System	20.6
Fayette	Fayetteville, City of	2.4
Forsyth	Cumming, City of	20.8
Forsyth	Forsyth County Water and Sewer Department	39.2
Fulton	Atlanta, City of	154.8(2)
Fulton	Atlanta-Fulton County Water Resources Commission	86.0(2)
Fulton	East Point, City of	10.0
Fulton	Fulton County Water System	54.1(2)
Fulton	Palmetto, City of	3.1
Fulton	Roswell, City of	3.6
Gwinnett	Buford, City of	2.9
Gwinnett	Gwinnett County	137.1
Hall	Gainesville, City of	52.0
Henry	Henry County Water and Sewerage Authority	41.2
Henry	Locust Grove, City of	0.5
Henry	McDonough, City of	1.6
Paulding	Paulding County Water System	47.0(1)
Rockdale	Rockdale Water Resources	17.0

(1) Demands listed for Cobb County Water System, Marietta Power and Water, and Paulding County Water System are a subset of the demand listed for Cobb County-Marietta Water Authority
(2) Demands listed for Fulton County Water System and a portion of the City of Atlanta's demand is a subset of the demand listed for the Atlanta-Fulton County Water Resources Commission.

4.2 Reliability Targets

The reliability targets identified in Exhibit 4-4 reflect the amount of water needed by each QWS to meet 35 percent and 65 percent of AAD demands for the duration of the emergency. Once these figures were calculated, an evaluation was conducted to ensure that essential water needs for both current and future conditions are less than these reduced levels of usage.

Typically customers in the category of essential water needs are hospitals, nursing home/assisted living facilities, correctional facilities, and critical industry needs. For all QWSs, the essential water needs identified by the QWSs for their respective systems were less than the 35 percent and 65 percent immediate reliability targets (IRTs) and long-range reliability targets (LRRTs). Therefore, adjustments to the IRT and LRRT values are not necessary for any of the QWSs.

EXHIBIT 4-4
Reliability Target Verification

County	Qualified Water System	2006 Demand (AAD-mgd)	35% IRT (AAD-mgd)	65% IRT (AAD-mgd)	2035 Demand (AAD-mgd)	35% LRRT (AAD-mgd)	65% LRRT (AAD-mgd)
Bartow	Adairsville, City of	2.6	0.9	1.7	3.6	1.2	2.3
Bartow	Bartow County	6.9	2.4	4.5	18.3	6.4	11.9
Bartow	Cartersville, City of	13.9	4.9	9.0	23.8	8.3	15.5
Bartow	Emerson, City of	0.3	0.1	0.2	0.3	0.1	0.2
Cherokee	Canton, City of	3.4	1.2	2.2	11.4	4.0	7.4
Cherokee	Cherokee County Water and Sewerage Authority	16.6	5.8	10.8	33.6	11.8	21.8
Clayton	Clayton County Water Authority	29.7	10.4	19.3	40.0	14.0	26.0
Cobb	Cobb County-Marietta Water Authority	98.2	34.4	63.8	143.0	50.1	93.0
Cobb	Cobb County Water System	66.3	23.2	43.1	98.8	34.6	64.2
Cobb	Marietta Power and Water	10.2	3.6	6.6	10.2	3.6	6.6
Coweta	Coweta County Water and Sewerage Authority	6.4	2.2	4.2	16.2	5.7	10.6
Coweta	Newnan Utilities	7.0	2.5	4.6	12.4	4.3	8.1
Coweta	Senoia, City of	0.3	0.1	0.2	0.4	0.1	0.2
DeKalb	DeKalb County	82.8	29.0	53.8	106.0	37.1	68.9
Douglas	Douglasville-Douglas County Water and Sewer Authority	13.4	4.7	8.7	22.1	7.7	14.4
Fayette	Fayette County Water System	9.5	3.3	6.2	20.6	7.2	13.4
Fayette	Fayetteville, City of	1.9	0.7	1.3	2.4	0.8	1.5
Forsyth	Cumming, City of	11.9	4.2	7.8	20.8	7.3	13.5
Forsyth	Forsyth County Water and Sewer Department	11.9	4.2	7.7	39.2	13.7	25.5
Fulton	Atlanta, City of	116.7	40.9	75.9	154.8	54.2	100.6
Fulton	Atlanta-Fulton County Water Resources Commission	42.6	-	-	86.0	-	-
Fulton	East Point, City of	9.7	3.4	6.3	10.0	3.5	6.5
Fulton	Fulton County Water System	28.4	9.9	18.4	54.1	18.9	35.2
Fulton	Palmetto, City of	0.5	0.2	0.3	3.1	1.1	2.0
Fulton	Roswell, City of	3.6	1.2	2.3	3.6	1.3	2.3
Gwinnett	Buford, City of	1.5	0.5	1.0	2.9	1.0	1.9
Gwinnett	Gwinnett County	92.6	32.4	60.2	137.1	48.0	89.1

EXHIBIT 4-4
Reliability Target Verification

County	Qualified Water System	2006 Demand (AAD-mgd)	35% IRT (AAD-mgd)	65% IRT (AAD-mgd)	2035 Demand (AAD-mgd)	35% LRRT (AAD-mgd)	65% LRRT (AAD-mgd)
Hall	Gainesville, City of	19.1	6.7	12.4	52.0	18.2	33.8
Henry	Henry County Water and Sewerage Authority	16.4	5.7	10.7	41.2	14.4	26.8
Henry	Locust Grove, City of	0.5	0.2	0.3	0.5	0.2	0.3
Henry	McDonough, City of	1.4	0.5	0.9	1.6	0.6	1.0
Paulding	Paulding County Water System	10.9	3.8	7.1	47.0	16.5	30.6
Rockdale	Rockdale Water Resources	11.4	4.0	7.4	17.0	6.0	11.1

5.0 Water Supply Risk Evaluations

The following describes the emergency scenarios that were evaluated for each of the 33 QWSs, the methodology for those evaluations, and the critical scenarios selected for further hydraulic evaluation, which is described in Section 6.

5.1 Water Supply Risk Identification and Selection for Evaluation

The water supply risks and emergency scenarios evaluated in this study and the evaluation selection criteria used to determine which scenarios were assessed for which QWSs are shown in Exhibit 5-1.

EXHIBIT 5-1
Water Supply Risks and Emergency Scenarios

Water Supply Risk	Emergency Scenario	Type	Duration (days)	Evaluation Selection Criteria
A. Failure of largest water treatment facility	A1. Power supply failure of largest WTP	Short-term Defined Duration	1	QWSs that receive water from a system-owned (or partially owned) WTP
	A2. Critical asset failure at largest WTP (loss of flow splitting facility, filter gallery, clearwell, etc.)	Short-term Defined Duration	30	
B. Short-term catastrophic failure of a water distribution system	Critical asset failure [loss of transmission main(s) from largest WTP or major connection to another system where water is purchased	Short-term Defined Duration	1	QWSs with a water distribution system
C. Short-term contamination of a water supply within distribution system	Contamination of distribution system (typically due to loss of pressure) triggers issuance of boil water notice	Short-term Defined Duration	3	QWSs that receive water from a system-owned (or partially owned) WTP
D. Short-term contamination of a raw water source	D1. Biological contamination of largest raw water source	Short-term Defined Duration	1	QWSs that receive water from a water source that supplies a system-owned (or partially owned) WTP
	D2. Chemical contamination (fuel, industrial wastewater, etc.) of largest raw water source	Short-term Defined Duration	1	

EXHIBIT 5-1
Water Supply Risks and Emergency Scenarios

Water Supply Risk	Emergency Scenario	Type	Duration (days)	Evaluation Selection Criteria
E. Full unavailability of major raw water sources due to federal or state government actions	-	Long-term Undefined Duration	Long term (Undefined, greater than 1 year)	QWSs that receive water directly from the Chattahoochee River and/or Lake Lanier as a water source
F. Limited or reduced availability of major raw water sources due to federal or state government actions	-	Long-term Undefined Duration	Long term (Undefined, greater than 1 year)	QWSs that receive water directly from the Chattahoochee River and/or Lake Lanier as a water source
G. Failure of an existing dam of a raw water supply	Dam failure for largest impoundment (temporary pump station would be required and dam repair required)	Short-term Defined Duration	30	QWSs that own (or partially own) a reservoir or other impoundment (Lake Lanier and Lake Allatoona are not considered reservoirs or impoundments for this risk)
H. Water supply reduction due to drought	Water supply available is 40% of AAD demand due to drought	Short-term (4 months) Defined Duration	120	QWSs considered to be systems with reservoirs on small watersheds and no direct withdrawal from the Chattahoochee or Etowah Rivers

AAD = Annual Average Day

Water supply risks A through D and G identify short-term emergency scenarios, less than three days in most instances, but never more than 120 days. These scenarios represent the more traditional emergencies that utilities face and are typically prepared to address.

Risk H, the drought scenario, was added to the study scope because droughts can significantly affect QWS water supplies, especially those systems that are in the upper reaches of their watersheds. This risk was assessed only for systems considered most susceptible to drought, i.e., those with reservoirs in small watersheds with no direct withdrawal from the Chattahoochee or Etowah Rivers or the reservoirs located in those river basins. The drought scenario duration was assumed to be 120 days, because historically droughts in the area have been severe, but relatively short in duration. The deficits for this scenario were calculated using the assumption that once the drought is recognized, water managers will reduce their usage of their own limited water resources (local reservoir or wells) and will seek to maximize use of alternate emergency sources in order to extend the longevity of the local sources as far into the future as possible. To achieve this operational

condition, it was assumed that each QWS would seek to meet no more than 40 percent of its projected AAD flow from local sources, with the remaining quantities needed to meet the 65 percent planning benchmark coming from alternate emergency sources.

Risks E and F apply to the QWSs that receive water directly from the large federally regulated Lake Lanier/Chattahoochee River and Allatoona Lake/Etowah River systems. It was assumed that these scenarios would last for a long period of time, perhaps indefinitely. The evaluation criteria for these two scenarios differ from those for the short-term emergencies, because the level of infrastructure and reliability and redundancy needed to provide water for a lengthy period of time is different and more intensive than that necessary for short durations.

However, emergency scenarios E and F were not evaluated further during the hydraulic evaluation. The WSIRRA provides that the "emergency plan shall evaluate risks..." related to, among other things, the unavailability of major raw water sources (O.C.G.A. § 12-5-202(b)-(c)). The 11th U.S. Circuit Court of Appeals recently issued a decision in the tri-state water litigation related to Lake Lanier, in which the court reversed the district court's 2009 decision. The decision of the 11th Circuit is still pending further appeal, and should it stand, the U.S. Army Corps of Engineers will take certain actions on remand to determine how much raw water is available for Georgia's use from Lake Lanier. All of these issues are vital to a proper evaluation of risk. Accordingly, further work will be necessary to complete this element of the emergency plan.

5.2 Water Supply Risk Evaluation

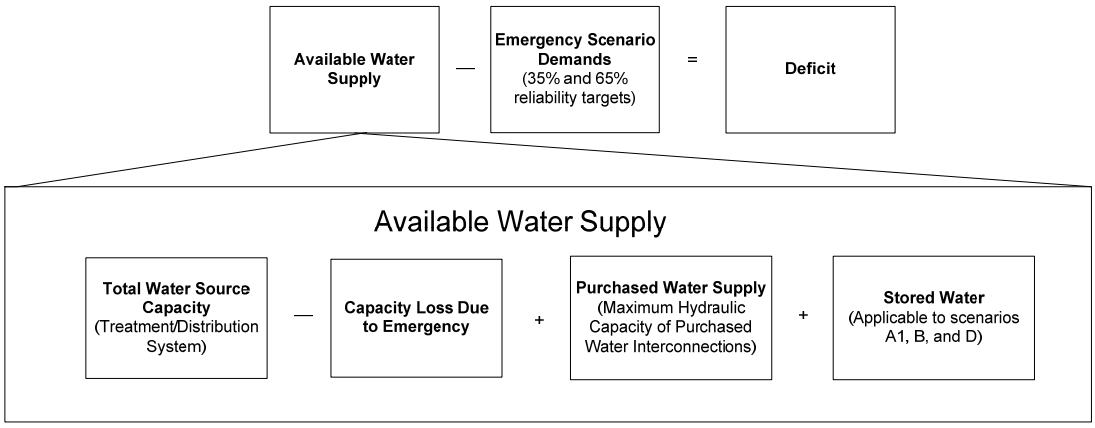
5.2.1 Overview of Risk Evaluation Methodology

The purpose of the risk evaluation was to calculate the expected water deficits associated with each applicable emergency scenario.

Eight emergency scenarios were considered. Based on the criteria summarized in Exhibit 5-1, some scenarios were not applicable to all QWSs and were not evaluated. As outlined in Exhibit 5-2, the deficit is equal to the available water supply during each emergency minus the demand at the appropriate reliability target (see Exhibit 4-4). The reliability targets reflect the amount of water needed for each QWS to meet 35 percent and 65 percent of AAD demand for current and future conditions. These water demand values are constants in that they are not dependent on the emergency scenario. By contrast, the available water supply values are variables that depend on the emergency scenario.

To assess whether each QWS has sufficient water supply available under the various emergency scenarios, it was necessary to evaluate each QWS's capability to produce water under the constraints of the respective emergency scenarios. Once the water supply availability was calculated for each scenario, then a deficit was established for each scenario.

EXHIBIT 5-2
Risk Evaluation Methodology



Before the QWSs could be evaluated for each emergency scenario, it was necessary to calculate the maximum water production for each QWS. Because most of the emergency scenarios have a short term duration (less than 120 days), the water supply capacities were calculated based on maximum daily production capability rather than annual average day production. Each QWS was evaluated individually to determine its maximum daily production. The factors used to determine the maximum daily production included some or all of the following and are described below:

- Surface water supply (reservoir, river, etc.) capacity;
- Groundwater supply capacity;
- WTP capacity;
- Water supply through regular purchased water interconnections (i.e., water purchased from other utilities that was delivered via normally open interconnections); and
- Water storage tank capacity in distribution system.

As shown in Exhibit 5-2, the deficit calculation is dependent on the calculated available water supply and demand. The following key components of the calculation were identified for each applicable emergency scenario:

- **Total Water Source Capacity** – The peak day total water capacity. For a QWS with multiple WTPs, the WTPs were listed individually and their capacities totaled.

- **Capacity Loss** Due to Emergency– The peak day capacity loss based on the characteristics of the QWS and the impact of the emergency scenario. For example, in emergency scenario A1, the largest WTP is assumed to be out of service when a power outage occurs, and the lost capacity used for this analysis would be that portion of the plant that is not supplied power by emergency generators. For emergency scenario C, short-term contamination of a water supply system, there would be no capacity loss, because a boil water notice would be issued and non-potable water would be delivered to customers. Specific assumptions for the various emergency scenarios are documented in Exhibit 5-3.

- **Purchased Water Supply through Existing Normally Open Interconnections** – The maximum hydraulic capacity of the interconnections used to regularly purchase water based on specific hydraulic criteria (pressure and velocity). The pressure and velocity data were provided by each QWS and were verified through hydraulic calculations or modeling. Section 6 includes a discussion of the methodologies used to develop the available quantities of purchased water for these QWSs.

- **Stored Water** – For emergency scenarios of one day or less, the water stored in the distribution system could be used to offset a loss of production. The stored water quantity was calculated based on 60 percent of clearwell storage and distribution system tank storage available within a QWS. The emergency scenarios with a one-day duration were scenarios A1, B, D1 and D2.
- **Reliability Target** – The methodology for developing the 2006 and 2035 demands is documented in Section 4. The demands listed in Exhibit 4-3 were used in this evaluation. The IRTs for 2006 and LRRTs for 2035 are equal to 35 percent and 65 percent of the 2006 and 2035 demands.
- **Deficit** –The deficit accounts for the hydraulic capacity of normally open interconnections, but it does not take into account normally closed interconnections.

To develop a conservative emergency plan, the emergency scenario with the largest deficit and longest duration was selected for further evaluation, as described in the following section.

EXHIBIT 5-3
Key Assumptions Used in Evaluation of Short-Term Defined Duration Scenarios

Emergency Scenario	Assumptions
A1. Power supply failure of largest WTP	• Deficits are calculated for power outage at the WTP which creates the largest loss of treatment capacity • Credit for water production is provided only for those plants with emergency generators at their plants. No credit was provided for water plants with separate, independent electrical supply because of service outages of up to one day reported by several utilities with this arrangement • Production capacity calculated for WTPs during a power outage is based on the installed generator capacity and which unit processes and pumps the generator provides power to • 60% of the QWS distribution system storage is available for water supply at the beginning of the emergency
A2. Critical asset failure at largest WTP (loss of flow splitting facility, filter gallery, clearwell, etc.)	• Deficits are calculated for critical asset failure at the WTP which creates the largest loss of treatment capacity • Each plant was evaluated for equipment, piping and unit process redundancy and ability to operate treatment processes at a higher rate • Because this scenario is a longer term emergency (up to 30 days), the distribution system storage cannot be used to offset the deficit
B. Critical asset failure [loss of transmission main(s) from largest WTP]	• This scenario assumed a failure of the largest single distribution main leaving the largest WTP • Crossovers and redundant transmission mains can reduce the deficits • 60% of distribution system storage is available at the beginning of the emergency to help offset the deficit from this scenario
C. Contamination of distribution system (typically due to a loss of pressure)-issuance of boil water notice	• No capacity is lost, WTPs remain in service but all water in system is assumed to be non-potable • QWS would implement system-wide flushing to remove contaminant from distribution system • QWS implements conventional emergency measures (boil water notice, system purging, etc.)
D1. Biological contamination of largest raw water source	• Deficits are calculated for contamination of the raw water source for the WTP which creates the largest reduction in water production capacity • Each QWS was evaluated based on the stored volume of raw and clearwell storage that would offset the loss of the primary raw water supply

EXHIBIT 5-3
Key Assumptions Used in Evaluation of Short-Term Defined Duration Scenarios

Emergency Scenario	Assumptions
D2. Chemical contamination (fuel, industrial wastewater, etc.) of largest raw water source	• 60% of raw and finished water storage is available at the beginning of the emergency to help offset the loss of raw water
G. Dam failure for largest impoundment (temporary pump station would be required and dam repair required)	• Deficits are calculated for loss of raw water source • Because this scenario is a longer term emergency (up to 30 days), the distribution system storage cannot be used to offset the deficit
H. Water supply available is 40% of AAD demand due to drought	• Relatively short drought that only affects systems in small watershed that do not use the Etowah River/Lake Allatoona or Chattahoochee River/Lake Lanier • Assumes that once the drought is recognized, water managers will reduce their usage of their own limited water resources (local reservoir or wells) and will maximize the use of alternate emergency sources to extend the longevity of the local sources. • Assumes that each system would seek to meet no more than 40% of their projected AAD demand from local sources. • Longer term emergency (up to 120 days)

5.2.2 Key Assumptions for Deficit Calculations

Computation of the deficit for each applicable short-term defined duration scenario depends on several foundational assumptions:

- Only the largest infrastructure element related to supply, treatment or distribution is out of service at one time.
- Only one emergency occurs at one time for scenarios A, B, C, D1 and D2 (i.e., no multi-system emergencies at one time).
- As part of the future water supply calculation for each QWS, it was assumed that all planned water plant production capacity additions or expansions will be implemented as defined in the District's WSWCMP or a utility's current water master plan or capital improvement program. It was assumed that these projects would be constructed by 2035; however, if these projects are reduced in scope or deleted, then the 2035 deficit calculations will need to be reevaluated. Cost estimates for these District-identified projects were not included in this study. Exhibit 5-4 summarizes some key District-identified projects.
- Systems may be able to exceed existing permitted withdrawal or treatment capacity during short (less than 30 days) duration emergencies with EPD approval.
- Water withdrawal limits in existing permits will not be reduced in the future, and existing water purchase contracts from adjacent QWSs will remain intact in the future.

EXHIBIT 5-4
Key District-Identified Projects

County	Qualified Water System	2009 District Recommended Projects
Bartow	Adairsville, City of	Adairsville WTP Expansion to 6 mgd
Bartow	Bartow County	New 30 mgd Etowah River WTP
Bartow	Cartersville, City of	Cartersville WTP Expansion to 40 mgd
Bartow	Emerson, City of	-
Cherokee	Canton, City of	Canton WTP Expansion to 18 mgd
Cherokee	Cherokee County Water and Sewerage Authority	Cherokee County Water and Sewerage Authority Etowah River WTP Expansion to 53 mgd
Clayton	Clayton County Water Authority	WTP expansions totaling 37 mgd
Cobb	Cobb County-Marietta Water Authority	Quarles WTP Expansion to 106 mgd Wyckoff WTP Expansion to 142 mgd
Cobb	Cobb County Water System	-
Cobb	Marietta Power and Water	-
Coweta	Coweta County Water and Sewerage Authority	B.T. Brown WTP Expansion to 10 mgd
Coweta	Newnan Utilities	Hershall Norred WTP Expansion to 21 mgd
Coweta	Senoia, City of	Senoia WTP Expansion to 0.6 mgd
DeKalb	DeKalb County	Scott Candler WTP Expansion to 175 mgd
Douglas	Douglasville-Douglas County Water and Sewer Authority	Bear Creek WTP Expansion to 23 mgd
Fayette	Fayette County Water and Sewer Department	Fayette Crosstown WTP or South Fayette WTP Expansions to 35 mgd
Fayette	Fayetteville, City of	New off-stream storage for Fayetteville WTP
Forsyth	Cumming, City of	Cumming WTP Expansion to 36 mgd
Forsyth	Forsyth County Water and Sewer Department	Forsyth WTP Expansion to 68 mgd
Fulton	Atlanta, City of	-
Fulton	Atlanta-Fulton County Water Resources Commission	Atlanta-Fulton County WTP Expansion to 155 mgd
Fulton	East Point, City of	-
Fulton	Fulton County Water System	New 20 mgd Etowah WTP New 15 mgd Bear Creek WTP
Fulton	Palmetto, City of	-
Fulton	Roswell, City of	Roswell WTP Expansion to 5 mgd
Gwinnett	Buford, City of	Buford WTP Expansion to 4.83 mdg
Gwinnett	Gwinnett County	-
Hall	Gainesville, City of	Gainesville Lakeside WTP Expansion to 46 mgd New 12 mgd Gainesville/Hall County Cedar Creek WTP Construction
Henry	Henry County Water and Sewerage Authority	Towaliga River WTP Expansion to 29 mgd Tussahaw WTP Expansion to 52 mgd and new reservoir
Henry	Locust Grove, City of	-
Henry	McDonough, City of	McDonough WTP Expansion to 3.1 mgd
Paulding	Paulding County Water System	New 40 mgd Paulding WTP
Rockdale	Rockdale Water Resources	Rockdale WTP Expansion to 32.1 mgd

5.3 Water Supply Risk Selection for Further Evaluation

Exhibit 5-5 summarizes the calculated deficits for the IRT and LRRT demand conditions. Emergency scenarios marked with an N/A were not applicable for the particular QWS, and emergency scenarios with dashes did not have a deficit (i.e., zero or a surplus). Of the 33 QWSs, eight did not have a deficit or were evaluated as part of another QWS (e.g., Cobb County Water System and Marietta Power and Water were evaluated as part of the Cobb County-Marietta Water Authority system).

For each QWS experiencing more than one deficit, the highest deficit with the longest duration scenario was selected for additional evaluation. These are called the Critical Scenario Deficits.

Those QWSs without Critical Scenario Deficits have sufficient emergency readiness, i.e., they are ready to meet the IRT and LRRT demands for all emergency scenarios applicable to them. The QWSs with Critical Scenario Deficits are at various stages of readiness depending on the availability and hydraulic capacities of their existing interconnections, their possibilities for new interconnections, and their already planned projects described in the District's WSWCMP.

EXHIBIT 5-5
Deficit Summary

County	Qualified Water System	Risk Scenario, Duration (Days)	2006 Available Water Supply (mgd)	2006 Demands (AAD-mgd)			Normal Operating Deficit for Critical Scenario (AAD-mgd)[1]		2035 Available Water Supply (mgd)	2035 Demands (AAD-mgd)			Normal Operating Deficit for Critical Scenario (AAD-mgd)[1]	
				100% Demand	35% Demand	65% Demand	35% IRT Deficit	65% IRT Deficit		100% Demand	35% Demand	65% Demand	35% LRRT Deficit	65% LRRT Deficit
Bartow	Adairsville, City of	A1, 1	4.0	2.6	0.9	1.7	-	-	6.0	3.6	1.3	2.3	-	-
		A2, 30	**0.0**	**2.6**	**0.9**	**1.7**	**0.9**	**1.7**	**0.0**	**3.6**	**1.3**	**2.3**	**1.3**	**2.3**
		B, 1	0.0	2.6	0.9	1.7	0.9	1.7	0.0	3.6	1.3	2.3	1.3	2.3
		C, 3	4.0	2.6	0.9	1.7	-	-	6.0	3.6	1.3	2.3	-	-
		D1, 1	0.0	2.6	0.9	1.7	0.9	1.7	0.0	3.6	1.3	2.3	1.3	2.3
		D2, 1	0.0	2.6	0.9	1.7	0.9	1.7	0.0	3.6	1.3	2.3	1.3	2.3
		E, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		F, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		G, 30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		H, 120	1.0	2.6	0.9	1.7	-	0.7	1.6	3.6	1.3	2.3	-	0.7
Bartow	Bartow County Water Department	A1, 1	32.8	6.9	2.4	4.5	-	-	33.6	18.3	6.4	11.9	-	-
		A2, 30	32.8	6.9	2.4	4.5	-	-	33.6	18.3	6.4	11.9	-	-
		B, 1	32.8	6.9	2.4	4.5	-	-	33.6	18.3	6.4	11.9	-	-
		C, 3	32.8	6.9	2.4	4.5	-	-	63.6	18.3	6.4	11.9	-	-
		D1, 1	32.8	6.9	2.4	4.5	-	-	63.6	18.3	6.4	11.9	-	-
		D2, 1	32.8	6.9	2.4	4.5	-	-	63.6	18.3	6.4	11.9	-	-
		E, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		F, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		G, 30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		H, 120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bartow	Cartersville, City of	A1, 1	27.0	13.9	4.9	9.0	-	-	40.0	23.8	8.3	15.5	-	-
		A2, 30	**0.0**	**13.9**	**4.9**	**9.0**	**4.9**	**9.0**	**0.0**	**23.8**	**8.3**	**15.5**	**8.3**	**15.5**
		B, 1	0.0	13.9	4.9	9.0	4.9	9.0	0.0	23.8	8.3	15.5	8.3	15.5
		C, 3	27.0	13.9	4.9	9.0	-	-	40.0	23.8	8.3	15.5	-	-
		D1, 1	0.0	13.9	4.9	9.0	4.9	9.0	0.0	23.8	8.3	15.5	8.3	15.5
		D2, 1	0.0	13.9	4.9	9.0	4.9	9.0	0.0	23.8	8.3	15.5	8.3	15.5
		E, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		F, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		G, 30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		H, 120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bartow	Emerson, City of	A1, 1	0.5	0.3	0.1	0.2	-	-	0.5	0.3	0.1	0.2	-	-
		A2, 30	**0.0**	**0.3**	**0.1**	**0.2**	**0.1**	**0.2**	**0.0**	**0.3**	**0.1**	**0.2**	**0.1**	**0.2**
		B, 1	0.0	0.3	0.1	0.2	0.1	0.2	0.0	0.3	0.1	0.2	0.1	0.2
		C, 3	0.5	0.3	0.1	0.2	-	-	0.5	0.3	0.1	0.2	-	-
		D1, 1	0.0	0.3	0.1	0.2	0.1	0.2	0.0	0.3	0.1	0.2	0.1	0.2
		D2, 1	0.0	0.3	0.1	0.2	0.1	0.2	0.0	0.3	0.1	0.2	0.1	0.2
		E, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		F, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		G, 30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		H, 120	0.1	0.3	0.1	0.2	-	0.1	0.1	0.3	0.1	0.2	-	0.1

EXHIBIT 5-5
Deficit Summary

County	Qualified Water System	Risk Scenario, Duration (Days)	2006 Available Water Supply (mgd)	2006 Demands (AAD-mgd)			Normal Operating Deficit for Critical Scenario (AAD-mgd)[1]		2035 Available Water Supply (mgd)	2035 Demands (AAD-mgd)			Normal Operating Deficit for Critical Scenario (AAD-mgd)[1]	
				100% Demand	35% Demand	65% Demand	35% IRT Deficit	65% IRT Deficit		100% Demand	35% Demand	65% Demand	35% LRRT Deficit	65% LRRT Deficit
Cherokee	Canton, City of	A1, 1	1.6	3.4	1.2	2.2	-	0.6	2.8	11.4	4.0	7.4	1.2	4.6
		A2, 30	**1.1**	**3.4**	**1.2**	**2.2**	**0.1**	**1.1**	**1.1**	**11.4**	**4.0**	**7.4**	**2.9**	**6.3**
		B, 1	1.1	3.4	1.2	2.2	0.1	1.1	1.1	11.4	4.0	7.4	2.9	6.3
		C, 3	6.6	3.4	1.2	2.2	-	-	19.1	11.4	4.0	7.4	-	-
		D1, 1	1.1	3.4	1.2	2.2	0.1	1.1	1.1	11.4	4.0	7.4	2.9	6.3
		D2, 1	1.1	3.4	1.2	2.2	0.1	1.1	1.1	11.4	4.0	7.4	2.9	6.3
		E, 365+	1.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		F, 365+	1.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		G, 30	6.6	3.4	1.2	2.2	-	-	6.6	11.4	4.0	7.4	-	0.9
		H, 120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cherokee	Cherokee County Water and Sewerage Authority	A1, 1	18.0	16.6	5.8	10.8	-	-	33.0	33.6	11.8	21.8	-	-
		A2, 30	38.0	16.6	5.8	10.8	-	-	53.0	33.6	11.8	21.8	-	-
		B, 1	10.2	16.6	5.8	10.8	-	0.6	10.2	33.6	11.8	21.8	1.6	11.6
		C, 3	38.0	16.6	5.8	10.8	-	-	53.0	33.6	11.8	21.8	-	-
		D1, 1	21.6	16.6	5.8	10.8	-	-	21.6	33.6	11.8	21.8	-	0.2
		D2, 1	21.6	16.6	5.8	10.8	-	-	21.6	33.6	11.8	21.8	-	0.2
		E, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		F, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		G, 30	**6.5**	**16.6**	**5.8**	**10.8**	**-**	**4.3**	**6.5**	**33.6**	**11.8**	**21.8**	**5.3**	**15.3**
		H, 120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Clayton	Clayton County Water Authority	A1, 1	29.5	29.7	10.4	19.3	-	-	63.5	40.0	14.0	26.0	-	-
		A2, 30	19.5	29.7	10.4	19.3	-	-	47.5	40.0	14.0	26.0	-	-
		B, 1	19.5	29.7	10.4	19.3	-	-	47.5	40.0	14.0	26.0	-	-
		C, 3	39.5	29.7	10.4	19.3	-	-	79.5	40.0	14.0	26.0	-	-
		D1, 1	19.5	29.7	10.4	19.3	-	-	47.5	40.0	14.0	26.0	-	-
		D2, 1	19.5	29.7	10.4	19.3	-	-	47.5	40.0	14.0	26.0	-	-
		E, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		F, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		G, 30	19.5	29.7	10.4	19.3	-	-	42.5	40.0	14.0	26.0	-	-
		H, 120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cobb	Cobb County-Marietta Water Authority, Cobb County Water System, Marietta Power and Water	A1, 1	72.0	98.2	34.4	63.8	-	-	106.0	143.0	50.1	93.0	-	-
		A2, 30	72.0	98.2	34.4	63.8	-	-	106.0	143.0	50.1	93.0	-	-
		B, 1	72.0	98.2	34.4	63.8	-	-	106.0	143.0	50.1	93.0	-	-
		C, 3	158.0	98.2	34.4	63.8	-	-	248.0	143.0	50.1	93.0	-	-
		D1, 1	86.0	98.2	34.4	63.8	-	-	106.0	143.0	50.1	93.0	-	-
		D2, 1	86.0	98.2	34.4	63.8	-	-	106.0	143.0	50.1	93.0	-	-
		E, 365+	84.0	98.2	34.4	63.8	-	-	112.5	143.0	50.1	93.0	-	-
		F, 365+	98.2	98.2	34.4	63.8	-	-	126.7	143.0	50.1	93.0	-	-
		G, 30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		H, 120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

EXHIBIT 5-5
Deficit Summary

County	Qualified Water System	Risk Scenario, Duration (Days)	2006 Available Water Supply (mgd)	2006 Demands (AAD-mgd)			Normal Operating Deficit for Critical Scenario (AAD-mgd)[1]		2035 Available Water Supply (mgd)	2035 Demands (AAD-mgd)			Normal Operating Deficit for Critical Scenario (AAD-mgd)[1]	
				100% Demand	35% Demand	65% Demand	35% IRT Deficit	65% IRT Deficit		100% Demand	35% Demand	65% Demand	35% LRRT Deficit	65% LRRT Deficit
Coweta	Coweta County Water and Sewerage Authority	A1, 1	21.2	6.4	2.2	4.2	-	-	23.5	16.2	5.7	10.5	-	-
		A2, 30	13.5	6.4	2.2	4.2	-	-	13.5	16.2	5.7	10.5	-	-
		B, 1	13.5	6.4	2.2	4.2	-	-	13.5	16.2	5.7	10.5	-	-
		C, 3	21.2	6.4	2.2	4.2	-	-	23.5	16.2	5.7	10.5	-	-
		D1, 1	13.5	6.4	2.2	4.2	-	-	13.5	16.2	5.7	10.5	-	-
		D2, 1	13.5	6.4	2.2	4.2	-	-	13.5	16.2	5.7	10.5	-	-
		E, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		F, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		G, 30	13.5	6.4	2.2	4.2	-	-	13.5	16.2	5.7	10.5	-	-
		H, 120	**2.6**	**6.4**	**2.2**	**4.2**	**-**	**1.6**	**6.4**	**16.2**	**5.7**	**10.5**	**-**	**4.1**
Coweta	Newnan Utilities	A1, 1	14.0	7.0	2.5	4.6	-	-	21.0	12.4	4.3	8.1	-	-
		A2, 30	**0.0**	**7.0**	**2.5**	**4.6**	**2.5**	**4.6**	**0.0**	**12.4**	**4.3**	**8.1**	**4.3**	**8.1**
		B, 1	0.0	7.0	2.5	4.6	2.5	4.6	0.0	12.4	4.3	8.1	4.3	8.1
		C, 3	14.0	7.0	2.5	4.6	-	-	21.0	12.4	4.3	8.1	-	-
		D1, 1	14.0	7.0	2.5	4.6	-	-	21.0	12.4	4.3	8.1	-	-
		D2, 1	14.0	7.0	2.5	4.6	-	-	21.0	12.4	4.3	8.1	-	-
		E, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		F, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		G, 30	14.0	7.0	2.5	4.6	-	-	21.0	12.4	4.3	8.1	-	-
		H, 120	2.8	7.0	2.5	4.6	-	1.8	4.8	12.4	4.3	8.1	-	3.3
Coweta	Senoia, City of	A1, 1	0.3	0.3	0.1	0.2	-	-	0.3	0.4	0.1	0.3	-	-
		A2, 30	0.3	0.3	0.1	0.2	-	-	0.3	0.4	0.1	0.3	-	-
		B, 1	0.3	0.3	0.1	0.2	-	-	0.3	0.4	0.1	0.3	-	-
		C, 3	0.7	0.3	0.1	0.2	-	-	0.9	0.4	0.1	0.3	-	-
		D1, 1	0.3	0.3	0.1	0.2	-	-	0.3	0.4	0.1	0.3	-	-
		D2, 1	0.3	0.3	0.1	0.2	-	-	0.3	0.4	0.1	0.3	-	-
		E, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		F, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		G, 30	0.3	0.3	0.1	0.2	-	-	0.3	0.4	0.1	0.3	-	-
		H, 120	**0.4**	**0.3**	**0.1**	**0.2**	**-**	**-**	**0.2**	**0.4**	**0.1**	**0.3**	**-**	**0.1**
DeKalb	DeKalb County	A1, 1	128.0	82.8	29.0	53.8	-	-	175.0	106.0	37.1	68.9	-	-
		A2, 30	**0.0**	**82.8**	**29.0**	**53.8**	**29.0**	**53.8**	**0.0**	**106.0**	**37.1**	**68.9**	**37.1**	**68.9**
		B, 1	100.0	82.8	29.0	53.8	-	-	100.0	106.0	37.1	68.9	-	-
		C, 3	128.0	82.8	29.0	53.8	-	-	175.0	106.0	37.1	68.9	-	-
		D1, 1	128.0	82.8	29.0	53.8	-	-	175.0	106.0	37.1	68.9	-	-
		D2, 1	128.0	82.8	29.0	53.8	-	-	175.0	106.0	37.1	68.9	-	-
		E, 365+	10.0	82.8	29.0	53.8	19.0	43.8	10.0	106.0	37.1	68.9	27.1	58.9
		F, 365+	82.8	82.8	29.0	53.8	-	-	82.8	106.0	37.1	68.9	-	-
		G, 30	0.0	82.8	29.0	53.8	29.0	53.8	0.0	106.0	37.1	68.9	37.1	68.9
		H, 120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

EXHIBIT 5-5
Deficit Summary

County	Qualified Water System	Risk Scenario, Duration (Days)	2006 Available Water Supply (mgd)	2006 Demands (AAD-mgd)			Normal Operating Deficit for Critical Scenario (AAD-mgd)[1]		2035 Available Water Supply (mgd)	2035 Demands (AAD-mgd)			Normal Operating Deficit for Critical Scenario (AAD-mgd)[1]	
				100% Demand	35% Demand	65% Demand	35% IRT Deficit	65% IRT Deficit		100% Demand	35% Demand	65% Demand	35% LRRT Deficit	65% LRRT Deficit
Douglas	DDCWSA	A1, 1	23.0	13.4	4.7	8.7	-	-	23.0	22.1	7.7	14.4	-	-
		A2, 30	**0.0**	**13.4**	**4.7**	**8.7**	**4.7**	**8.7**	**0.0**	**22.1**	**7.7**	**14.4**	**7.7**	**14.4**
		B, 1	0.0	13.4	4.7	8.7	4.7	8.7	0.0	22.1	7.7	14.4	7.7	14.4
		C, 3	23.0	13.4	4.7	8.7	-	-	23.0	22.1	7.7	14.4	-	-
		D1, 1	6.4	13.4	4.7	8.7	-	2.3	6.4	22.1	7.7	14.4	1.3	8.0
		D2, 1	6.4	13.4	4.7	8.7	-	2.3	6.4	22.1	7.7	14.4	1.3	8.0
		E, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		F, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		G, 30	6.4	13.4	4.7	8.7	-	2.3	6.4	22.1	7.7	14.4	1.3	8.0
		H, 120	5.4	13.4	4.7	8.7	-	3.4	8.8	22.1	7.7	14.4	-	5.6
Fayette	Fayette County Water System	A1, 1	23.3	9.5	3.3	6.2	-	-	16.9	20.6	7.2	13.4	-	-
		A2, 30	13.9	9.5	3.3	6.2	-	-	16.9	20.6	7.2	13.4	-	-
		B, 1	13.9	9.5	3.3	6.2	-	-	16.9	20.6	7.2	13.4	-	-
		C, 3	27.4	9.5	3.3	6.2	-	-	42.7	20.6	7.2	13.4	-	-
		D1, 1	30.7	9.5	3.3	6.2	-	-	32.7	20.6	7.2	13.4	-	-
		D2, 1	30.7	9.5	3.3	6.2	-	-	32.7	20.6	7.2	13.4	-	-
		E, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		F, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		G, 30	26.7	9.5	3.3	6.2	-	-	26.7	20.6	7.2	13.4	-	-
		H, 120	10.6	9.5	3.3	6.2	-	-	15.2	20.6	7.2	13.4	-	-
Fayette	Fayetteville, City of	A1, 1	9.8	1.9	0.7	1.2	-	-	9.8	2.4	0.8	1.6	-	-
		A2, 30	5.8	1.9	0.7	1.2	-	-	5.8	2.4	0.8	1.6	-	-
		B, 1	5.8	1.9	0.7	1.2	-	-	5.8	2.4	0.8	1.6	-	-
		C, 3	9.8	1.9	0.7	1.2	-	-	9.8	2.4	0.8	1.6	-	-
		D1, 1	5.8	1.9	0.7	1.2	-	-	5.8	2.4	0.8	1.6	-	-
		D2, 1	5.8	1.9	0.7	1.2	-	-	5.8	2.4	0.8	1.6	-	-
		E, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		F, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		G, 30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		H, 120	**0.8**	**1.9**	**0.7**	**1.2**	**-**	**0.5**	**0.8**	**2.4**	**0.8**	**1.6**	**-**	**0.8**
Forsyth	Cumming, City of	A1, 1	2.6	11.9	4.2	7.7	1.6	5.1	2.6	20.8	7.3	13.5	4.7	10.9
		A2, 30	**0.0**	**11.9**	**4.2**	**7.7**	**4.2**	**7.7**	**0.0**	**20.8**	**7.3**	**13.5**	**7.3**	**13.5**
		B, 1	2.6	11.9	4.2	7.7	1.6	5.1	2.6	20.8	7.3	13.5	4.7	10.9
		C, 3	24.0	11.9	4.2	7.7	-	-	36.0	20.8	7.3	13.5	-	-
		D1, 1	4.4	11.9	4.2	7.7	-	3.3	4.4	20.8	7.3	13.5	2.9	9.7
		D2, 1	4.4	11.9	4.2	7.7	-	3.3	4.4	20.8	7.3	13.5	2.9	9.1
		E, 365+	0.0	11.9	4.2	7.7	4.2	7.7	0.0	20.8	7.3	13.5	7.3	13.5
		F, 365+	11.9	11.9	4.2	7.7	-	-	11.9	20.8	7.3	13.5	-	1.6
		G, 30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		H, 120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

EXHIBIT 5-5
Deficit Summary

County	Qualified Water System	Risk Scenario, Duration (Days)	2006 Available Water Supply (mgd)	2006 Demands (AAD-mgd)			Normal Operating Deficit for Critical Scenario (AAD-mgd)[1]		2035 Available Water Supply (mgd)	2035 Demands (AAD-mgd)			Normal Operating Deficit for Critical Scenario (AAD-mgd)[1]	
				100% Demand	35% Demand	65% Demand	35% IRT Deficit	65% IRT Deficit		100% Demand	35% Demand	65% Demand	35% LRRT Deficit	65% LRRT Deficit
Forsyth	Forsyth County Water and Sewer Department	A1, 1	14.3	11.9	4.2	7.7	-	-	14.3	39.2	13.7	25.5	-	11.2
		A2, 30	**5.9**	**11.9**	**4.2**	**7.7**	**-**	**1.8**	**5.9**	**39.2**	**13.7**	**25.5**	**7.8**	**19.6**
		B, 1	14.3	11.9	4.2	7.7	-	-	14.3	39.2	13.7	25.5	-	11.2
		C, 3	34.6	11.9	4.2	7.7	-	-	73.9	39.2	13.7	25.5	-	-
		D1, 1	23.4	11.9	4.2	7.7	-	-	23.1	39.2	13.7	25.5	-	2.4
		D2, 1	23.4	11.9	4.2	7.7	-	-	23.4	39.2	13.7	25.5	-	2.1
		E, 365+	0.0	11.9	4.2	7.7	4.2	7.7	0.0	39.2	13.7	25.5	13.7	25.5
		F, 365+	16.5	11.9	4.2	7.7	-	-	16.5	39.2	13.7	25.5	-	9.0
		G, 30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		H, 120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Fulton	Atlanta, City of	A1, 1	246.4	116.7	40.8	75.9	-	-	278.9	154.8	54.2	100.6	-	-
		A2, 30	109.9	116.7	40.8	75.9	-	-	142.4	154.8	54.2	100.6	-	-
		B, 1	127.9	116.7	40.8	75.9	-	-	142.4	154.8	54.2	100.6	-	-
		C, 3	264.4	116.7	40.8	75.9	-	-	278.9	154.8	54.2	100.6	-	-
		D1, 1	225.0	116.7	40.8	75.9	-	-	278.9	154.8	54.2	100.6	-	-
		D2, 1	225.0	116.7	40.8	75.9	-	-	278.9	154.8	54.2	100.6	-	-
		E, 365+	14.5	116.7	40.8	75.9	26.3	61.4	14.5	154.8	54.2	100.6	39.7	86.1
		F, 365+	138.0	116.7	40.8	75.9	-	-	138.0	154.8	54.2	100.6	-	-
		G, 30	246.4	116.7	40.8	75.9	-	-	278.9	154.8	54.2	100.6	-	-
		H, 120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Fulton	Atlanta-Fulton County Water Resources Commission	A1, 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		A2, 30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		B, 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		C, 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		D1, 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		D2, 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		E, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		F, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		G, 30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		H, 120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Fulton	East Point, City of	A1, 1	10.0	9.7	3.4	6.3	-	-	10.0	10.0	3.5	6.5	-	-
		A2, 30	**0.0**	**9.7**	**3.4**	**6.3**	**3.4**	**6.3**	**0.0**	**10.0**	**3.5**	**6.5**	**3.5**	**6.5**
		B, 1	0.0	9.7	3.4	6.3	3.4	6.3	0.0	10.0	3.5	6.5	3.5	6.5
		C, 3	13.9	9.7	3.4	6.3	-	-	13.9	10.0	3.5	6.5	-	-
		D1, 1	13.9	9.7	3.4	6.3	-	-	13.9	10.0	3.5	6.5	-	-
		D2, 1	13.9	9.7	3.4	6.3	-	-	13.9	10.0	3.5	6.5	-	-
		E, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		F, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		G, 30	13.2	9.7	3.4	6.3	-	-	13.9	10.0	3.5	6.5	-	-
		H, 120	3.9	9.7	3.4	6.3	-	2.4	4.0	10.0	3.5	6.5	-	2.5

EXHIBIT 5-5
Deficit Summary

County	Qualified Water System	Risk Scenario, Duration (Days)	2006 Available Water Supply (mgd)	2006 Demands (AAD-mgd)			Normal Operating Deficit for Critical Scenario (AAD-mgd)[1]		2035 Available Water Supply (mgd)	2035 Demands (AAD-mgd)			Normal Operating Deficit for Critical Scenario (AAD-mgd)[1]	
				100% Demand	35% Demand	65% Demand	35% IRT Deficit	65% IRT Deficit		100% Demand	35% Demand	65% Demand	35% LRRT Deficit	65% LRRT Deficit
Fulton	Fulton County Water System	A1, 1	45.0	28.4	9.9	18.5	-	-	97.5	54.1	18.9	35.2	-	-
		A2, 30	**0.0**	**28.4**	**9.9**	**18.5**	**9.9**	**18.5**	**20.0**	**54.1**	**18.9**	**35.2**	**-**	**15.2**
		B, 1	14.7	28.4	9.9	18.5	-	3.7	34.7	54.1	18.9	35.2	-	0.4
		C, 3	45.0	28.4	9.9	18.5	-	-	97.5	54.1	18.9	35.2	-	-
		D1, 1	45.0	28.4	9.9	18.5	-	-	97.5	54.1	18.9	35.2	-	-
		D2, 1	45.0	28.4	9.9	18.5	-	-	97.5	54.1	18.9	35.2	-	-
		E, 365+	2.5	28.4	9.9	18.5	7.4	16.0	17.5	54.1	18.9	35.2	1.4	17.7
		F, 365+	21.3	28.4	9.9	18.5	-	-	36.3	54.1	18.9	35.2	-	-
		G, 30	45.0	28.4	9.9	18.5	-	-	97.5	54.1	18.9	35.2	-	-
		H, 120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Fulton	Palmetto, City of	A1, 1	0.2	0.5	0.2	0.3	-	0.1	0.8	3.1	1.1	2.0	0.3	1.2
		A2, 30	**0.0**	**0.5**	**0.2**	**0.3**	**0.2**	**0.3**	**0.6**	**3.1**	**1.1**	**2.0**	**0.5**	**1.4**
		B, 1	0.2	0.5	0.2	0.3	-	0.1	0.8	3.1	1.1	2.0	0.3	1.2
		C, 3	0.6	0.5	0.2	0.3	-	-	5.6	3.1	1.1	2.0	-	-
		D1, 1	0.3	0.5	0.2	0.3	-	0.1	0.9	3.1	1.1	2.0	0.2	1.2
		D2, 1	0.3	0.5	0.2	0.3	-	0.1	0.9	3.1	1.1	2.0	0.2	1.2
		E, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		F, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		G, 30	0.0	0.5	0.2	0.3	0.2	0.3	0.6	3.1	1.1	2.0	0.5	1.4
		H, 120	0.2	0.5	0.2	0.3	-	0.1	1.2	3.1	1.1	2.0	-	0.8
Fulton	Roswell, City of	A1, 1	3.5	3.6	1.3	2.3	-	-	3.5	3.6	1.3	2.3	-	-
		A2, 30	3.5	3.6	1.3	2.3	-	-	3.5	3.6	1.3	2.3	-	-
		B, 1	3.5	3.6	1.3	2.3	-	-	3.5	3.6	1.3	2.3	-	-
		C, 3	4.7	3.6	1.3	2.3	-	-	8.5	3.6	1.3	2.3	-	-
		D1, 1	3.5	3.6	1.3	2.3	-	-	3.5	3.6	1.3	2.3	-	-
		D2, 1	3.5	3.6	1.3	2.3	-	-	3.5	3.6	1.3	2.3	-	-
		E, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		F, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		G, 30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		H, 120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gwinnett	Buford, City of	A1, 1	0.0	1.5	0.5	1.0	0.5	1.0	0.0	2.9	1.0	1.9	1.0	1.9
		A2, 30	**0.0**	**1.5**	**0.5**	**1.0**	**0.5**	**1.0**	**0.0**	**2.9**	**1.0**	**1.9**	**1.0**	**1.9**
		B, 1	0.0	1.5	0.5	1.0	0.5	1.0	0.0	2.9	1.0	1.9	1.0	1.9
		C, 3	2.0	1.5	0.5	1.0	-	-	4.8	2.9	1.0	1.9	-	-
		D1, 1	0.0	1.5	0.5	1.0	0.5	1.0	0.0	2.9	1.0	1.9	1.0	1.9
		D2, 1	0.0	1.5	0.5	1.0	0.5	1.0	0.0	2.9	1.0	1.9	1.0	1.9
		E, 365+	2.0	1.5	0.5	1.0	-	-	2.0	2.9	1.0	1.9	-	-
		F, 365+	2.0	1.5	0.5	1.0	-	-	2.0	2.9	1.0	1.9	-	-
		G, 30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		H, 120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

EXHIBIT 5-5
Deficit Summary

County	Qualified Water System	Risk Scenario, Duration (Days)	2006 Available Water Supply (mgd)	2006 Demands (AAD-mgd)			Normal Operating Deficit for Critical Scenario (AAD-mgd)[1]		2035 Available Water Supply (mgd)	2035 Demands (AAD-mgd)			Normal Operating Deficit for Critical Scenario (AAD-mgd)[1]	
				100% Demand	35% Demand	65% Demand	35% IRT Deficit	65% IRT Deficit		100% Demand	35% Demand	65% Demand	35% LRRT Deficit	65% LRRT Deficit
Gwinnett	Gwinnett County	A1, 1	225.0	92.6	32.4	60.2	-	-	225.0	137.1	48.0	89.1	-	-
		A2, 30	**75.0**	**92.6**	**32.4**	**60.2**	**-**	**-**	**75.0**	**137.1**	**48.0**	**89.1**	**-**	**14.1**
		B, 1	111.7	92.6	32.4	60.2	-	-	111.7	137.1	48.0	89.1	-	-
		C, 3	225.0	92.6	32.4	60.2	-	-	225.0	137.1	48.0	89.1	-	-
		D1, 1	82.0	92.6	32.4	60.2	-	-	82.0	137.1	48.0	89.1	-	7.1
		D2, 1	82.0	92.6	32.4	60.2	-	-	82.0	137.1	48.0	89.1	-	7.1
		E, 365+	0.0	92.6	32.4	60.2	32.4	60.2	0.0	137.1	48.0	89.1	48.0	89.1
		F, 365+	92.6	92.6	32.4	60.2	-	-	92.6	137.1	48.0	89.1	-	-
		G, 30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		H, 120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Hall	Gainesville, City of	A1, 1	32.0	19.1	6.7	12.4	-	-	37.0	52.0	18.2	33.8	-	-
		A2, 30	22.0	19.1	6.7	12.4	-	-	37.0	52.0	18.2	33.8	-	-
		B, 1	22.0	19.1	6.7	12.4	-	-	37.0	52.0	18.2	33.8	-	-
		C, 3	47.0	19.1	6.7	12.4	-	-	83.0	52.0	18.2	33.8	-	-
		D1, 1	**32.3**	**19.1**	**6.7**	**12.4**	**-**	**-**	**32.3**	**52.0**	**18.2**	**33.8**	**-**	**1.5**
		D2, 1	**32.3**	**19.1**	**6.7**	**12.4**	**-**	**-**	**32.3**	**52.0**	**18.2**	**33.8**	**-**	**1.5**
		E, 365+	17.0	19.1	6.7	12.4	-	-	17.0	52.0	18.2	33.8	1.2	16.8
		F, 365+	28.1	19.1	6.7	12.4	-	-	28.1	52.0	18.2	33.8	-	5.7
		G, 30	35.0	19.1	6.7	12.4	-	-	71.0	52.0	18.2	33.8	-	-
		H, 120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Henry	Henry County Water and Sewerage Authority	A1, 1	14.1	16.2	5.7	10.5	-	-	30.1	41.2	14.4	26.8	-	-
		A2, 30	14.1	16.2	5.7	10.5	-	-	30.1	41.2	14.4	26.8	-	-
		B, 1	14.1	16.2	5.7	10.5	-	-	30.1	41.2	14.4	26.8	-	-
		C, 3	38.1	16.2	5.7	10.5	-	-	82.1	41.2	14.4	26.8	-	-
		D1, 1	37.6	16.2	5.7	10.5	-	-	82.1	41.2	14.4	26.8	-	-
		D2, 1	37.6	16.2	5.7	10.5	-	-	82.1	41.2	14.4	26.8	-	-
		E, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		F, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		G, 30	24.1	16.2	5.7	10.5	-	-	30.1	41.2	14.4	26.8	-	-
		H, 120	**7.7**	**16.2**	**5.7**	**10.5**	**-**	**2.9**	**17.5**	**41.2**	**14.4**	**26.8**	**-**	**9.3**
Henry	Locust Grove, City of	A1, 1	3.2	0.5	0.2	0.3	-	-	3.2	0.5	0.2	0.3	-	-
		A2, 30	3.2	0.5	0.2	0.3	-	-	3.2	0.5	0.2	0.3	-	-
		B, 1	3.2	0.5	0.2	0.3	-	-	3.2	0.5	0.2	0.3	-	-
		C, 3	3.7	0.5	0.2	0.3	-	-	3.7	0.5	0.2	0.3	-	-
		D1, 1	3.2	0.5	0.2	0.3	-	-	3.2	0.5	0.2	0.3	-	-
		D2, 1	3.2	0.5	0.2	0.3	-	-	3.2	0.5	0.2	0.3	-	-
		E, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		F, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		G, 30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		H, 120	**0.2**	**0.5**	**0.2**	**0.3**	**-**	**0.1**	**0.2**	**0.5**	**0.2**	**0.3**	**-**	**0.1**

EXHIBIT 5-5
Deficit Summary

County	Qualified Water System	Risk Scenario, Duration (Days)	2006 Available Water Supply (mgd)	2006 Demands (AAD-mgd)			Normal Operating Deficit for Critical Scenario (AAD-mgd)[1]		2035 Available Water Supply (mgd)	2035 Demands (AAD-mgd)			Normal Operating Deficit for Critical Scenario (AAD-mgd)[1]	
				100% Demand	35% Demand	65% Demand	35% IRT Deficit	65% IRT Deficit		100% Demand	35% Demand	65% Demand	35% LRRT Deficit	65% LRRT Deficit
Henry	McDonough, City of	A1, 1	3.3	1.4	0.5	0.9	-	-	4.0	1.6	0.6	1.0	-	-
		A2, 30	0.9	1.4	0.5	0.9	-	-	0.9	1.6	0.6	1.0	-	0.1
		B, 1	0.9	1.4	0.5	0.9	-	-	0.9	1.6	0.6	1.0	-	0.1
		C, 3	3.3	1.4	0.5	0.9	-	-	4.0	1.6	0.6	1.0	-	-
		D1, 1	0.9	1.4	0.5	0.9	-	-	0.9	1.6	0.6	1.0	-	0.1
		D2, 1	0.9	1.4	0.5	0.9	-	-	0.9	1.6	0.6	1.0	-	0.1
		E, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		F, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		G, 30	0.9	1.4	0.5	0.9	-	-	0.9	1.6	0.6	1.0	-	0.1
		H, 120	**0.6**	**1.4**	**0.5**	**0.9**	**-**	**0.3**	**0.6**	**1.6**	**0.6**	**1.0**	**-**	**0.4**
Paulding	Paulding County Water System	A1, 1	N/A	N/A	N/A	N/A	N/A	N/A	28.0	47.0	16.5	30.6	-	2.6
		A2, 30	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**28.0**	**47.0**	**16.5**	**30.6**	**-**	**2.6**
		B, 1	N/A	N/A	N/A	N/A	N/A	N/A	28.0	47.0	16.5	30.6	-	2.6
		C, 3	N/A	N/A	N/A	N/A	N/A	N/A	68.0	47.0	16.5	30.6	-	-
		D1, 1	N/A	N/A	N/A	N/A	N/A	N/A	28.0	47.0	16.5	30.6	-	2.6
		D2, 1	N/A	N/A	N/A	N/A	N/A	N/A	28.0	47.0	16.5	30.6	-	2.6
		E, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		F, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		G, 30	N/A	N/A	N/A	N/A	N/A	N/A	28.0	47.0	16.5	30.6	-	2.6
		H, 120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rockdale	Rockdale Water Resources	A1, 1	17.7	11.4	4.0	7.4	-	-	26.7	17.0	6.0	11.1	-	-
		A2, 30	**0.0**	**11.4**	**4.0**	**7.4**	**4.0**	**7.4**	**0.0**	**17.0**	**6.0**	**11.1**	**6.0**	**11.1**
		B, 1	0.0	11.4	4.0	7.4	4.0	7.4	0.0	17.0	6.0	11.1	6.0	11.1
		C, 3	22.1	11.4	4.0	7.4	-	-	32.1	17.0	6.0	11.1	-	-
		D1, 1	0.0	11.4	4.0	7.4	4.0	7.4	0.0	17.0	6.0	11.1	6.0	11.1
		D2, 1	0.0	11.4	4.0	7.4	4.0	7.4	0.0	17.0	6.0	11.1	6.0	11.1
		E, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		F, 365+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		G, 30	3.2	11.4	4.0	7.4	0.8	4.2	3.2	17.0	6.0	11.1	2.8	7.9
		H, 120	4.6	11.4	4.0	7.4	-	2.9	6.8	17.0	6.0	11.1	-	4.3

Notes:
1 - Dash indicates a zero or surplus, rather than a deficit.

6.0 Evaluation of Potential Projects

This section identifies and evaluates potential projects for ensuring that all QWSs will meet the readiness targets described in section 5. As shown in Exhibit 5-5, 12 QWSs had Critical Scenario Deficits and thus did not meet either the current or future water emergency readiness. As a result, new interconnections and internal system redundancy alternatives were evaluated. A hydraulic and economic evaluation was performed for these QWSs to arrive at a recommended list of projects.

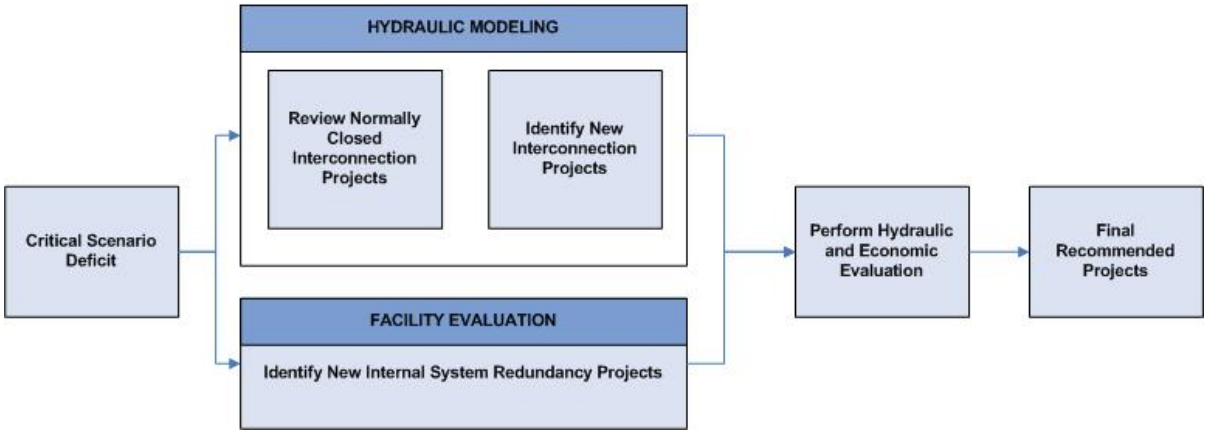
6.1 Methodology

The initial step in the analysis considered existing available capacity from normally closed interconnections. Additionally, new system interconnections and new internal system redundancy projects were evaluated. With respect to new interconnections, hydraulic evaluations were conducted to determine the optimum locations and sizes of new or expanded interconnections with adjacent QWSs. This was conducted using a two-step process that included developing emergency flow balance diagram spreadsheets in order to solve the mass balance of flows within and surrounding the QWS during the critical emergency. Second, after selecting potential interconnections using the flow balance diagram tool, additional hydraulic modeling was conducted using the individual hydraulic models described in Section 5 or by merging multiple QWSs into a larger system model to better simulate the hydraulics between various water systems.

In addition to investigating potential interconnection strategies with adjacent QWSs, internal system redundancy alternatives were evaluated to determine if WTP process or pipeline redundancy projects could mitigate the critical scenario. Frequently these redundancy alternatives are already included in the QWSs' master plans or CIPs.

Cost estimates were developed to allow for a comparison of the total cost of new interconnection(s) against internal infrastructure redundancy costs to verify the viability of the projects and to provide enough information to choose the final recommended projects for each QWS. The existing normally closed interconnections identified in Section 5 were considered along with the new projects to develop a final recommended project list as shown in Exhibit 6-1.

EXHIBIT 6-1
Methodology for Determining Recommended Projects



6.2 Hydraulic Modeling

Hydraulic models were developed during this study to review the hydraulic capacities of existing interconnections and determine the locations and hydraulic capacities of new interconnections.

6.2.1 Hydraulic Model Development

During the data collection effort described in Section 2, most QWSs provided water distribution hydraulic computer models, each at varying states of completeness and in different software platforms. As shown in Exhibit 6-2, nearly two-thirds of the QWSs were able to provide a hydraulic model. The following describes the QWSs that did not provide hydraulic models and whether or not new models were needed and prepared for this study:

- No models were provided or developed during this study for the four QWSs within Bartow County: the cities of Adairsville, Cartersville and Emerson, and the Bartow County system. (During this study, it was determined that the two primary alternatives to satisfying the emergency deficit were a single long distance interconnection or redundancy improvements at the primary WTP. For this reason, the economies of scale of the two projects were apparent, and the development of new hydraulic computer models was not necessary.)
- No models were provided or developed for the Fayette County Water System or the city of Fayetteville, because the Critical Scenario Deficit for the city was small enough that it did not warrant development of a new computer model.
- Four smaller QWSs (the cities of Senoia, Buford, Locust Grove and McDonough) were treated as demand nodes within larger system models due to the simplicity of the system hydraulics.
- The Atlanta-Fulton County Water Resources Commission was not modeled because it has no internal distribution system.
- East Point and Palmetto QWSs were modeled for interconnection capacity only.
- A model was not provided for DeKalb County; however, a skeletonized model was developed during this study using GIS data.

Exhibit 6-2 also shows the number of existing interconnections for each QWS.

EXHIBIT 6-2
Hydraulic Model Summary

County	Qualified Water System	Model Received from Qualified Water System	Model Comments	Number of Interconnections
Bartow	Adairsville, City of		Model not developed	5
Bartow	Bartow County		Model not developed	19
Bartow	Cartersville, City of		Model not developed	10
Bartow	Emerson, City of		Model not developed	1
Cherokee	Canton, City of	√ (WaterGEMS)	Model is not calibrated so it was used for information only	5
Cherokee	Cherokee County Water and Sewerage Authority	√ (InfoWorx WS)	Skeletonized the model to remove existing isolation valves	45
Clayton	Clayton County Water Authority	√ (H2O Map)		18
Cobb	Cobb County-Marietta Water Authority	√ (SynerGEE)	Includes pipes ≥ 6 inches	81+
Cobb	Cobb County Water System	√ (SynerGEE)	Part of the Cobb County-Marietta Water Authority Model	5
Cobb	Marietta Power and Water	√ (SynerGEE)		20+
Coweta	Coweta County Water and Sewerage Authority	√ (WaterCAD)	Includes pipes ≥ 6 inches	15
Coweta	Newnan Utilities	√ (WaterCAD)	Part of the Coweta County Water and Sewerage Authority model	5
Coweta	Senoia, City of		Modeled as demand nodes in Coweta County Water and Sewerage Authority model	5
DeKalb	DeKalb County		Developed new model with InfoWorks WS using GIS data Includes pipes > 12 inches and some <12 inches at service area boundaries	8
Douglas	Douglasville-Douglas County Water and Sewer Authority	√ (WaterCAD)		8

EXHIBIT 6-2
Hydraulic Model Summary

County	Qualified Water System	Model Received from Qualified Water System	Model Comments	Number of Interconnections
Fayette	Fayette County Water and Sewer Department		Model not developed	12
Fayette	Fayetteville, City of		Model not developed	7
Forsyth	Cumming, City of	√ (WaterGEMS)		13
Forsyth	Forsyth County Water and Sewer Department	√ (H2O Map)		19
Fulton	Atlanta, City of	√ (SynerGEE and EPA Net)		21
Fulton	Atlanta-Fulton County Water Resources Commission		No distribution system	N/A
Fulton	East Point, City of		Modeled as demand nodes in City of Atlanta model	4
Fulton	Fulton County Water System	√ (H20 Map)		3
Fulton	Palmetto, City of		Modeled as demand node in City of Atlanta model	2
Fulton	Roswell, City of	√ (H2O Map)	Was not needed	6
Gwinnett	Buford, City of		Modeled as demand nodes in Gwinnett County model	5
Gwinnett	Gwinnett County	√ (WaterGEMS)	Model was skeletonized from 120,000 pipes to 16,000 pipes	29
Hall	Gainesville, City of	√ (H2O Map)		3
Henry	Henry County Water and Sewerage Authority	√ (WaterCAD)		19
Henry	Locust Grove, City of		Modeled as demand nodes in Henry County model	3
Henry	McDonough, City of		Modeled as demand nodes in Henry County model	3
Paulding	Paulding County Water System	√ (WaterCAD)		9
Rockdale	Rockdale Water Resources	√ (H2O Map)		7

6.2.2 Hydraulic Modeling Criteria

Two hydraulic criteria were utilized during the hydraulic computer model analysis to estimate interconnection capacity: maximum velocity and pressure.

6.2.2.1 Maximum Velocity Criteria

For adjacent QWSs with a large difference in hydraulic gradient, the maximum velocity approach was typically required. In this approach the velocity of the water traveling through the pipes between systems was monitored in the model runs to determine the maximum interconnection capacity. The following maximum velocity criteria were used to determine the interconnection hydraulic capacities: 3 feet per second (fps) for pipe diameters greater than or equal to 16 inches and 5 fps for pipe diameters less than or equal to 12 inches. These velocity criteria are commonly used as guidance when calculating pipe flow capacity.

6.2.2.2 Pressure Criteria

If customer pressures in the vicinity of the open interconnection (donor or receiver systems) in the model runs varied by more than 15 percent above or below normal operating pressures, the selected capacity was limited to a reduced maximum velocity (i.e., lower than 3 or 5 fps depending on pipe diameter) in the model runs. This pressure criterion ensures that the area of the QWS supplying system in the vicinity of the interconnection does not experience excessively low pressures that could compromise fire protection sprinkler system designs and result in unacceptable service and public safety risks. In addition, this pressure criterion prevents receiver systems from experiencing excessively high pressures (which increase the risks of pipe bursts) local to the interconnection location. For those QWSs with significantly different head conditions, it was assumed that a pressure reducing valve existed or that the isolation valve was throttled in a manner that limited the velocity and/or pressure to the maximum criteria stated above.

For adjacent QWSs with similar hydraulic gradients, or for systems that supply large flows from one to another, a pressure criterion was applied in addition to the velocity criteria outlined above. To limit the pressure drop during the hydraulic evaluation, a pressure sustaining valve model element was used to establish the minimum supplying QWS system pressure at the interconnection to no more than 15 percent below the normal operating pressure. The addition of this pressure sustaining valve (even though a control valve may not actually exist) is a hydraulic modeling approach to limit the flow through the interconnection to the pressure drop of 15 percent at the interconnection. Iterative model runs were performed until the maximum velocity or pressure criteria were achieved.

6.2.3 Hydraulic Modeling and Evaluation Approach

The hydraulic evaluation differed depending on whether or not deficits occurred, as reported in Exhibit 5-5. For QWSs without deficits a level of service verification was performed. For QWSs with a critical scenario deficit, modeling and/or other hydraulic evaluations were conducted to determine the hydraulic capacity of existing interconnections, to examine new interconnections, and to evaluate water treatment plant redundancy projects.

6.2.3.1 Level of Service Verification for Emergency System Operation

Hydraulic modeling was conducted for QWSs that did not exhibit Critical Scenario Deficits. This hydraulic modeling was performed because the operating conditions mitigating the Critical Scenario Deficits may not be typical operating conditions for a QWS and may include a large facility out of service that is normally in operation. The hydraulic modeling was performed to confirm that the QWS can operate in this redundant fashion without compromising the level of service (i.e., pressure criteria). For example, this type of hydraulic modeling was performed for the city of Atlanta, Cobb County-Marietta Water Authority, the city of Gainesville, and the Clayton County Water Authority. None of these systems had compromised level of service (i.e., low pressures) during the atypical emergency operation based on the modeling analysis.

6.2.3.2 Hydraulic Evaluation of Existing Interconnections

The hydraulic capacities of existing normally open and normally closed interconnections were evaluated and confirmed using the hydraulic computer models listed in Exhibit 6-2. For most systems, individual hydraulic models were utilized. This required adding a reservoir model element to simulate the hydraulic gradient or elevated tank overflow elevation of the receiving water system. In some cases more advanced merged models were used, as explained in section 6.2.3.3.2.

Normally closed (or emergency) interconnections are maintained in order to provide additional water supply from a neighboring utility during a water emergency. These interconnections are used only occasionally and are usually opened only to meet specific temporary needs. The disadvantages to using a particular normally closed interconnection on a regular basis may include: dissimilar water pressure zones (WPZs) and the inability to control flow to/from another QWS, water quality concerns, regulatory liability, or cost of the purchased water. Cost factors cannot be overlooked; it should be noted that frequent purchase of water from an adjacent QWS may have a negative financial impact on the receiving QWS. In the course of the study, it was found that most of the QWSs have normally closed (or emergency) interconnections with neighboring water systems.

For adjacent QWSs where the difference in the hydraulic gradient between the QWSs was greater than 25 feet and/or the largest Critical Scenario Deficit was less than 2 mgd, hydraulic modeling was not applied to determine the interconnection capacity. In these cases, the interconnection capacity was set by the hydraulic calculations on the interconnection pipe size.

6.2.3.3 Hydraulic Evaluation of Potential Interconnections

Following the evaluation of existing interconnections, new interconnections and system redundancy projects were identified. This required a detailed understanding of the water treatment and distribution systems and in most cases required hydraulic modeling.

6.2.3.3.1 Emergency Flow Balance Diagram Tools

A spreadsheet tool was developed for the study called the emergency flow balance diagram that was used to determine the magnitude of flow needed from adjacent water systems to satisfy the IRT and LRRT demands for the critical scenarios. This spreadsheet tool consists of a GIS map background of one or more QWSs and flow balance calculations accounting for supply sources, demands by WPZ, and interconnections with adjacent water systems. By incorporating the WPZ hydraulic gradient values, the user can see which systems can provide flow by gravity and which ones would likely need to pump flow to an adjacent QWS.

The initial flow balance calculation was developed for each QWS with the treatment plants and normally open interconnections in service under 2006 and 2035 demand conditions. Then, the critical scenario was evaluated under IRT and LRRT demand conditions. Plant flow rates associated with the critical scenario were incorporated into the flow balance to determine the number and capacity of interconnections that would be needed to satisfy the Critical Scenario Deficits.

6.2.3.3.2 Additional Hydraulic Model Development and Merge Process

After the new interconnections were established using the emergency flow balance diagrams, modeling was performed. Some larger QWSs with large Critical Scenario Deficits required more extensive hydraulic modeling. This modeling was conducted by merging multiple QWS models together into one computer model to more accurately simulate existing and new interconnection options. This approach allowed for the interaction of system conditions to provide more reliable results for the QWS supplying water (donor) and the QWS receiving water (receiver).

To facilitate the merging of multiple QWS computer models, each model was converted from its native software platform to the Bentley WaterGEMS software platform. Next, six hydraulic modeling cases were developed: 2006 100 percent demand, 2006 65 percent IRT demand, 2006 35 percent IRT demand, 2035 100 percent LRRT

demand, 2035 65 percent LRRT demand, and 2035 35 percent LRRT demand. Boundary conditions for each case (tank level, pump/valve on/off status) were developed so that each individual scenario was hydraulically balanced. For a system to be hydraulically balanced, the supply to the system equals the demand, floating storage in the system is not contributing to meeting the demand, and the floating storage is also not filling. This step is critical so that the model represents a realistic "steady-state" hydraulic condition. If the model was not hydraulically balanced, and a tank was rapidly filling or draining in a scenario, the actual hydraulic capacity within the QWS as represented by the hydraulic model would not be accurate.

Once the individual QWS models were completed and fully functional, the models were merged in a step-wise fashion. For example, for merging of three individual hydraulic models, Model 1 would be merged with Model 2 and then Model 3 would be merged with the Combined Model 1+2. The merged models that were developed during this study included:

- City of Atlanta, DeKalb County, Gwinnett County
- Forsyth County, city of Cumming, Fulton County, city of Gainesville, Gwinnett County
- City of Atlanta, DeKalb County, Gwinnett County, Forsyth County, city of Cumming, Fulton County, city of Gainesville

6.2.3.4 Water Treatment Plant Evaluation

In addition to evaluating how QWSs can transfer water among adjacent systems, the WTPs at each QWS with only one plant were evaluated to determine what improvements would be necessary to provide full redundancy for each unit process, treatment train, storage tank and flow distribution structure. The projects required to provide this level of redundancy at the WTP were evaluated to determine if they provided greater infrastructure redundancy, lower cost or lower cost operations than the distribution infrastructure projects that may involve construction of multiple, long distance pipelines and/or pump stations that would have significant cost and potentially limited use during normal operations.

By potentially incorporating new process units or parallel pipelines at the WTP, the redundant water treatment capacity would increase, thus reducing the Critical Scenario Deficit and lessening the number of distribution projects. For example, if a WTP had a single raw water pipeline or flash mix reactor, but had two existing process trains through the rest of the WTP, a new parallel raw water pipeline or flash mix reactor would enable at least half the WTP to remain in service under a plant infrastructure emergency, thus reducing or eliminating the Critical Scenario Deficits.

6.3 Project Cost Estimates

Planning level project costs were developed for each of the potential project alternatives including: minor rehabilitation of existing normally closed interconnections, construction of new interconnections, and construction of new internal infrastructure redundancy projects. Costs were not developed for previously planned projects identified in CIPs by the QWSs or in the District's WSWCMP; however, the costs were documented when available from the QWSs.

The following sections describe the methodology for development of the unit costs.

6.3.1 Unit Cost Development

Unit costs were developed for new pipelines, pump stations, and control valve stations; for rehabilitation of existing normally closed interconnections; and for new projects. The developed unit costs for new projects include engineering, permitting, right-of-way acquisition, contractor markups, and services during construction (SDC).

6.3.1.1 Pipeline Unit Costs

The pipeline unit cost information originated from data provided by several QWSs during the data collection phase of the project. The data were evaluated and any markups not already included were applied as necessary. Markups that had to be added were engineering (10 percent), permitting (2 percent), SDC (5 percent), and land/right-of-way acquisition (5 percent). After these markups were added to the provided project costs, the project costs were escalated to year 2011 dollars and divided by the total linear feet (lf) for the project to obtain total project unit costs.

To verify the unit costs a representative project for six pipe sizes (ranging from 8-60 inches) was created using CH2M HILL Parametric Cost Estimating System (CPES). The representative project included 5,000 lf of pipeline with 4 feet of cover in a moderately congested area and an additional 100 feet of pipeline and installation using bore and jack methods. Contractor markups applied to the projects in CPES included overhead (10 percent), profit (5 percent), mobilization / bonds / insurance (5 percent), and contingency (5 percent). The markups discussed above for engineering, permitting, SDC, and land/right-of-way acquisition costs were also added. Thus, the QWS-provided costs and the separate CPES costs should be directly comparable.

The CPES and QWS unit costs were compared, and the highest cost was selected for each pipe size. A cost curve was created for pipes ranging in size from 4 to 60 inches and was used to provide unit costs for each pipe size, as shown in Exhibit 6-3.

EXHIBIT 6-3
Pipeline Unit Costs

Pipe Size (inches)	Ductile Iron Pipe ($/lf)
4	$215
6	$230
8	$245
10	$260
12	$280
14	$295
16	$315
24	$410
27	$455
30	$500
36	$615
42	$750
48	$910
54	$1,110
60	$1,355

Notes: Unit costs are inclusive of engineering, permitting, right-of-way acquisition, contractor markups, and SDC.

6.3.1.2 Pump Station Unit Costs

Pump station costs were developed from the costs developed by the Technical Advisory Board for the Governor's Task Force under Governor Perdue. The Governor's Task Force costs were based on pump horsepower and were converted to flow rate assuming a discharge pressure of 50 pounds per square inch (psi).

To verify the Governor's Task Force costs, several vertical turbine pump projects were created using CPES. Contractor markups applied to the projects in CPES were the same as those for the pipeline work. Other markups added to account for all aspects of project costs were engineering (15 percent), permitting (2 percent), SDC (8 percent), and land/right-of-way acquisition (2 percent).

The CPES and Governor's Task Force costs were compared, and the CPES prices were selected, because they were more conservative. A cost curve was created for a range of flow rates and was used to develop fully inclusive pump station costs. Exhibit 6-4 lists the costs for pump stations ranging from a capacity of 5-35 mgd.

EXHIBIT 6-4
Pump Station Unit Costs

Pump Size (horsepower)	Flow (mgd)	$/Pump Station
100	5	$2,090,000
300	15	$3,220,000
500	25	$4,700,000
700	35	$6,320,000

Notes: Unit costs are inclusive of engineering, permitting, right-of-way acquisition, contractor markups, and SDC.

6.3.1.3 Control Valve Station Unit Costs

Costs for control valve stations, which are required at some interconnection points, were calculated using a combination of CPES costs and vendor costs. CPES was used to estimate the cost of cast-in-place valve vaults, isolation valves, and associated piping at the vault. Vendor costs for the pressure control valves were obtained from a major manufacturer and were entered into CPES. The contractor-applied markups in CPES were the same as those used for the pipeline costs. Other markups added to account for all aspects of project costs were engineering (15 percent), permitting (2 percent), and SDC (8 percent). It was assumed that the valve vault would be located in an easement already associated with a pipeline; therefore, no markup was added for land/right-of-way acquisition.

A cost curve was created for the different sizes of pressure control valves and was used to ascertain fully inclusive control valve vault costs for valve sizes ranging from 4 to 36 inches (see Exhibit 6-5).

EXHIBIT 6-5
Control Valve Station Unit Costs

Valve Size (inches)	Control Valve Station Unit Costs ($)
4	$ 70,000
6	$ 80,000
8	$ 90,000
10	$100,000
12	$120,000
14	$140,000
16	$160,000
24	$290,000
27	$360,000
30	$450,000
36	$690,000

Notes: Unit costs are inclusive of engineering, permitting, right-of-way acquisition, contractor markups, and SDC.

6.3.1.4 Existing Normally Closed Interconnection Costs

Some QWSs can eliminate or reduce the Critical Scenario Deficits by utilizing existing normally closed interconnections. Field visits and evaluations will need to be conducted to determine if any of the following types of work are needed: piping modifications within the vaults, new control valve, expanded vault, supervisory control and data acquisition, (SCADA) connection/hardware, and/or electrical upgrades. Some interconnections may not require any work, while others may need significant modifications. Based on engineering judgment a placeholder cost of $50,000 was used to account for the work that may be required to make an existing normally closed interconnection serviceable; however, actual costs will be based on site specific conditions.

6.3.2 Project Cost Development Summary

The unit costs discussed in the previous section were used to develop planning level cost estimates for the potential projects identified to eliminate the deficits. The following summarizes how the unit costs were applied:

- **Existing Interconnections** – Each normally closed existing interconnection being recommended is assigned a cost of $50,000, as described in Section 6.3.1.4.
- **New Interconnections** – New interconnections typically require some length of piping and a control valve vault. The length and size of pipe, as determined through hydraulic modeling, were used to determine the total pipeline cost using unit costs presented in Exhibit 6-3. The size of the control valve required at the connection point was used to estimate the cost of the control valve vault using unit costs presented in

Exhibit 6-5. In some instances, a new connection requires a pump station to be able to move water from one WPZ to another. The appropriate pump station unit costs were based on the flow rates shown in Exhibit 6-4.

- **Internal Infrastructure Redundancy Projects** – Costs were developed on a case by case basis, unless these projects (and associated costs) were already planned and included in a QWS's master plan or CIP.

7.0 Recommended Projects

After the projects were identified, evaluated and cost-estimated, the most appropriate and cost effective project(s) were selected for each QWS with a deficit. These projects can be categorized as follows:

- **Upgrades to Existing Interconnections** - Normally closed existing interconnections were assessed for their potential to reduce or eliminate the Critical Scenario Deficits.
- **New Interconnections** – New or expanded interconnections were evaluated in the hydraulic models for their potential to reduce or eliminate the Critical Scenario Deficits. Each new interconnection is identified in terms of the pipes being connected, capacity and cost.
- **Internal Infrastructure Redundancy Projects** – Redundancy projects that could eliminate the deficits were identified and included projects such as: raw water intakes, parallel raw or finished water pipelines, parallel treatment units, pumping stations, etc. In some instances these new redundancy projects completely eliminate the deficits without the installation of new interconnections or use of existing normally closed interconnections. Projects in this category may also include previously planned projects from a QWS's CIP or master plan, or plant expansions presented in the District's WSWCMP. Final costs for these internally developed projects were not developed but were included where available from the QWSs.

Exhibit 7-1 provides the final recommended project list for the 33 QWSs. The total cost for all of the improvements is estimated to be $63 million.

7.1.1 Prioritization Approach

A decision analysis approach was developed to guide QWS staff and policy makers regarding project implementation. The results of any prioritization are best regarded and applied as decision aids. Results should inform rather than dictate the decision. The analysis provides a way of organizing and comparing complex information.

The prioritization approach has four basic steps:

- Finalize evaluation criteria;
- Finalize scoring guidelines and performance measures to objectively score each project;
- Score projects using prioritization approach; and
- Make final decision about projects and schedule.

The success of any prioritization approach rests on how well the evaluation criteria, scoring guidelines and performance measures accurately reflect the goals and objectives of the project. Key considerations when developing these approaches include:

- Do the criteria and performance measures make sense, and are they applicable across a broad range of projects?
- Can each criterion and performance measure be easily understood for applicability?
- Are the criteria weighted appropriately?
- Is there adequate separation between scores for each performance measure?
- When reviewing the weighted scores for each project, are the projects in an intuitive priority ranking and do they make sense?
- Are the criteria and performance measures non-redundant? It is important that the performance measures do not address overlapping aspects of each project to prevent "double-counting" the same attribute.

EXHIBIT 7-1
Recommended Project List

County	Qualified Water System	Upgrade to Existing Interconnections	Cost ($)	New Interconnection or Redundancy Projects	Cost ($)	Total Cost ($)
Bartow	Adairsville, City of	Bartow 03: Existing 12" Calhoun to existing 12" Adairsville pipe)	$50,000	Bartow 01: New 8" interconnection with Calhoun	$3,030,000	$3,080,000
Bartow	Bartow County	No recommended project	$0	No recommended project	$0	$0
Bartow	Cartersville, City of	No recommended project	$0	Bartow 02: New redundant rapid mix/splitter structure at Walker WTP	$500,000	$500,000
Bartow	Emerson, City of	Bartow 04: Existing 6" Bartow County to existing 6" Emerson pipe	$50,000	No recommended project	$0	$50,000
Cherokee	Canton, City of	No recommended project	$0	Cherokee 01: Inclusion of process redundancy in Canton Bobby Brown WTP expansion	$400,000	$400,000
Cherokee	Cherokee County Water and Sewerage Authority	No recommended project	$0	Cherokee 02: Obtain permit variance to withdraw from river without reservoir augmentation	$0	$0
Clayton	Clayton County Water Authority	No recommended project	$0	No recommended project	$0	$0
Cobb	Cobb County-Marietta Water Authority	No recommended project	$0	No recommended project	$0	$0
Cobb	Cobb County Water System	No recommended project	$0	No recommended project	$0	$0
Cobb	Marietta Power and Water	No recommended project	$0	No recommended project	$0	$0
Coweta	Coweta County Water and Sewerage Authority	Coweta 04: Existing 24" Atlanta to existing 24" Coweta pipe Coweta 05: Existing 24" Atlanta to existing 24" Coweta pipe	$100,000	No recommended project	$0	$100,000
Coweta	Newnan Utilities	No recommended project	$0	Coweta 01: Flow reversal at existing 16" Newnan interconnection with existing 16" Coweta pipe Coweta 02: Flow reversal at existing 10" Newnan interconnection with existing 12" Coweta pipe Coweta 03: Flow reversal at existing 20" Newnan interconnection with existing 20" Coweta pipe	$150,000	$150,000
Coweta	Senoia, City of	Coweta 06: Existing 8” Coweta to existing 8” Senoia pipe to receive water from other qualified water systems	$50,000	No recommended project	$0	$50,000
DeKalb	DeKalb County	No recommended project	$0	DeKalb 01: Upgrades to Scott Candler WTP to add redundancy to the existing clearwell, pump stations to move the water between the clearwells and storage tanks	$35,700,000	$35,700,000
Douglas	DDCWSA	Douglas 02: Existing 20" CCMWA to existing 20" Douglas pipe Douglas 03: Existing 16" CCMWA to existing 16" Douglas pipe Douglas 04: Existing 12" CCWS to existing 12" Douglas pipe	$150,000	Douglas 01: New 24" interconnection with CCMWA	$500,000	$650,000
Fayette	Fayette County Water and Sewer Department	No recommended project	$0	No recommended project	$0	$0
Fayette	Fayetteville, City of	Fayette 01: Use existing interconnections with Fayette County to receive water from other qualified water systems	$0	No recommended project	$0	$0
Forsyth	Cumming, City of	No recommended project	$0	Forsyth 01: Incorporate redundancy into Cumming WTP expansion Forsyth 03: Flow reversal at existing North Forsyth interconnection Forsyth 04: Flow reversal at existing Old Atlanta Highway interconnection Forsyth 05: Flow reversal at existing Pendley interconnection Forsyth 06: Flow reversal at existing Castleberry interconnection Forsyth 07: Flow reversal at existing Kelly Mill interconnection Forsyth 08: Flow reversal at existing Bethelview interconnection Forsyth 09: Flow reversal at existing Doc Bramblett interconnection	$350,000	$350,000
Forsyth	Forsyth County Water and Sewer Department	Forsyth 10: Existing 16” Fulton pipe to existing 16’ Forsyth pipe	$50,000	Forsyth 02: Include Redundancy Upgrades as part of the Forsyth County WTP expansion	$5,000,000	$5,050,000

EXHIBIT 7-1
Recommended Project List

County	Qualified Water System	Upgrade to Existing Interconnections	Cost ($)	New Interconnection or Redundancy Projects	Cost ($)	Total Cost ($)
Fulton	Atlanta, City of	No recommended project	$0	Fulton 07: AFC WRC Redundancy Project (redundant post flash mix basin + 16" redundant pipe), Project is needed for the Fulton County critical scenario deficit but is shared with Fulton County Water System. Cost Represents one-half of the total cost.	$503,300	$503,300
Fulton	Atlanta-Fulton County Water Resources Commission	-	-	-	-	-
Fulton	East Point, City of	No recommended project	$0	Fulton 01: New 12" interconnection with Atlanta Fulton 02: New 12" interconnection with Atlanta Fulton 03: New 12" interconnection with Atlanta Fulton 04: New 12" interconnection with Atlanta Fulton 05: New 12" interconnection with Atlanta	$1,440,000	$1,440,000
Fulton	Fulton County Water System	No recommended project	$0	Fulton 07: AFC WRC Redundancy Project (redundant post flash mix basin + 16" redundant pipe) Project is needed for the Fulton County critical scenario deficit but is shared with Fulton County Water System. Cost Represents one-half of the total cost.	$503,300	$503,300
Fulton	Palmetto, City of	Fulton 08: Existing 8" Coweta to existing Palmetto pipe Fulton 09: Existing 8" Gwinnett to existing 8" Buford pipe	$100,000	Fulton 06: New 12" interconnection with Atlanta	$140,000	$240,000
Fulton	Roswell, City of	No recommended project	$0	No recommended project	$0	$0
Gwinnett	Buford, City of	Gwinnett 02: Existing 12" Gwinnett to existing 12" Buford pipe Gwinnett 03: Existing 8" Gwinnett to existing 8" Buford pipe Gwinnett 04: Existing 8" Gwinnett to existing Buford pipe Gwinnett 05: Existing 8" Gwinnett to existing Buford pipe	$200,000	No recommended project	$0	$200,000
Gwinnett	Gwinnett County	No recommended project	$0	Gwinnett 01: Shoal Creek Filter Plant Expansion (upgrade to Shoal Creek high service pump station per Gwinnett Master Plan)	$12,700,000	$12,700,000
Hall	Gainesville, City of	Hall 01: Existing 12” Gwinnett to existing 12” Gainesville pipe	$50,000	No recommended project	$0	$50,000
Henry	Henry County Water and Sewerage Authority	Henry 02: Existing 16" DeKalb to existing 16" Henry pipe Henry 03: Existing 12" Clayton to existing 12" Henry pipe Henry 04: Existing 6" Clayton to existing 12" Henry pipe	$150,000	Henry 01: New 24" interconnection with Clayton County from the Hooper WTP transmission main	$305,000	$460,000
Henry	Locust Grove, City of	No recommended project	$0	Utilize new Henry County interconnection (Henry 01) with Clayton County	$0	$0
Henry	McDonough, City of	No recommended project	$0	Utilize new Henry County interconnection (Henry 01) with Clayton County	$0	$0
Paulding	Paulding County Water System	Paulding 01: Existing 6" Cobb County-Marietta Water Authority pipe to existing 6" Paulding pipe	$50,000	No recommended project	-	$50,000
Rockdale	Rockdale Water Resources	Rockdale 02: Existing 24" Gwinnett to existing 24" Rockdale pipe Rockdale 03: Existing 12" Gwinnett to existing 8" Rockdale pipe Rockdale 04: Existing 8" DeKalb to existing 8" Rockdale pipe Rockdale 05: Existing 12" DeKalb to existing 12" Rockdale pipe	$200,000	Rockdale 01: Existing 12" Henry County pipe to new 12" Rockdale pipe	$205,000	$405,000
		TOTAL:	$1,200,000	TOTAL:	$61,426,600	$62,626,600

[1] Projects were assigned a sequential identifier by County name

7.1.1.1 Evaluation Criteria

Given the large numbers of projects, six evaluation criteria, as shown in Exhibit 7-2, were identified that could be used to objectively determine the projects with the greatest benefit to the District. The weightings of the criteria were initially assigned to be equal, but are frequently adjusted as a means of performing sensitivity analyses.

EXHIBIT 7-2
Evaluation Criteria

Title	Initial Weighting	Description
Percent of Total Water Demand Provided by the Project (by QWS)	100	The percentage of total demand for a QWS that the recommended project provides
Amount of Water Provided by the Project	100	Total water supply provided by the recommended project
Cost	100	Total cost of the recommended project
Mutually Benefits Another QWS	100	Recommended project that mutually benefits another QWS
Duration of Critical Scenario	100	The duration of the critical scenario associated with each recommended project
Community Impact	100	Minimizes environmental and community disturbance during construction activities

7.1.1.2 Scoring of Projects

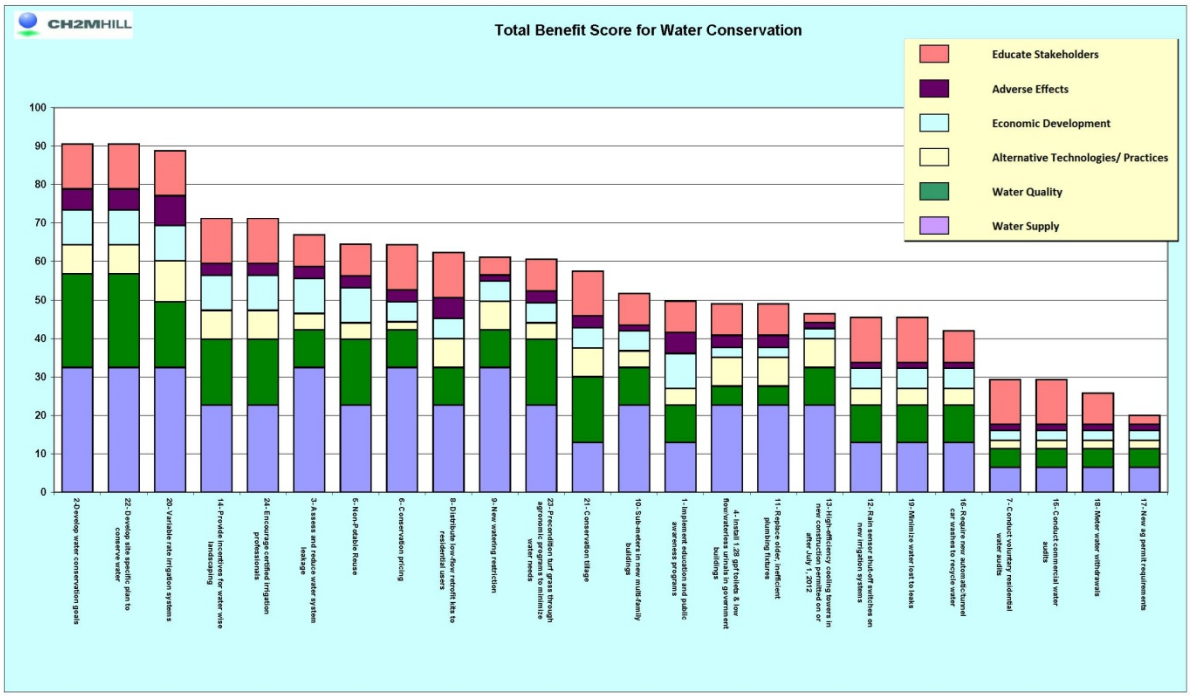
Exhibit 7-3 summarizes scoring guidelines for each criterion that can be objectively scored for each project.

EXHIBIT 7-3
Project Scoring Guidelines

Project Scoring Guidelines						
Score	**Percent of Total Water Demand Provided by Project**	**Amount of Water Provided by Project**	**Cost**	**Mutually Benefits Another QWS**	**Duration of Critical Scenario**	**Community Impact**
10	76-100%	76th percentile	< $150,000	Benefits at 2 QWSs	> 30 days	Minimial Impact (project completed on QWS property)
7	26-75%	26th – 75th percentile	$150,000 - $1,000,000	--	30 days	Moderate Impact (project requires excavation at points (i.e. control valve vault))
3	0-25%	0-25th percentile	>$1,000,000	Benefits 1 QWS	1-3 days	Large Impact (project requires construction for > 200 feet of pipe off QWS property, in roadways)

With the criteria and scoring guidelines set, the next step is to assign scores for each project to calculate a total benefit score for each project. The scores are then summarized to demonstrate to what extent each project supports each criterion. Using this approach a prioritization team can quickly compare both the total benefits of any given project and to what extent each project scored relative to the criteria. Given the local nature of the projects identified in Exhibit 7-1, GEFA did not request the project team to prioritize the recommended projects at this time. If a prioritized list is produced later, it will resemble results used in various regional plans produced under the Georgia State-wide Water Management Plan as reflected below in Exhibit 7-4.

EXHIBIT 7-4
Example Prioritization Results



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8.0 Model Agreements and Summary of Innovative Financing Best Practices

Improving the interconnectivity, resilience and reliability of the District's water supply and delivery infrastructure will require the use of various mechanisms for arranging capital project financing and equitably distributing cost responsibilities. The viability of project financing arrangements will be largely dependent on the anticipated project costs, the number of benefitting parties, and identification of sufficient revenue streams to support the selected project financing option.

8.1 Financing Approaches

Project size, complexity, and the presence of multiple beneficiaries are all relevant in the consideration of financing strategies. In general, projects can be organized into two groups for financing and financial planning purposes:

- **Independent Projects** – These projects are internal to a QWS. As such, the project costs are nearly always limited, and there are effectively no cost allocation issues. While most interconnections could theoretically serve both QWSs, many interconnection projects are driven entirely by the needs of one of the two QWSs, and the realistic potential for utilization to benefit the other party is essentially zero.
- **Shared Projects** – These projects cover multiple QWSs within a local area. Costs may range from relatively minimal amounts to levels that could impact the rates charged by the water suppliers. These projects require allocation of cost responsibilities across more than one beneficiary. These cost allocations will ultimately impact water pricing within and across jurisdictional boundaries.

These two groups of projects may benefit from somewhat different financing approaches and levels of effort, but the financing needs of the projects identified in Section 7 to meet projected emergency demands are likely to be well satisfied by traditional utility system financing options. Current state and regional institutions, in collaboration with water suppliers, have developed similar projects and have arranged to distribute cost responsibilities through various forms of service contracts and intergovernmental agreements.

8.1.1 Independent Projects

Many of the projects listed in Exhibit 7-1 may be readily financed by the individual QWSs. In fact, for projects costing less than a few million dollars, most forms of debt financing (excluding subsidized loans provided by GEFA) are not economical due to transaction costs. Also, the projects that are largely associated with an individual QWS do not present cost allocation issues, because costs are borne only by the QWS involved.

8.1.2 Shared Projects

The vast majority of the projects listed in Exhibit 7-1 that might be considered shared projects also do not present significant project finance challenges. The costs involved tend to be within the normal financing ranges managed by utilities, and in most cases the cost allocations tend to be straightforward. One exception to this general rule may be with respect to arrangements for emergency or standby service as were evaluated in this study, for which there is relatively limited precedent for cost sharing. However, a variety of different arrangements have been used successfully to obtain project financing for locally shared projects. Benefitting providers have typically contributed cash or separately issued debt to finance allocated shares of project costs; however, in some cases separate legal entities with debt issuance authority have been created.

Larger shared projects have more project financing and cost allocation challenges, but few, if any, of the projects identified in Section 7 are likely to encounter such challenges. In the event that such projects were developed in the future, arrangements between multiple public water providers or a consortium of private interests, often with some form of state or regional agency sponsorship, are likely to meet the financing and funding needs.

8.2 Financing Options for the Recommended Projects and Regional Projects

Exhibit 8-1 provides a listing of financing options for the projects identified in this study. While all of the projects are consistent with traditional financing options, some additional options potentially relevant to larger "regional" projects (such as construction of new reservoirs) are also provided in Exhibit 8-1.

In evaluating any of the options listed in Exhibit 8-1, several key attributes should be considered:

- **Sources of Funding** – The sources of funding can have significant implications on the overall cost of capital and the nature of restrictions on the use of proceeds. For example, public agencies generally benefit from the availability of tax-exempt financing instruments, which carry important restrictions to ensure that proceeds are applied for public benefit. Private sector funding sources are typically subject to taxation but may be applied to a broader spectrum of project development options. Specific government actions to support financing, whether grants or specialized forms of taxation, typically impose very specific requirements on the application of funds.

- **Interest Rates/Cost of Funding** – The different sources of financing generally imply different costs of capital. Funding relatively low-cost interconnection projects primarily through water providers' fund balances or current revenues is undoubtedly the least expensive method of financing these projects. Non-traditional public options (e.g. SPLOST) that are effectively different forms of taxation also avoid interest costs, though there are significant administrative and transactions costs associated with these options. On the other end of the spectrum, taxable privately placed financing will typically impose relatively higher costs of capital.

- **Financing Period/Term** – In general, project financing will be completed before the end of the useful life of the installed assets. The resultant intergenerational equity impacts may be relatively insignificant for low-cost projects, but become an important consideration for larger scale investments. Financing periods are effectively non-existent for some of the interconnection or small independent projects that may be financed with current assets, while debt financing typically spreads project costs over a 20- to 30-year time frame. Differences in financing periods across debt instruments may have material impacts on water sales pricing and may be an important consideration in defining a feasible project debt portfolio.

- **Security Provisions** – For projects involving debt, a variety of considerations relate to managing the risks attendant in lending money over an extended period of time. These considerations do not prevail for cash-funded projects or those supported by non-traditional tax measures, and may be all the more acutely considered in private sector project developments. Security provisions relate, for example, to whether the debt obligations are insured or are supported by debt service reserve funds, and how supporting revenues are pledged.

In arranging project financing, it is critically important to use funding options with attributes that best align with the specific characteristics of the project. For most of the projects identified in this study, relatively simple, traditional financing approaches will limit water supplier indebtedness and minimize life-cycle project costs. For larger projects, a number of non-traditional and innovative options, including engagement of the private sector, may be employed to address long-term regional water supply challenges.

In conclusion, there is a broad spectrum of financing options available for financing water supply projects that may increase the interconnectivity, reliability and redundancy of systems throughout the District. Most of the

projects identified as part of this study do not represent particularly substantial resource investments and may be readily financed with available, traditional instruments. Public sector water financing in Georgia is further enhanced with quality state and regional agencies (e.g. GEFA) experienced in arranging financing for relatively low-cost projects. In addition, water suppliers in the District are experienced in accessing the nation's robust municipal finance markets. While there may be new rules established to encourage or enhance a greater focus on water supply reliability, financing of the projects recommended to meet the goals of the WSIRRA is not expected to be a particularly significant challenge.

EXHIBIT 8-1
Funding Options Summary

Funding Option	Key Attributes	Relative Advantages	Relative Disadvantages	Timing and Applicability	Potential Legal Considerations
Traditional Public Options					
Federal or State Grants	No project developer re-payment Limited eligibility focused on specific project types - Applications, administrative costs	"Free money" – lowest financial impact on local beneficiaries Facilitates / subsidizes projects fulfilling federal and state policy objectives	Unavailability, especially in current economic and political climate	Relatively limited project costs for interconnections may obviate need for grants. Grants could help address regional water supply limits	N/A
Subsidized Low-Interest Loans	Project developer re-payment over (typically) 20-year loan periods Limited eligibility focused on specific project types - Applications, administrative costs	Generally lowest available utility rate impact on local beneficiaries Distribution of repayment over (portion of) asset life – enhancing intergenerational equity Facilitates / subsidizes projects fulfilling federal and state policy objectives	Potential decline in availability, especially in current climate	Proven mechanism for funding interconnection-type projects	Multi-jurisdictional lending requires agreement between parties to borrowing
Current System Revenues / System Equity	Cash payment of project cost by developer, typically from current revenues or reserves Available for any prudent project – employed at utility / project developer's discretion No applications, administrative costs	Lowest cost of project development – no costs of financing (except opportunity costs) Establishes rate base on which returns are earned in regulated setting	Utility rate / fee impacts may be pronounced Intergenerational inequities for long-lived capital assets	Relatively limited project costs for interconnections may make this the preferred option in most cases	N/A
General Obligation or Revenue Bonds – Tax Exempt	Project developer re-payment over (typically) 20-30 year bond periods Available for projects for which financial feasibility may be demonstrated Requires at least pledge of municipal tax (General Obligation) and / or system (revenue) proceeds Further security via insurance / sureties	Mitigates near-term utility rate / fee impact on local beneficiaries due to relatively low tax-exempt cost of financing Fixed and variable rate obligations enable risk management in portfolio - Intergenerational equity	Exposure to vagaries of municipal bond market / rating agencies / IRS arbitrage restrictions May require voter approval	Proven mechanism for funding interconnection-type projects Typical 30-year repayment period better aligned to reservoir development among debt options	Multi-jurisdictional lending requires agreement between parties to borrowing
Impact Fees / System Development Charges	Cash payments by customers to systems for growth-related capacity. Typically assessed at time of development State laws govern methodologies for calculation, stewardship of revenues, etc.	Form of system equity financing – low cost by limiting costs of financing Growth pays for itself	Limited to growth-related capacity – and subject to housing market volatility Typically one component of financing package	Constrained to financing "growth-related improvements" – not available to address system deficiencies	N/A
Commercial Loans	Typically relatively shorter term (5-10 years) Atypical for bank lending: application processes	Ready availability in limited amounts (without voter approval) Potentially lower transaction costs	Higher cost of financing than tax-exempt options Limited availability for large projects	Generally employed for stand-alone projects rather than interconnection-type projects	N/A
Commercial Paper (Tax-Exempt)	Project developer re-payment via remarketing of 90-270 day notes – ultimately converted to long-term instrument Requires establishment of Line of Credit with associated administrative costs and securities	Mitigates near-term utility rate / fee impact on local beneficiaries due to relatively low tax-exempt cost of financing Enables tailoring of timing and amount of long-term debt to actual CIP costs May not require voter approval	Remarketing – extends overall period and often cost of financing Exposure to vagaries of municipal bond market / rating agencies / IRS arbitrage restrictions	Individual interconnection projects likely do not require interim / bridge financing May be a component of reservoir development financing package	Multi-jurisdictional, short-term lending requires agreement between parties to borrowing and arrangements for conversion to long-term instruments

EXHIBIT 8-1
Funding Options Summary

Funding Option	Key Attributes	Relative Advantages	Relative Disadvantages	Timing and Applicability	Potential Legal Considerations
Others	Include leases, certificates of participation, special assessments	Provide funding support for projects that benefit limited number of customers or end uses	Generally used for relatively small projects conveying localized benefit	N/A	N/A
Non-Traditional Public Options					
Special Purpose Local Option Sales Tax (SPLOST)	Requires legislative approvals / referendum Limited term, restricted purposes	May distribute burden over larger (e.g., regional) indirectly benefiting population May be deductible on federal taxes	May "crowd out" local government taxing capacity for projects for which rates / fees may not be imposed Regressive tax burden on lower incomes	Not applicable for limited cost interconnection project May be a component of reservoir development financing package	Taxing authority required as well as (potentially multi-jurisdictional) tax assessment and collection provisions
Tax Increment Financing	Authority by legislation Aligned to tax base increase via development of designated area	Distributes revenue burden over directly benefiting population May be deductible on federal taxes	May "crowd out" local government taxing capacity for projects for which rates / fees may not be imposed Risk of tax base under-projections		
Dedicated Fees	Authority by legislation Fee for dedicated purposes defined in legislation	Distributes revenue burden over more general population Ease of public understanding	Direct fees are a re-packaging of rates at added administrative costs Indirect fees strain nexus of fees paid and services provided		
Water Infrastructure Trust Fund	Permanent allocation of federal/state tax revenues to designated purpose Proceeds placed in dedicated fund and distributed by application	Ensures dedicated funding source for water resource investments	Potentially inefficient redistribution of local resources Contemplates institutionalized subsidization of under-priced services	Not applicable for limited cost interconnection project Could be a component of reservoir development financing package	As envisaged by advocates, would require federal legislation Similarly, if developed on a state-wide basis, would require similar legislation as well as designation of administrative authority
Private Sector Participation					
Public-Private Partnerships (PPP)[1] Design, Build, Finance Design, Build, Operate, Finance (Concession) Asset Transfer	Leverage potential synergies of integrated delivery and private sector efficiencies Placement of water financing is in competition with other investment opportunities High transaction costs involved in initial structuring imposes demand for deal volume	Public entity financials Limit bonded indebtedness Release existing sources of capital for other uses Provide new source of capital at market-based costs Control / risk transfer Cost savings / innovation	Requires project delivery cost savings to overwhelm higher costs of capital to achieve net cost savings Requires more involved and structured procurement and contracting processes Requires transfer of control over selected aspects of system development, operation and financing	Not applicable for limited cost interconnection project Could be a component of reservoir development financing package	Legislative measures have / could be implemented to address a variety of institutional barriers ranging from restrictions on procurements using PPP options to retaining eligibility for tax-exempt financing of public portion of PPP financing obligations (e.g., "commingling of financing sources")

Notes:

[1] Public-Private Participation (PPP) options, as a class, represent the greatest opportunity for "innovative financing" for delivery of (generally large scale) water infrastructure projects. To date, the primary barriers to these options have been the relative costs of capital for private equity investment, legal constraints on procurement and partnering practices, and the relative complexity of PPP contracting requirements. Private sector participation in large-scale infrastructure investments could be facilitated by amending current legislation to address project-financing constraints (as opposed to procurement/ partnering) challenges and streamlining or providing uniform contractual and financial terms for a PPP procurement (e.g. develop selected "standard" contract terms and conditions, address private equity "deal volume" requirements, issuer/ guarantor of debt instruments for public component of comingled (e.g., private equity / public debt) project financings).

8.3 Cost Allocation Options

This section summarizes some of the issues related to the allocation of costs associated with interconnections between water utilities. Specific cost allocation solutions for any of the projects identified may vary, so potentially useful allocation concepts are introduced and discussed in terms of relative advantages and disadvantages. This allows an appropriate solution to be developed that addresses each project's unique requirements and the needs of the individual QWSs. Additionally, this section includes an illustration of a cost allocation "decision tree" to suggest a logic sequence for future use in considering new or different types of cost allocation models as projects become relevant.

8.3.1 Cost Allocation Concepts

Obviously there are differences in the treatment of costs for the two types of projects discussed earlier (i.e., independent and shared). The costs of projects that benefit solely one QWS should be borne by that system. The costs of projects that benefit more than one QWS must be allocated to all of the benefiting systems.

This section is primarily concerned with the allocation of project costs for the types of shared projects being driven by the WSIRRA. The focus here is primarily on cost allocation to support new projects. Existing interconnection and reliability assets have already been planned for, designed and constructed; thus, it is presumed that these costs are already being recovered under existing agreements and cost allocation patterns.

Recognizing key differences in the types of costs being considered is helpful in appropriately allocating costs. Operating and capital costs are different, and fixed and variable costs are different. These and other attributes may suggest different cost allocation or cost recovery approaches in some circumstances.

The experiences of utilities currently utilizing assets of benefit to more than one system indicate that multiple solutions are available. A wide variety of existing terms regarding rates and cost sharing are currently in use between utilities in the region. In some cases, base charges and volumetric components are applied, while in other cases the only charge is volume-based when usage occurs. In yet other cases a standard retail rate schedule is utilized or an average of rates for each utility is used.

This variety in the solutions reached by utility managers suggests that many non-cost factors may be relevant when two utilities agree on a cost allocation procedure. This is not surprising given the wide variety of types and utilization of interconnections. In some cases, utilities rely on neighboring utilities for all or a large portion of their water supply on a regular basis, while at the other extreme, some interconnections may exist for emergency support and never have been used. Elaborate cost allocation procedures are applicable in some cases, while in other cases, very simple solutions are employed. The appropriate level of effort is influenced by factors such as the magnitude of the costs involved; the long-term relationship between the utilities; the involvement of other units of local government; the rate of growth of each service area; the presence or lack of reliable water supply; the financial condition of each utility; and the local economic conditions in each service area.

A fundamental consideration in cost allocation is the ability to allocate costs to reflect the behaviors or needs that led to the cost being incurred. The attempt is made to associate costs with the need for facilities or services as a means of working toward an equitable allocation of costs. This objective is foundational in the water industry, and is generally seen as contributing to an efficient utilization of resources as consumers are informed directly or indirectly through prices or cost allocations of the implications of their actions.

This objective is tempered with a number of other objectives including, among others, the ability to generate sufficient revenues to cover the full costs of the project in question; the minimization of administrative costs, including implementation costs; the ease of communicating with stakeholders; the reliability of the resulting revenue stream and concurrent implications for funding; and the affordability of a full cost allocation to the parties involved.

Another important factor in evaluating cost allocation approaches is the availability of data to support the allocation, both in preparation for a project and throughout its life. In this case, the need for reliable water supply can be associated with water consumption or potential demands, and as such, a number of alternative estimation procedures are available. The benefit to a customer or QWS could be measured similarly, restricted only by the quantity of water used or potentially used. Broader measures related to projects or parts of projects determined to have regional benefit could involve such higher level characteristics as population, employment or land area served.

8.3.2 Cost Allocation Examples

Utilities in Georgia and throughout the U.S. have encountered issues and opportunities like those discussed in this section for many years. Their experiences demonstrate a range of potential solutions and confirm the opportunities for mutually beneficial arrangements. Brief summaries of three different situations are provided as examples of positive cost-sharing outcomes on a system-wide basis. Following the three examples of system-wide cost-sharing solutions, several examples of cost allocations for interconnections are presented to illustrate various approaches applied by water systems in the metro Atlanta area.

8.3.2.1 Atlanta – Fulton County Water Resources Commission

The city of Atlanta and Fulton County entered into an agreement in 1986 for the joint construction of a water treatment plant, needed in the north Fulton County area to serve both the city and the county's needs. The agreement runs for a period of 50 years, and it led to the formation of the Atlanta-Fulton County Water Resources Commission. Through the agreement, both entities agreed to share in the expenses of construction and operation of the plant. They also undertook joint planning and development enterprises for the efficient use of the water resources in general.

The Commission is the decision-making body of the joint venture and is formed of seven members: three from the city, three from the county, and one "independent" member not employed by either the city or the county and elected by vote of the other members. The Commission is in charge of formulating plans for site acquisition; developing plans for the construction and use of the facilities; reviewing and updating plans and procedures for additions and improvements; making long-term plans for additional joint efforts in the utilization of the water resources; establishing policies and procedures for the operations and maintenance of the facilities; and establishing the cost allocation to be charged for the water delivered to the respective distribution systems, based on metered water flows and finished water pumping costs.

The financial arrangement and cost allocations were established through the same agreement. Both the city and county agreed to pay for half of all the funds necessary to enable the Commission to perform its responsibilities throughout the period of planning and construction, until appropriate cost allocation formulas could be approved and established. All mutually agreeable capital costs associated with the facilities, including site acquisition, legal services, planning, engineering, and construction costs, were shared equally by the city and county. Furthermore, the agreement established that the cost of any additions and improvements would not be undertaken until it was approved by both parties. The city and county agreed upon certain reimbursements and credits, based on payments already made by the city towards the land and other expenses.

Once the facilities were constructed, it was agreed that the city and county would jointly own the land, treatment plant, intake, raw water lines, and raw water storage reservoirs on a 50-50 basis. Each entity owns and is entitled to distribute 50 percent of the total supply of water treated by the plant, or 50 percent of the capacity, whichever is greater. If either entity exceeded the 50 percent share needs, the agreement provides for the possibility of short-term agreements to deal with the excess share.

The monthly operating costs are allocated on the basis of pro-rata share of the water delivered to each party, as determined by the monthly meter readings. Each entity is billed monthly by the Commission. In addition to the

monthly operating costs, the entities established a depreciation reserve account, funded monthly by the amount equal to the monthly depreciation expense, to be used only for renewal and/or replacement expenses.

This is an illustration of a much more substantial relationship than might be required for most of the improvements identified in this project, but it does confirm the ability of two units of local government to collaborate successfully on a large and complex undertaking.

8.3.2.2 Anderson Regional Joint Water System, South Carolina

The Anderson Regional Joint Water System is a partnership of rural and municipal water districts in upstate South Carolina devoted to providing a high-quality, clean, safe, reliable and economical flow of treated water to its wholesale customers in Anderson and Pickens Counties. The Joint Water System's Lake Hartwell Water Treatment Plant is supplied by surface water from the U.S. Army Corps of Engineers' 55,000-acre Lake Hartwell Reservoir, which lies along the border of South Carolina and Georgia. Formed in 2000, there were initially three founding members: Belton-Honea Path Water Authority, Big Creek Water District, and Broadway Water District. These three members expanded the partnership to incorporate ten new members in April 2002, and the expanded partnership subsequently purchased and began operating Duke Energy's Lake Hartwell Water Treatment Plant.

The Joint Water System is currently governed by a 15-member Board of Commissioners. Each member of the Board represents a water district or municipality that purchases its water from the Joint Water System. Currently, there are 15 member agencies in Anderson and Pickens Counties, and all except Belton-Honea Path Water Authority and the town of Central receive treated water from the Joint Water System. Clemson University also purchases water from the System, but because of state statute is exempt from membership on the Board. When the Anderson Regional Joint Water System partnership was originally established, all the water districts in the area became special purpose districts, through a special act written in the South Carolina state law to allow for this partnership. Each member received ownership in the water plant in terms of capacity, based on each member's capacity needs.

The members on the Board have voting rights on all issues; however, each member district can carry more or less weight in the voting, depending on the type of issue being discussed. For some issues, each member district carries one vote equally, for other issues there must be a unanimous agreement, and for other issues each member votes proportional to the capacity they own. The original agreement defined the types of issues that require the different voting scenarios.

The Joint Water System borrowed $58.6 million to purchase the water plant from Duke Power, and the initial cash buy-in from each member district was the cash that each member had to front for the debt service reserve, which was proportional to their portion of the capacity owned. After the initial debt service reserve, each member district contributes through the monthly billing. The monthly billing is broken into two components: the volumetric portion is based on the percent of flow taken from the plant, and the capital charge is based on the percent of capacity each member owns (each member's portion of the debt service), plus a 30 percent rehabilitation charge. In addition, those systems north of the plant also contribute to a portion of the extra pumping costs required to serve them. With each new upgrade to the plant, the Joint Water System issues additional debt as needed, and the capital charge increases for each member, based on their portion of the capacity owned in the plant.

This case illustrates the ability of a large number of independent systems to collaborate on a large and complex project for their mutual benefit. Additionally, it illustrates a common pattern in cost allocation, which is to allocate fixed costs according to pre-established capacity requirements, and variable costs according to usage.

8.3.2.3 Upper Oconee Basin Water Authority, Georgia

The Bear Creek Water Treatment and Transmission Facilities were constructed and are owned by the Upper Oconee Basin Water Authority (UOBWA). UOBWA is a public body established under the laws of the state of Georgia in the late 1980s, with the purpose of planning and developing a regional water supply system for its member governments. The members are Oconee, Barrow and Jackson Counties, and the consolidated government of Athens-Clarke County, all located in northeast Georgia. Each member contributed to the cost of constructing the facilities. The member counties purchase treated water from UOBWA on a wholesale basis and provide retail service to their individual customers. Athens-Clarke County only purchases raw water, which feeds its treatment facility.

Two intergovernmental agreements outlined how raw and treated water, and the associated costs, were allocated among the UOBWA members. In addition to the two intergovernmental agreements, the UOBWA issued a Series 1997 Revenue Bond to pay for the construction of the water treatment plant and the Barrow, Jackson and Oconee Counties' share of the raw water reservoir.

A cost allocation method was developed based on the intergovernmental agreements and the Series 1997 Revenue Bond documents. Costs were allocated between treatment and raw water costs, and costs were then further allocated based on entitlement, bond proceeds, bond share, consultant fee share, operations contract share, and use share. In Athens-Clarke County's case, the costs associated with the water treatment plant and the associated revenue bond were not applicable as Athens-Clarke County only participated in the raw water reservoir portion of the project. Exhibit 8-2 below summarizes how the costs were allocated among these various cost categories.

EXHIBIT 8-2
Cost Allocations for UOBWA Bear Creek Reservoir, Treatment, and Transmission Facilities

Method	Athens-Clarke		Barrow		Jackson		Oconee	
	Raw	Treat-ment	Raw	Treat-ment	Raw	Treat-ment	Raw	Treat-ment
Entitlement Share	44.0%	0.0%	19.0%	38.1%	25.0%	42.9%	12.0%	19.0%
Bond Share	0.0%	0.0%	33.9%	39.5%	44.7%	39.8%	21.4%	20.7%
Operations Contract Share	44.0%	0.0%	18.7%	33.3%	18.7%	33.3%	18.7%	33.3%
Athens-Clarke Use Share	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Jackson Use Share	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%
Barrow/Oconee Use Share	0.0%	0.0%	0.0%	By use	0.0%	By use	0.0%	0.0%
Use Share	By use	0.0%	By use	By use	By use	By use	By use	By use

8.3.2.4 Cost Allocations for Interconnections

Many utilities have negotiated agreements to pay for new distribution piping and meters to allow one system to supply water to another. These agreements typically are negotiated when one system has a need for water, usually to supply water to an area that has low pressures or in cases where water can be obtained more economically from other surrounding utilities. The actual sharing of capital costs will be based on whether the improvements benefit only one utility or both.

Several examples of cost allocation approaches for interconnections are summarized below:

- As a wholesale supplier of finished water in the metro Atlanta area, the Cobb County-Marietta Water Authority (CCMWA) provides finished water to eleven public water systems through a large number of connections to CCMWA's network of transmission mains and storage tanks throughout Cobb County. Most of these interconnections are for regular daily water supply; however, some interconnections are for intermittent or emergency use only. With the exception of Cobb County Water System (CCWS), the responsibility of paying the capital costs for the piping connections from the CCMWA transmission system to the purchasers' systems is usually borne by the purchaser; however, if a determination is made that a new connecting pipeline has a mutual benefit for CCMWA, a joint funding agreement is executed based on a negotiated split of total project costs for design, construction management, materials, construction and land acquisition. For example, one of CCMWA's customers needed to add a new interconnection to the CCMWA transmission system to supplement the supply available from existing interconnections; the two entities agreed that the purchasing system would be responsible for the installation costs for the new pipeline to the interconnection point, and would then turn over ownership of the pipeline to CCMWA for long-term operation and maintenance. Alternatively, because CCWS's system provides redundancy for CCMWA's transmission system during system maintenance events, CCMWA and CCWS often share costs in the construction of new connections.

- The Newton County Water & Sewerage Authority (NCWSA) faced occasional pressure problems in portions of its system near the Rockdale County system. NCWSA approached Rockdale County to request several interconnections. Rockdale County had no reciprocal need but readily agreed to NCWSA's request for a one-way supply. A total of eight interconnections were envisioned, mostly using 8-inch pipes. NCWSA performed the engineering and planning, and installed four of the interconnections, including the required backflow preventers. The first four interconnections appear to have provided a sufficient solution to the need for additional water supply, and the remaining four are not anticipated to be constructed. No tap fee was charged by Rockdale County for these interconnections, and no capital costs were paid by Rockdale County. Discussions regarding a usage rate have been held between the two systems on a periodic basis since installation of the interconnections, but no contract has yet been executed. Usage by NCWSA occurs less than once a year, but the interconnection has been of great benefit to NCWSA in addressing short-term water supply issues. Billings from Rockdale County for the usage by NCWSA have not been at a consistent rate, but the variable rate has not been an issue of great concern to NCWSA, as obtaining sufficient water during an emergency has outweighed all other factors.

- An emergency interconnection was built to supply water from the Gainesville water system to the Jackson County Water and Sewerage Authority (JCWSA). Gainesville has an agreement with JCWSA that acknowledges the potential for each party to receive water from the other, but assigns sole responsibility for immediate capital expenses to JCWSA; this cost allocation provision was implemented for this emergency interconnection, with JCWSA paying the capital costs for the project. Because of current hydraulic conditions in the two water systems, water can only be delivered from Gainesville to JCWSA, making JCWSA the benefiting system. The standing agreement includes provisions for setting the rates for water purchased by either party, in the event that this or a future interconnection is able to deliver water in both directions.

- Clayton County Water Authority (CCWA) was approached by the City of College Park to provide up to 1.5 mgd of potable water. The City of College Park was the primary beneficiary for this interconnection and proposed to pay for the design and construction of the water line that would run from CCWA's system to the city's. CCWA agreed to this approach as long as CCWA could review the plans and be involved in the construction to ensure that it met CCWA's standards. The City and CCWA also negotiated an agreement on payment for water used each year.

- CCWA and Fayette County have constructed emergency interconnections between their systems in the past. These interconnections were designed and intended to provide one-way supply, with one interconnection providing emergency water supply from CCWA to Fayette County and the other providing emergency supply from Fayette County to CCWA as dictated by the system operating pressures at the tie-in points. In each of these cases, it was agreed that the receiving water system would pay the capital cost of the interconnection. CCWA has an agreement with Fayette and other systems, "It is agreed that additional tie-ins can be requested by either party, and that the cost of piping, valves, meters, meter vaults, etc., shall be negotiated between the parties." This element of the agreement acknowledges a possibly evolving need for new interconnections between the parties, and that a case-by-case negotiation of cost apportionment is warranted in those cases.

This case illustrates the ability of four independent utilities to establish an elaborate allocation of costs suitable to their joint project. The allocations allowed for differing levels of participation and reflected the capacity demands and volumetric use of the parties for various types of costs.

8.3.3 Summary of Cost Allocation Options

Exhibit 8-3 summarizes cost allocation options potentially of value in a variety of situations. It does not prescribe specific solutions, but provides a basis for the involved parties to evaluate potential options. The first section of Exhibit 8-3 addresses the allocation of costs related to potential upgrades or rehabilitation projects related to existing emergency interconnection facilities, and the second section addresses new facilities associated with the WSIRRA.

In conclusion, the representatives of local and state governments have many options, and the widely varying circumstances of each situation suggest that costs will need to be recovered in more than one way.

Some of the key points to be considered include:

- The costs of new facilities can be allocated using a variety of measures; these measures can be categorized as reflecting the need of each system for the improvements in question or the ability of the system to pay for the needed improvements.

- The relative need of each QWS as reflected by the Critical Scenario Deficits estimated as part of this study may represent the most equitable single approach for cost allocation.

- Combinations of approaches could be utilized, particularly if some portion of the improvements in question were determined to provide regional benefit.

Exhibit 8-4 reflects a simplified decision tool demonstrating a series of steps that could be used in evaluating the allocation of costs among QWSs for interconnection projects in the future. The decision tree can be easily modified to incorporate additional allocation or cost factors. Total costs are first segmented into those related to existing facilities (generally, operating, maintenance, and repair costs (OMR)), and those related to new facilities (capital costs as well as OMR). An allowance is then made for potential third party support of major projects to indicate that financial support of particular projects by state or other agencies would be removed prior to the allocation of costs among the participating QWSs. This allowance for third party financial support merely acknowledges the potential for partial funding of projects deemed to serve a particularly important interest beyond that of the QWSs involved. The net costs of a project can then be allocated as a function of projected

water supply deficits or some other measure or mix of measures. The magnitude of the cost burden to each QWS could be estimated, and an example evaluation metric of $1.00 per customer per month is shown to illustrate one potential view of the possible benefit of alternative funding mechanisms for especially large projects.

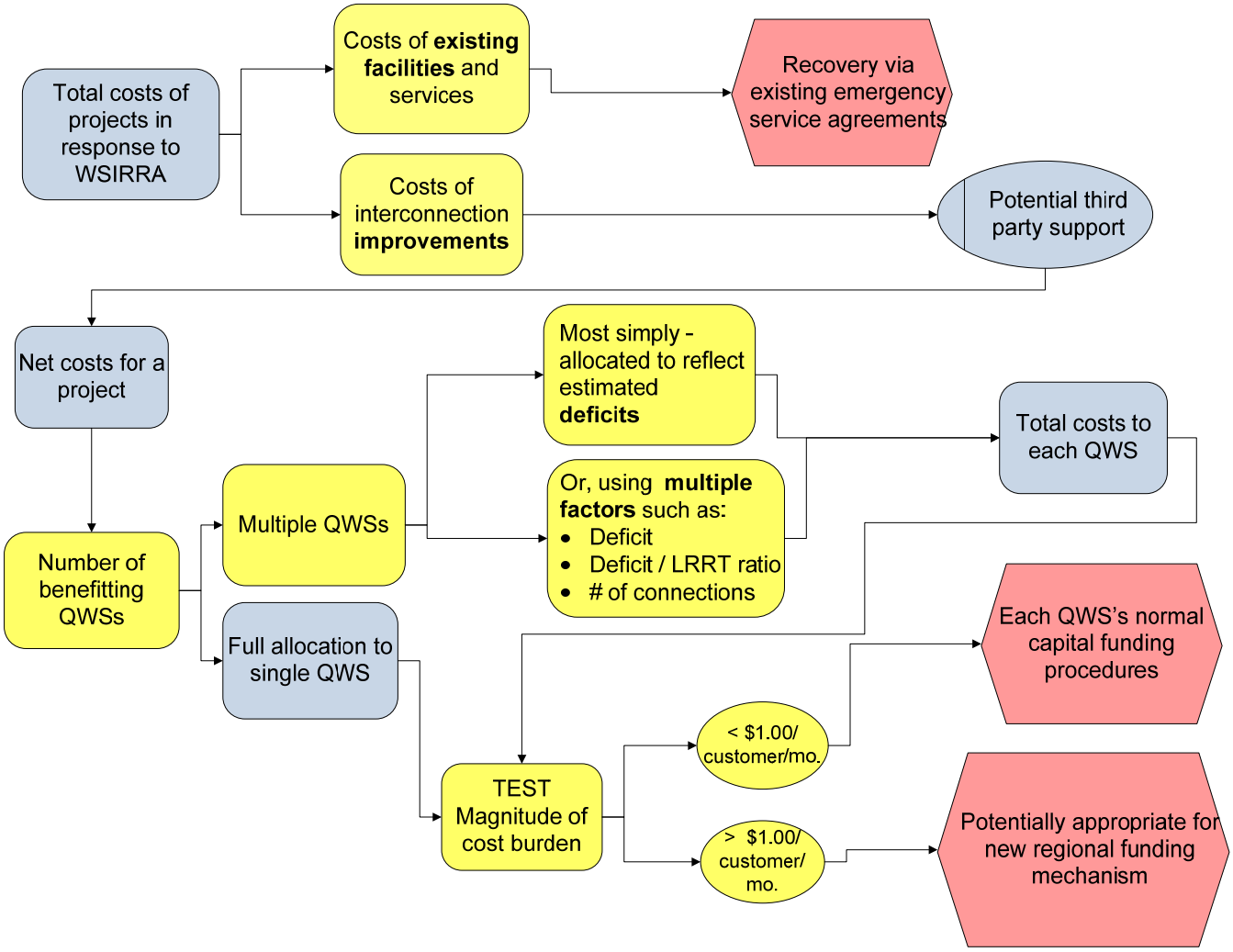
EXHIBIT 8-3
Cost Allocation Options

Type of Costs	Potential Allocation Approach	Relative Advantages	Relative Disadvantages	Comments
Costs of producing / providing water from existing emergency interconnection facilities	Volume of water used through the connection	Usage is often seen as being related to costs; volumetric cost allocations are common	Interconnection usage is not always metered; capacity costs are not always well recovered through volumetric charges; use of an interconnection for peaking purposes can be particularly troublesome if volumetric charges are not well crafted	Not likely to be the best option in cases except where the interconnection is a primary source of supply for one QWS and an existing agreement is in place
	Potential capacity use as measured by connection / meter size	Capacity is clearly related to the costs of providing water for emergency usage	Capacity may not reflect burden of actual usage patterns as some interconnections are used for more than emergency water; cost-based capacity allocations may be significantly higher than many utilities are accustomed to paying for emergency capacity	Not likely to be the best option if any periodic use is associated with the interconnection
	New cost-based combination of capacity and volumetric charges	Provides equitable means of recovering costs of providing capacity as well as costs of water production	Negotiation, calculation, and implementation costs of transition to new system	New, cost-based rate structures following cost-of-service principles as outlined in *Principles of Water Rates, Fees, and Charges* published by AWWA help to achieve equity in cost recovery, but transaction and implementation costs may be high
	Any method currently used by the parties	Already accepted and in use; transaction / negotiation costs are minimized	May not fit a common standard for cost allocations	May be the best option for recovery of costs from existing facilities in most cases
Incremental costs of new facilities associated with WSIRRA	Volume of water used through the interconnection	Usage is often seen as being related to costs; volumetric cost allocations are common	Interconnection usage is not always metered; capacity costs are not always well recovered through volumetric charges; use of an interconnection for peaking purposes can be particularly troublesome if volumetric charges are not well crafted; may not reflect cost drivers for WSIRRA improvements	Not likely to be the best option in many cases
	Potential capacity use as measured by interconnection / meter size	Capacity is clearly related to the costs of providing water for emergency usage	Capacity may not reflect burden of actual usage patterns as some interconnections are used for more than emergency water; cost-based capacity allocations may be significantly higher than many utilities are accustomed to paying for emergency capacity; may not reflect drivers for WSIRRA improvements	Not likely to be the best option if any periodic use is associated with the interconnection
	New cost-based combination of capacity and volumetric charges	Provides equitable means of recovering costs of providing capacity as well as costs of water production	Negotiation, calculation, and implementation costs of transition to new system	New, cost-based rate structures following cost-of-service principles as outlined in *Principles of Water Rates, Fees, and Charges* published by AWWA help to achieve equity in cost recovery; cost-based rate structures may be especially appropriate in cases of significant new investment
	Any method currently used by the parties	Already accepted and in use; transaction / negotiation costs are minimized	Current cost allocation methods did not anticipate WSIRRA improvements and likely would not equitably allocate these costs	Not likely to be the best option in cases except where new WSIRRA-related investment is *de minimis*
	Population served by the QWS	May reflect system size; could be said to reflect system need in some cases; could reflect system funding ability in some cases	Does not account for non-residential usage; does not reflect capacity or volumetric utilization of the interconnection; potentially seen as punishing prepared systems; does not reflect cost drivers for WSIRRA improvements	Subject to the stated disadvantages, population served by the QWS could be a potential method of allocation for a portion of the costs of regional interconnection projects if such projects were determined to be of region-wide benefit
	Population served by the interconnection	May reflect capacity associated with the interconnection; could reflect need associated with the interconnection; could reflect system funding ability in some cases	Does not account for non-residential usage; does not reflect capacity or volumetric utilization; potentially seen as punishing prepared QWSs; does not reflect cost drivers for WSIRRA improvements	Not likely to be the best option in many cases

EXHIBIT 8-3
Cost Allocation Options

Type of Costs	Potential Allocation Approach	Relative Advantages	Relative Disadvantages	Comments
Incremental costs of new facilities associated with WSIRRA (Continued)	Total number of customers	May reflect system size; could be said to reflect system need in some cases; could reflect system funding ability in some cases	Does not reflect capacity or volumetric utilization of interconnection; potentially seen as punishing prepared QWSs; does not reflect cost drivers for WSIRRA improvements	Subject to the stated disadvantages, total number of customers could be a potential method of allocation for a portion of the costs of regional interconnection projects if such projects were determined to be of region-wide benefit
	Total annual system usage	Reflects system size; captures non-residential usage; could be said to reflect system need in some cases; could reflect system funding ability in some cases	Does not reflect capacity or volumetric utilization of interconnection; potentially seen as punishing prepared QWSs; does not reflect drivers for WSIRRA improvements	Subject to the stated disadvantages, total annual QWS usage could be a potential method of allocation for a portion of the costs of regional interconnection projects if such projects were determined to be of region-wide benefit
	Maximum monthly usage	Reflects system size; reflects seasonal demands; could be said to reflect system need in some cases	Does not reflect capacity or volumetric utilization of interconnection; potentially seen as punishing prepared QWSs; does not reflect drivers for WSIRRA improvements	Not likely to be the best option in many cases
	Relative estimated critical supply deficits	Reflects relative need as estimated in this study; could be adjusted to reflect multiple points of connection if appropriate	May result in allocation of costs that is beyond the ability of some QWSs to bear without significant revenue enhancement	Likely the best single option for allocation of these costs in many cases
	Relative ratios of critical deficits to Long Range Reliability Targets	Reflects relative need as estimated in this study; could be seen as recognizing planning and investment by comparatively prepared QWSs; could be adjusted to reflect multiple points of interconnection if appropriate	May result in allocation of costs that is beyond the ability of some QWSs to bear without significant revenue enhancement; does not reflect drivers for WSIRRA improvements	Potentially of use in combination with other allocation approaches
	Annual revenues	Reflects system size and financial capacity; could minimize cost burden on smaller, less financially strong QWSs	Does not reflect capacity or volumetric utilization of interconnection; potentially seen as punishing prepared QWSs; does not reflect drivers for WSIRRA improvements	Not likely to be the best option in many cases
	Cash balances	Reflects system size and financial capacity; could minimize cost burden on smaller, less financially strong QWSs	Does not reflect capacity or volumetric utilization of interconnection; potentially seen as punishing prepared QWSs; does not reflect drivers for WSIRRA improvements	Not likely to be the best option in many cases
	Credit rating	Reflects system size and financial capacity; could minimize cost burden on smaller, less financially strong QWSs	Does not reflect capacity or volumetric utilization of interconnection; potentially seen as punishing prepared QWSs; does not reflect drivers for WSIRRA improvements	Not likely to be the best option in many cases
	Any form of regional allocation beyond the specific QWSs in question	Could reflect a region-wide benefit of increasing interconnectedness among QWSs	Does not reflect capacity or volumetric utilization of interconnection; potentially seen as punishing prepared QWSs; does not reflect drivers for WSIRRA improvements; may require legislative or other authority to impose costs on QWSs not participating in specific improvements	May be worth considering for a portion of costs, perhaps administrative and program management costs if a larger program than is currently envisioned were to be adopted

EXHIBIT 8-4
Model Decision Tree



8.4 Model Intergovernmental Agreement

Intergovernmental agreements for sharing and pricing of water during emergency situations are unique and will vary depending on the type of project and the systems or entities involved. Crafting a successful intergovernmental agreement will involve a number of policy decisions, which also will vary according to the governmental entities involved. However, there are key issues common to all intergovernmental agreements that are integral to the success of these agreements. Addressing these issues of governance and financial and technical issues in the agreement will minimize the potential for legal disagreements between the participating governmental parties.

A Model Intergovernmental Agreement for Emergency Water Interconnection System is provided at the end of this section as Exhibit 8-5. It assumes that the parties will share water in emergency situations via a physical interconnection between their distribution systems. While the type of project may vary, parties can use this Model Intergovernmental Agreement as a tool to facilitate discussion on drafting the specific intergovernmental agreement that best meets their needs.

This section sets out a list of topics that should be addressed by the parties during the drafting of the intergovernmental agreement and addresses the general issues surrounding each topic.

8.4.1 Governance

Generally, the recitals of the agreement between various parties set forth the legal authority permitting the parties to enter into the agreement. Since the intergovernmental agreements at issue deal specifically with the sharing and pricing of water during emergency situations for QWSs in the District, the WSIRRA (O.C.G.A. § 12-5-200, et seq.) should be addressed. As defined by the WSIRRA, "Qualified Water Systems" considered in this study are limited to public water systems that are operated by a city, county or water authority. Therefore, the examples discussed in this section involve only intergovernmental agreements.

Example:

"WHEREAS, the General Assembly finds that it is in the best interests of the state of Georgia for public water systems in the Metropolitan North Georgia Water Planning District to evaluate their withdrawal, treatment, and distribution systems and to take proactive measures to reduce the risk of catastrophic interruptions of water service during emergencies as set forth in O.C.G.A. §12-5-200(2); and,"

City and county governmental entities need statutory authority to enter into contracts. This is because of the general rule that local governments may not enter into a contract that lasts longer that the government's term of office. One council may not bind itself or its successors (O.C.G.A. § 36-30-3(a)). However, the Intergovernmental Contracts Clause found in Article IX, Section III, Paragraph I(a) of the 1983 Georgia Constitution provides an exception to that rule and allows political subdivisions of the state to contract with one another or with other public agencies provided that the contract does not exceed 50 years. This exception does not give authority for these governmental entities to enter into any kind of agreement that they want to. The agreement must be for the provision of services or for the use of facilities or equipment that the parties are authorized by law to undertake. See, City of Decatur vs. DeKalb County, Ga. (2011) (Georgia Supreme Court Case No. S11A0354, decided July 5, 2011). City and county governments are authorized by law to provide services for "[d]evelopment, storage, treatment, purification, and distribution of water", 1983 Georgia Constitution Article IX, Section II, Paragraph III(7). Thus, city and county governments are permitted by law to contract for the provisions of services or for the use of facilities or equipment for the sharing of water.

Examples:

"WHEREAS, Article IX, Section III, Paragraph I(a) of the Georgia Constitution authorizes, among other things, any county, municipality or other political subdivision of the state to contract, for a period not exceeding 50 years, with another county, municipality or political subdivision or with any other public agency, public

corporation or public authority for joint services, for the provision of services, or for the provision or separate use of facilities or equipment, provided that such contract deals with activities, services or facilities which the contracting parties are authorized by law to undertake or to provide; and,"

"*WHEREAS, Article IX, Section II, Paragraph III(7) of the Georgia Constitution authorizes, among other things, any county or municipality to provide for the development, storage, treatment, purification, and distribution of water; and"*

If the "qualified system" contracting party is a local water authority, the recitals of the agreement should set forth the legal authority permitting the local authority to contract. "[T]he term "local authority" means an instrumentality of one or more local governments created to fulfill a specialized public purpose or any other legally created organization that has authority to issue debt for a public purpose independent of a county or municipality, regardless of name; provided, however, that the term "local authority" does not include a state authority. A local authority may have been created by local constitutional amendment, general statute or local law."(O.C.G.A. § 36-80-17(a)).

Example:

"WHEREAS, the Local Water Authority is organized and established under the provisions of [local constitutional amendment, general statute, or local law], for the purpose of constructing and operating a water supply distribution system serving water users within the area described in the plans now on file in the office of the Local Water Authority; and, "

8.4.2 Purpose

The agreement should address why the parties are entering into the agreement, including the spirit and intent of the agreement, which can be set forth in the recitals or as a provision in the agreement.

Examples:

"WHEREAS, the City and County agree that the establishment of a potable water interconnection between the two parties is in the best interest of their respective communities and that to promote the establishment of such a system, all points of connection constructed between the City system and the County system shall be treated as emergency interconnections and constructed so as to allow the flow of water from either system to the other; and"

"WHEREAS, the City and the County desire to enter into an agreement for an emergency water interconnection system, whereby both parties agree to coordinate and cooperate with each other and agree to establish the terms and conditions under which the systems can be physically connected and water made available to each other during times of emergency, as more specifically set forth below. "

"1. <u>Purpose</u>. This is an Agreement for the reciprocal sale and purchase of available potable water by and between the City and County during emergency water conditions for the mutual convenience of the parties. All of the foregoing recitals are true and correct and are made a part of this Agreement as if fully set forth herein."

8.4.3 Definitions

Terms and corresponding definitions should clearly be set out in the agreement. Of particular interest is the definition of "emergency," which should be defined to include those parameters set forth in O.C.G.A. § 12-5-201. Other terms and corresponding definitions may be dictated by the type of project and its financial and technical issues.

Examples:

"2. <u>Definitions</u>. For purpose of this Agreement, the following definitions shall apply:

(a) "Available Potable Water" shall mean a surplus of potable water not immediately needed by the Selling Party.

(b) "Emergency Water Condition" shall mean a shortage of potable water to meet the essential water needs of the Requesting Party's customers that threatens their health, safety and welfare.

(c) "Essential Water Needs" shall mean the minimum amount of water needed for residential and commercial means for food processing, drinking, toilet flushing, fire fighting, hospital use, and critical asset use and a portion of the system's unaccounted for water as defined in O.C.G.A. §12-5-201(4).

(d) "Requesting Party" shall mean that party which desires to purchase potable water from the other.

(e) "Selling Party" shall mean that party which has Available Potable Water to sell to the Requesting Party."

8.4.4 Procedures

The agreement should address the processes and procedures for parties to follow in a water emergency.

Examples:

"3. Disruption of Potable Water Supply. Whenever either City or County experiences an Emergency Water Condition and desires to purchase Available Potable Water from the other, the Requesting Party shall notify the Selling Party of the Emergency Water Condition and request Available Potable Water be transferred to the Requesting Party for a limited period, as determined by mutual agreement. The Selling Party shall respond as soon as possible to the request by advising the Requesting Party of the quantity of Available Potable Water.

4. Notification of Emergency Water Conditions. The City water system director, by whatever name called, or his on-call designee, and the County water system director, by whatever name called, or his on-call designee, shall immediately notify the other when Emergency Water Conditions develop and request temporary water service from the other. Such notice shall include a description of the emergency and expected duration.

5. Utility Staff Responsibilities. In the event that water is needed by City or County, each parties' Utility Department will be responsible for operating all of the valves necessary to permit water to be sold from one to the other; and each utility will be responsible for returning their valves to the original closed position once the temporary water service event is completed."

8.4.5 Amount to Supply

The agreement should address how much water the parties agree will be supplied in the event of an emergency.

Example:

"6. Rate of Supply. The Selling Party shall not be required to draw water in excess of any Water Use permits, nor shall the Selling Party be required to provide more than its Available Potable Water; and the Selling Party shall not be liable to the Requesting Party or its customers for any interruptions or water service provided hereunder. The parties shall be obligated to supply water pursuant to this Agreement only to the extent that doing so does not prejudice the ability of the Selling Party to fulfill its obligations to its customers and other entities with contracts with the Selling Party."

8.4.6 Pricing

The cost allocation concepts discussed in the prior sections give various examples of how allocation of costs associated with interconnections can be addressed by the parties in the agreement. The Model Intergovernmental Agreement presented here uses a volume of use approach to pricing and contemplates a change in rates; however, other approaches to pricing, as described previously, could be instituted with the concurrence of both parties. Setting the cost allocation in the agreement will require a mixture of accounting, business and political skills to arrive at a pricing agreement that meets both business and political criteria.

Example:

"7. Water Supply Charges. Water supplied by either party per this Agreement and distributed through the point(s) of interconnection shall be charged at the then current lowest retail residential water rate, regardless of the number of gallons used, as set forth in the Selling Party's rate ordinance or resolution. The parties will not be required to pay each other impact or connection fees for the carrying out of this Agreement.

If the contracting party is a local water authority, the enabling legislation, i.e., the local constitutional amendment, general statute or local law that created the water authority, should be reviewed to determine what powers the local water authority has. See, City of Jonesboro v. Clayton County Water Authority, 136 Ga. App. 768 (1975) (Enabling Act of water authority gave it power to set rates; however, it did not give it power to arbitrarily revise rates after it had contracted for specific rates). The agreement also should address the requirements of O.C.G.A. § 36-80-17 as to contracts specifying rates, fees or other charges to be charged and collected for water utility services provided by the local authority. This Code Section allows the governing body of any local authority which is authorized to provide electric, natural gas or water utility services to enter into contracts that specify the rates, fees or other charges which will be charged and collected by the local authority for utility services to be provided by the local authority to one or more of its utility customers. However, such contracts are subject to the following conditions and limitations:

> "(1) No such contract shall be for a term in excess of 10 years;
>
> (2) Any such contract that is for a term in excess of two years shall include commercially reasonable provisions under which the rates, fees or other charges shall be adjusted with respect to inflationary or deflationary factors affecting the provision of the utility service in question; and,
>
> (3) Any such contract shall include commercially reasonable provisions relieving the local authority from its obligations under the contract in the event that the local authority's ability to comply with the contract is impaired by war, natural disaster, catastrophe or any other emergency creating conditions under which the local authority's compliance with the contract would become impossible or create a substantial financial burden upon the local authority or its taxpayers." (O.C.G.A. § 36-80-17 (b) (1) – (3)).

There is a similar provision authorizing municipalities to execute contracts establishing water rates, which recognizes the power of a local authority providing water utility services to establish rates, where the right or power to specify such rates, fees or charges is otherwise vested by local constitutional amendment, general statute or local law in the governing body of such local authority. However, any such contract is subject to the same three conditions and limitations listed above (O.C.G.A. § 36-30-3(d) (1) – (3)).

Examples:

"(a) Change of Rates. If either City or County proposes any new or amended rate schedule while this Agreement is in effect, provided that any new or amended rate schedule shall be adjusted with respect to inflationary or deflationary factors affecting the provision of the water utility service, notice shall be furnished to the other party prior to the effective date of the new or

amended rate schedule. Thereafter, the new or amended rate schedule shall take effect for purposes of this Agreement beginning in the next billing cycle after the change in rate takes effect. The purpose of this subsection is only to ensure disclosure of rate changes and shall not grant either party a right to appeal any rate increase. The parties hereby agree that, during the Agreement, both parties shall continue to be billed at the lowest retail residential water rate."

"Term. This Agreement shall continue in effect for five (5) years, unless otherwise terminated, as set forth above. Further, this Agreement shall be automatically renewed for five (5) year increments unless either party notifies the other in writing at least one year prior to the termination date. Upon Termination of the Agreement both parties agree to share equally the interconnection removal costs."

"Force Majeure. City and County agree that the Available Potable Water will be continuous during the Emergency Water Condition, except that temporary disruption of service at any time caused by an act of God, fire, strikes, casualties, war, terrorist act, natural disaster, accidents, necessary maintenance work, breakdowns of or injuries to machinery, pumps or pipelines, civil or military authority, insurrections, riot, acts or declarations of government or regulatory agencies other than City or County, or any other cause beyond the control of City or County, shall not constitute a breach of this Agreement; and no party shall be liable to the other or to its customers for any damage resulting from such unavoidable disruption of service."

8.4.7 Project Subject to Intergovernmental Agreement

The project contemplated by the Model Intergovernmental Agreement is a physical interconnection with the parties equally sharing the capital, operating and maintenance costs of the interconnection. As discussed in the prior sections, the available funding and cost allocation options will vary according to the project.

Example:

"8. Physical Interconnection for Emergency Conditions. Within six (6) months of the effective date of this Agreement, City and County shall install equipment that will allow water flow in either direction and will allow an automatic supply to occur to equalize pressure (the "Interconnection"). The parties shall mutually determine the scope of and the plan for maintenance of the Interconnection. The cost of installing and maintaining the Interconnection will be shared equally by the parties. The parties shall mutually develop a protocol for maintenance which includes the manner of and procedure for cost sharing. It is agreed that during normal operating conditions, the Interconnection will be closed and water will be prevented from flowing through the Interconnection."

8.4.8 Meter Maintenance and Ownership Responsibilities

The agreement should have basic language about who will read meters, maintain meters and replace meters, especially if the interconnection will be used on a regular basis to provide water from one system to another. The need for meters on emergency interconnections is not as important, and the use of meters is left to the discretion of the utility systems.

Example:

"9. Metering.

(a) Each party shall install a meter, and each party shall be charged with maintaining, calibrating and reading its meter at its own expense. Annually, or upon written notice by the other party, each shall inspect and test their meter in the presence of a representative of the other party. Copies of these inspections and tests shall be made available from one to the other. No meter

shall be allowed to remain in service that has an error in excess of published American Water Works Association ("AWWA") Standards (or such succeeding standards) at the time of the testing. If a party requests a meter inspection in addition to the annual inspection, and the meter conforms to AWWA standards upon testing, the party requesting the inspection shall pay all inspection and testing costs. In the event that it is determined that the meter is not properly calibrated, then the requesting party shall not be liable for the inspection and testing cost, and the owner of the meter shall immediately take steps to restore the meter to an accurate condition or install a new meter, and credit the requesting party for any overpayment based on all available information as agreed to by the utility staffs of City and County.

(b) The Requesting Party shall read the meter prior to opening the Interconnection. Said meter reading shall be provided to the Selling Party with the notice required in Section 4. When the Interconnection is closed at the end of the Emergency Water Condition, the meter shall be read again by the Requesting Party, which shall immediately notify the Selling Party of the reading."

8.4.9 Water Quality

The agreement should address water quality standards and should include a basic agreement for each party to notify the other in the event of a change in the water treatment process that would affect the quality of water being furnished under the agreement.

Example:

"10. Water Quality. Each party shall provide treated water to the other party at the point of connection to the Interconnection. Treated water must meet the water quality requirements of all applicable regulatory agencies, including the U.S. Environmental Protection Agency and the Environmental Protection Division of the Georgia Department of Natural Resources. Further, if City or County proposes any change(s) to their water treatment process that would affect the water quality chemistry of their finished water while this Agreement is in effect, notice shall be furnished to the other party prior to the effective date of the proposed change(s)."

8.4.10 Termination

The agreement should address early termination of the agreement, both for cause and without cause, and the process for handling disputes arising from early termination of the agreement. The model agreement contemplates the option of resolving any disputes through mediation.

Example:

"11. Early Termination.

(a) Without Cause. If neither party is in breach, either party may terminate this Agreement prior to the expiration of the term by rendering to the other party ninety (90) days notice of early termination.

(b) For Cause. If either party fails to perform each and every obligation of this Agreement, each party reserves the right to immediately discontinue performance of services pursuant to this Agreement, after the party seeking termination has provided written notice of the alleged violation to the breaching party, and the breaching party has failed to cure the breach within thirty (30) days of receipt of notice thereof.

(c) Remedies. Either party to this Agreement, in the event of or act of breach by the other, shall have all remedies available under the laws of the state of Georgia including, but not limited to,

injunction to prevent breach, specific performance to enforce this Agreement, or mediation subject to State law."

8.4.11 Water Conservation Measures

The agreement should address how water conservation measures and restrictions will be handled. The Model Intergovernmental Agreement contemplates a reciprocal approach to this issue.

Example:

"12. Water Conservation. This Agreement shall be subject to all state and federal water conservation regulations. Further, any time that the customers of the Selling Party are under water use restriction and water is being supplied to the Requesting Party, the Requesting Party agrees to impose restrictions at least as strict as those imposed by the Selling Party."

8.4.12 Other Contract Considerations

The agreement may contain other standard contract provisions regarding the enforcement, interpretation and execution of the agreement, as necessary.

EXHIBIT 8-5
Model Intergovernmental Agreement for Emergency Water Interconnection System

MODEL INTERGOVERNMENTAL AGREEMENT FOR EMERGENCY WATER INTERCONNECTION SYSTEM

THIS INTERGOVERNMENTAL AGREEMENT (this "Agreement"), made and entered into as of the ____ day of _____, 20___, by and between CITY OF _____, GEORGIA, a municipal corporation of _____County, Georgia (the "City"), and _____ COUNTY, GEORGIA, a political subdivision of the state of Georgia (the "County").

W I T N E S S E T H:

WHEREAS, City and County each own and operate public water systems in the Metropolitan North Georgia Water Planning District that provide service to their respective customers; and,

WHEREAS, the General Assembly finds that it is in the best interests of the state of Georgia for public water systems in the Metropolitan North Georgia Water Planning District to evaluate their withdrawal, treatment and distribution systems and to take proactive measures to reduce the risk of catastrophic interruptions of water service during emergencies as set forth in O.C.G.A. § 12-5-200(2); and,

WHEREAS, City and County agree that the establishment of a potable water interconnection between the two parties is in the best interest of their respective communities and that to promote the establishment of such a system, all points of connection constructed between the City system and the County system shall be treated as emergency interconnections and constructed so as to allow the flow of water from either system to the other; and,

WHEREAS, Article IX, Section III, Paragraph I(a) of the Georgia Constitution authorizes, among other things, any county, municipality or other political subdivision of the state to contract, for a period not exceeding 50 years, with another county, municipality or political subdivision or with any other public agency, public corporation or public authority for joint services, for the provision of services, or for the provision or separate use of facilities or equipment, provided that such contract deals with activities, services or facilities that the contracting parties are authorized by law to undertake or to provide; and,

WHEREAS, the City and the County desire to enter into an agreement for an emergency water interconnection system, whereby both parties agree to coordinate and cooperate with each other and agree to establish the terms and conditions under which the systems can be physically connected and water made available to the each other during times of emergency, as more specifically set forth below.

NOW, THEREFORE, for and in consideration of the premises and undertakings as hereinafter set forth and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the City and the County DO HEREBY AGREE, as follows:

1. Purpose. This is an Agreement for the reciprocal sale and purchase of available potable water by and between the City and County during emergency water conditions for the mutual convenience of the parties. All of the foregoing recitals are true and correct and are made a part of this Agreement as if fully set forth herein.

2. Definitions. For purpose of this Agreement, the following definitions shall apply:

(a) "Available Potable Water" shall mean a surplus of potable water not immediately needed by the Selling Party.

(b) "Emergency Water Condition" shall mean a shortage of potable water to meet the Essential Water Needs of the Requesting Party's customers that threatens their health, safety and welfare.

(c) "Essential Water Needs" shall mean the minimum amount of water needed for residential and commercial means for food processing, drinking, toilet flushing, fire fighting, hospital use, and critical asset use and a portion of the system's unaccounted for water as defined in O.C.G.A. § 12-5-201(4).

(d) "Requesting Party" shall mean that party which desires to purchase potable water from the other.

(e) "Selling Party" shall mean that party which has Available Potable Water to sell to the Requesting Party.

3. Disruption of Potable Water Supply. Whenever either City or County experiences an Emergency Water Condition and desires to purchase Available Potable Water from the other, the Requesting Party shall notify the Selling Party of the Emergency Water Condition and request Available Potable Water be transferred to the Requesting Party for a limited period, as determined by mutual agreement. The Selling Party shall respond as soon as possible to the request by advising the Requesting Party of the quantity of Available Potable Water.

4. Notification of Emergency Water Conditions. The City water system director, by whatever name called, or his on-call designee, and the County water system director, by whatever name called, or his on-call designee, shall immediately notify the other when Emergency Water Conditions develop and request temporary water service from the other. Such notice shall include a description of the emergency and expected duration.

5. Utility Staff Responsibilities. In the event that water is needed by City or County, each party's Utility Department will be responsible for operating all of the valves necessary to permit water to be sold from one to the other; and each utility will be responsible for returning their valves to the original closed position once the temporary water service event is completed.

6. Rate of Supply. The Selling Party shall not be required to draw water in excess of any Water Use permits, nor shall the Selling Party be required to provide more than its Available Potable Water; and the Selling Party shall not be liable to the Requesting Party or its customers for any interruptions or water service provided hereunder. The parties shall be obligated to supply water pursuant to this Agreement only to the extent that doing so does not prejudice the ability of the Selling Party to fulfill its obligations to its customers and other entities with contracts with the Selling Party.

7. Water Supply Charges. Water supplied by either party per this Agreement and distributed through the point(s) of interconnection shall be charged at the then current lowest retail residential water rate, regardless of the number of gallons used, as set forth in the Selling Party's rate ordinance or resolution. The parties will not be required to pay each other impact or connection fees for the carrying out of this Agreement.

(a) Change of Rates. If either City or County proposes any new or amended rate schedule while this Agreement is in effect, notice shall be furnished to the other party prior to the effective

date of the new or amended rate schedule. Thereafter, the new or amended rate schedule shall take effect for purposes of this Agreement beginning in the next billing cycle after the change in rate takes effect. The purpose of this subsection is only to ensure disclosure of rate changes and shall not grant either party a right to appeal any rate increase. The parties hereby agree that, during the Agreement, both parties shall continue to be billed at the lowest retail residential water rate.

8. Physical Interconnection. Within six (6) months of the effective date of this Agreement, City and County shall install equipment that will allow water to flow in either direction and will allow an automatic supply to occur to equalize pressure (the "Interconnection"). The parties shall mutually determine the scope of and the plan for maintenance of the Interconnection. The cost of installing and maintaining the Interconnection will be shared equally by the parties. The parties shall mutually develop a protocol for maintenance which includes the manner of and procedure for cost sharing. It is agreed that during the normal operating conditions, water will be prevented from flowing through the Interconnection.

9. Metering.

(a) Each party shall install a meter, and each party shall be charged with maintaining, calibrating and reading its meter at its own expense. Annually, or upon written notice by the other party, each shall inspect and test their meter in the presence of a representative of the other party. Copies of these inspections and tests shall be made available from one to the other. No meter shall be allowed to remain in service that has an error in excess of published American Water Works Association ("AWWA") Standards (or such succeeding standards) at the time of the testing. If a party requests a meter inspection in addition to the annual inspection, and the meter conforms to AWWA standards upon testing, the party requesting the inspection shall pay all inspection and testing costs. In the event that it is determined that the meter is not properly calibrated, then the requesting party shall not be liable for the inspection and testing costs, and the owner of the meter shall immediately take steps to restore the meter to an accurate condition or install a new meter, and credit the requesting party for any overpayment based on all available information as agreed to by the utility staffs of City and County.

(b) The Requesting Party shall read the meter prior to opening the Interconnection. Said meter reading shall be provided to the Selling Party with the notice required in Section 4. When the Interconnection is closed at the end of the Emergency Water Condition, the meter shall be read again by the Requesting Party, which shall immediately notify the Selling Party of the reading.

10. Water Quality. Each party shall provide treated water to the other party at the point of connection to the Interconnection. Treated water must meet the water quality requirements of all applicable regulatory agencies, including the U.S. Environmental Protection Agency and the Environmental Protection Division of the Georgia Department of Natural Resources. Further, if City or County proposes any change(s) to their water treatment process that would affect the water quality chemistry of their finished water while this Agreement is in effect, notice shall be furnished to the other party prior to the effective date of the proposed change(s).

11. Early Termination.

(a) Without Cause. If neither party is in breach, either party may terminate this Agreement prior to the expiration of the term by rendering to the other party ninety (90) days notice of early termination.

(b) For Cause. If either party fails to perform each and every obligation of this Agreement, each party reserves the right to immediately discontinue performance of services pursuant to this Agreement, after the party seeking termination has provided written notice of the alleged violation to the breaching party, and the breaching party has failed to cure the breach within thirty (30) days of receipt of notice thereof.

(c) Remedies. Either party to this Agreement, in the event of or act of breach by the other, shall have all remedies available under the laws of the state of Georgia including, but not limited to, injunction to prevent breach, specific performance to enforce this Agreement, or mediation subject to state law.

12. Water Conservation. This Agreement shall be subject to all state and federal water conservation regulations. Further, any time that the customers of the Selling Party are under water use restriction and water is being supplied to the Requesting Party, the Requesting Party agrees to impose restrictions at least as strict as those imposed by the Selling Party.

13. Billing. The Selling Party shall bill on or around the thirtieth (30) day of the month for all metered water sold hereunder during the month. Bills not paid within forty-five (45) days of receipt shall be assessed a one and one-half percent (1-1/2%) per month late charge.

14. Term. This Agreement shall continue in effect for five (5) years, unless otherwise terminated, as set forth above. Further, this Agreement shall be automatically renewed for five (5) year increments unless either party notifies the other in writing at least one (1) year prior to the termination date. Upon termination of the Agreement both parties agree to share equally the Interconnection removal costs.

15. Force Majeure. City and County agree that the Available Potable Water will be continuous during the Emergency Water Condition, except that temporary disruption of service at any time caused by an act of God, fire, strikes, casualties, war, terrorist act, natural disaster, accidents, necessary maintenance work, breakdowns of or injuries to machinery, pumps or pipelines, civil or military authority, insurrections, riot, acts or declarations of government or regulatory agencies other than City or County, or any other cause beyond the control of City or County, shall not constitute a breach of this Agreement; and no party shall be liable to the other or to its customers for any damage resulting from such unavoidable disruption of service.

16. Notices. All notices under this Agreement will be in writing and shall be given only by hand delivery for which a receipt is obtained, or certified mail, return receipt requested. Notices will be deemed given when received by the party for whom intended. Notices will be delivered or mailed to the addresses set forth below or as either party may designate in writing:

If to the CITY:	Mayor Street City, Georgia ZIP
with a copy to:	City Attorney Street City, Georgia ZIP
If to the COUNTY:	Chairman, Board of Commissioners Street City, Georgia ZIP
with a copy to:	County Attorney Street City, Georgia ZIP

17. Entire Agreement. This Agreement constitutes the entire Agreement of the parties and may not be changed or modified except by instrument in writing executed by both of the parties hereto. This Agreement shall supersede any other agreement between the parties which may be in conflict.

18. Legal Prohibition. Neither City nor County shall be required to deliver Available Potable Water under the terms of this Agreement if prohibited by any applicable, federal, state, regional or local statute, rule, ordinance, law, administrative order or judicial decree, or in violation of applicable permits.

19. Applicable Law and Venue. The laws of the state of Georgia shall govern the validity, interpretation, construction and performance of this Agreement; and venue for any suit involving this Agreement shall be within County, Georgia.

20. Binding Effect. This Agreement is binding upon and shall inure to the benefit of the successors or assigns of the parties to this Agreement.

21. Indemnity. Each party hereby agrees to save and hold harmless the other from and against any claims made by third parties for damages resulting from the failure of either party to deliver Available Potable Water meeting all state and federal standards. Each party agrees, at its own expense, to maintain general liability insurance coverage or self insure with standard limits for utility operations during the term of this Agreement to cover all such claims by third parties. When receiving water under this Agreement, the Requesting Party acts in the capacity of owner and operator of a public water system and is solely responsible for compliance with all pertinent regulations and the Selling Party will have no responsibility for said water.

22. No Third Party Beneficiaries. The parties' obligations to deliver Available Potable Water shall run only to each other and shall in no event create any obligation to or duty toward any other party or any customer. This Agreement is for the sole and exclusive benefit of the parties, and shall not be construed to confer a benefit or right upon any third party.

23. Assignment. No party may transfer or assign its rights under this Agreement without the written approval from the governing boards of both parties.

24. Further Documents. The parties shall execute such other and further documents as may be deemed necessary by either party to fulfill the intent of the parties to this Agreement.

25. Time of Essence. Time is of the essence of each and every term, provision and covenant of this Agreement.

26. Captions. All captions, headings, Section and subsection numbers and letters and other reference numbers or letters are solely for the purpose of facilitating reference to this Agreement and shall not supplement, limit or otherwise vary in any respect the text of this Agreement.

27. Counterparts. This Agreement may be executed in several counterparts, each of which shall constitute an original and all of which together shall constitute one and the same instrument.

28. Severability. This Agreement is intended to be performed in accordance with, and only to the extent permitted by, all applicable laws, ordinances, rules and regulations. If any provision of the Agreement, or the application thereof to any person or circumstance, shall, for any reason and to any extent be invalid or unenforceable, the remainder of this Agreement and the application of such provision to other

persons or circumstances shall not be affected thereby but rather shall be enforced to the greatest extent permitted by law.

IN WITNESS WHEREOF, the parties hereto, acting by and through their duly authorized officers, have caused this Agreement to be executed under seals as of the day and year first above written.

CITY OF _____, GEORGIA

_____
Mayor

(SEAL)

ATTEST:

_____
City Clerk

COUNTY OF _____, GEORGIA

_____
Chairman

(SEAL)

ATTEST:

_____
County Clerk

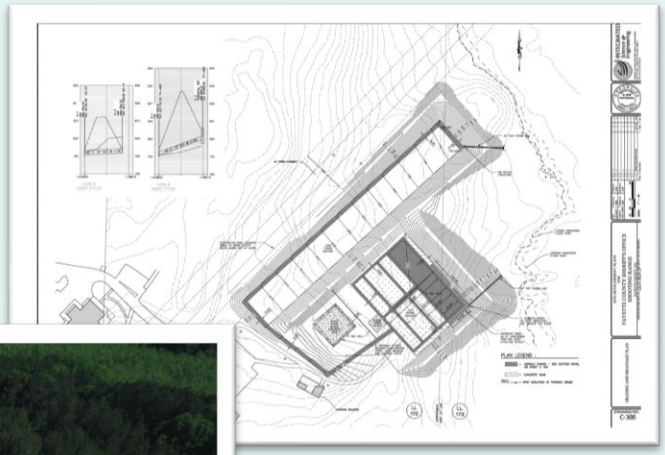
PUBLIC SAFETY TRAINING CENTER

BOARD OF COMMISSIONERS RETREAT

APRIL 5, 2019

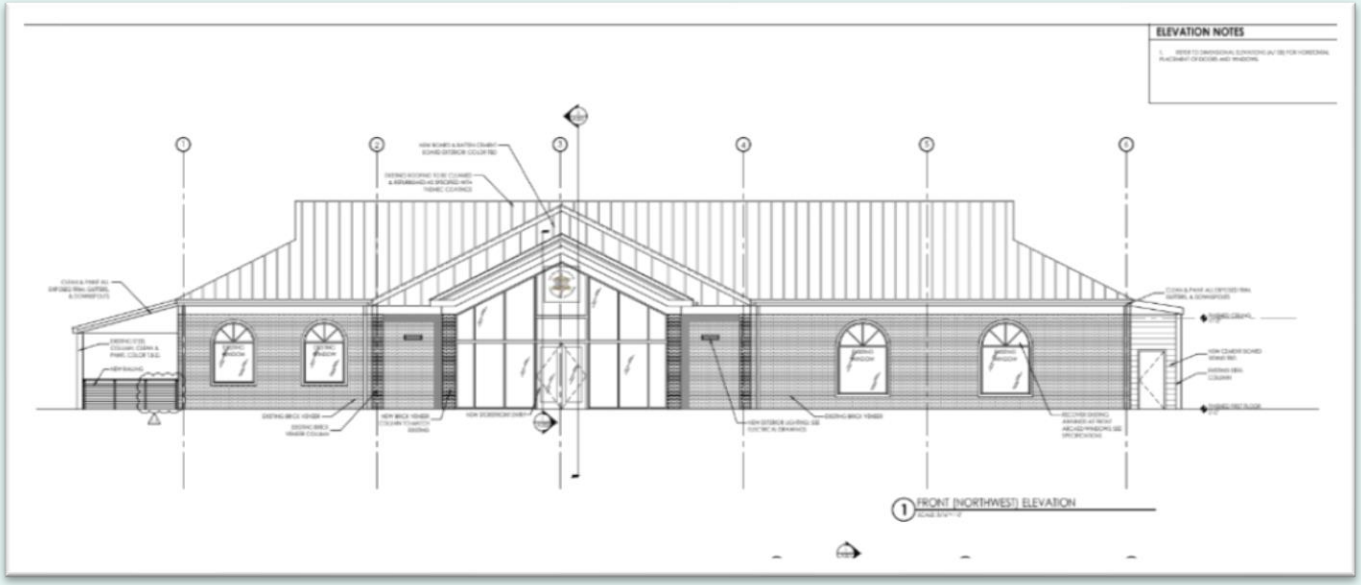
Links Master Plan – Phase I

- Public Safety Training Center design began in 2014
- Master Plan Phase I – Shooting Range was completed in 2017



Links Master Plan – Phase II

- Master Plan
  - Phase II – Training Center building renovation design was awarded to Oak Construction Group in November 2018 for $1.1M



Training Center Building

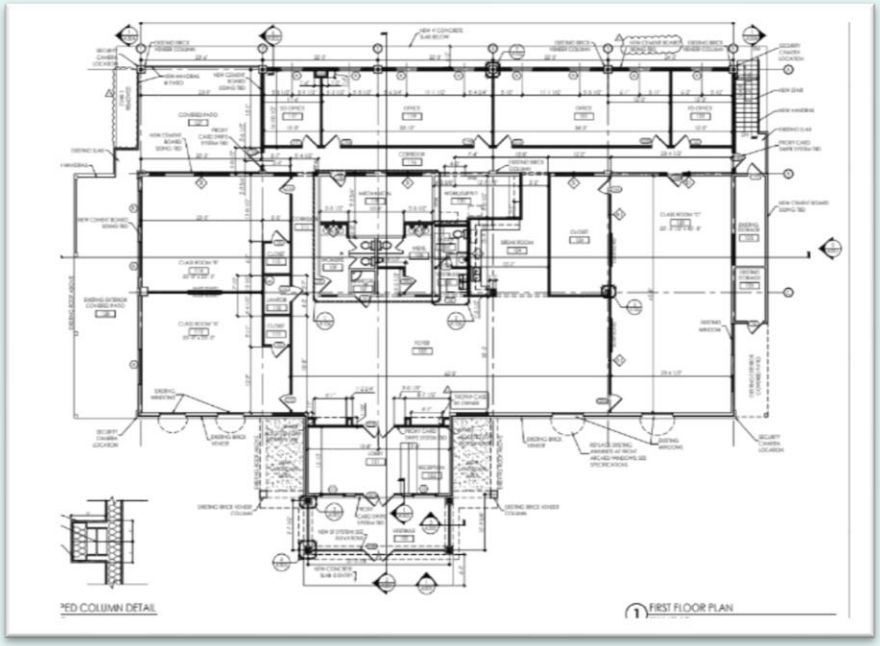
- Renovation of the former Links Golf Club House into a Public Safety Training Facility.
- Creation of an East Precinct with assignment of Training Command Staff and Special Operations Section.
- Provide extensive training opportunities of public safety patrol and jail officers.
- Train public safety officers in critical areas of Defensive Tactics, Judgmental Use of Force, Criminal Procedures, Courtroom Testimony, Taser use, Expandable Baton, Less-Lethal Munitions and Canine Operations, etc.

Training Center Building

- Public Safety Training Center is approximately 50% complete

- Major Items:
  - Plumbing System 80%
  - Concrete and Masonry 80%
  - Electrical and HVAC at 65%
  - Entire project is at 70%
  - Basement improvements on hold due to funding limitations

- Anticipated Completion
  May/June 2019



Public Safety Master Plan Update

- Links Master Plan envisioned Public Safety improvements and the completion of Phase I & II funds the Shooting & Training Facility.
- Phase III was the Public Safety Driver training course and will be addressed as part the FY2020 CIP Budget.
  - Driving is one of the biggest liabilities facing public safety.
  - Public Safety driving course provides the means to train deputies on Pursuit and Vehicle Operations.
  - Five-Year Capital Plan will be reviewed to determine if adequate funds are still available for this purpose.

PUBLIC SAFETY TRAINING CENTER

QUESTIONS

WATER SELECTOR

BOARD OF COMMISSIONERS RETREAT

APRIL 5, 2019

Water Selector

- First installation and first unit of this kind in the world.
- Integrates components with dedicated purpose of monitoring reservoir water quality.
- WaterSelector uses real time sensor technology and takes varied samples from different depths and selects the best water at that time to bring into the plant.
- Water Selector is installed at the Lake McIntosh in Peachtree City; NTP pending at Lake Horton.

Breakeven Analysis
IXOM Proposal

Projected Cost – Capital Outlay

Description	FY2019	FY2020	FY2021	FY2022	FY2023	FY2024	FY2025
Lake Horton	450,000						
Lake McIntosh	500,000						
SubTotal Capital	**$950,000**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Projected Cost – Re-occurring

Description	FY2019	FY2020	FY2021	FY2022	FY2023	FY2024	FY2025
Annual Svc	$0	25,000	25,000	25,000	25,000	25,000	25,000
SubTotal M&O	**$0**	**$25,000**	**$25,000**	**$25,000**	**$25,000**	**$25,000**	**$25,000**
Cumulative Costs	**$950,000**	**$975,000**	**$1,000,000**	**$1,025,000**	**$1,050,000**	**$1,075,000**	**$1,100,000**

Breakeven Analysis
IXOM Proposal

Projected Savings

Description	FY2019	FY2020	FY2021	FY2022	FY2023	FY2024	FY2025
Alum	4,434	6,030	6,150	6,273	6,399	6,527	6,657
Lime	3,470	4,719	4,813	4,910	5,008	5,108	5,210
Carbon	93,872	127,667	130,220	132,824	135,481	138,190	140,954
Permanganate	16,215	22,052	22,493	22,943	23,402	23,870	24,327
Projected Savings	**$117,991**	**$160,468**	**$163,676**	**$166,950**	**$170,290**	**$173,695**	**$177,148**
Cumulative Savings	**$117,991**	**$278,459**	**$442,135**	**$609,085**	**$779,375**	**$953,070**	**$1,130,218**
ROI	**$832,009**	**$696,541**	**$557,865**	**$415,915**	**$270,625**	**$121,930**	**($30,218)**

WATER SELECTOR

QUESTIONS

TRANSPORTATION PLANNING UPDATE

Comprehensive Transportation Plan (CTP)

BOARD OF COMMISSIONERS RETREAT

APRIL 5, 2019

Current Studies

These studies are used to develop the list of future transportation projects in Fayette County

- Comprehensive Transportation Plan
- Master Path Plan
- SR 74 Corridor Study
- Sandy Creek Road, Banks Road, Tyrone Road, and Palmetto Road Corridor Study
- SR 279 Corridor Study

Local Funding Sources
2004 SPLOST

Remaining 2004 funds are allocated to these projects

- **New Road Construction**
  - East Fayetteville Bypass
- **Intersections**
  - Sandy Creek, Sams Drive, and Eastin
  - Antioch and Goza
  - Peachtree Parkway and Crosstown Drive
  - SR 85 South
- **Realignments**
  - Goza Road and Bernhard
  - Hampton Road and SR 92 (Woolsey)
- **Medians**
  - SR 85 (Fayetteville)
- **Bridges**
  - Coastline Road bridge replacement

Local Funding Sources
2017 SPLOST

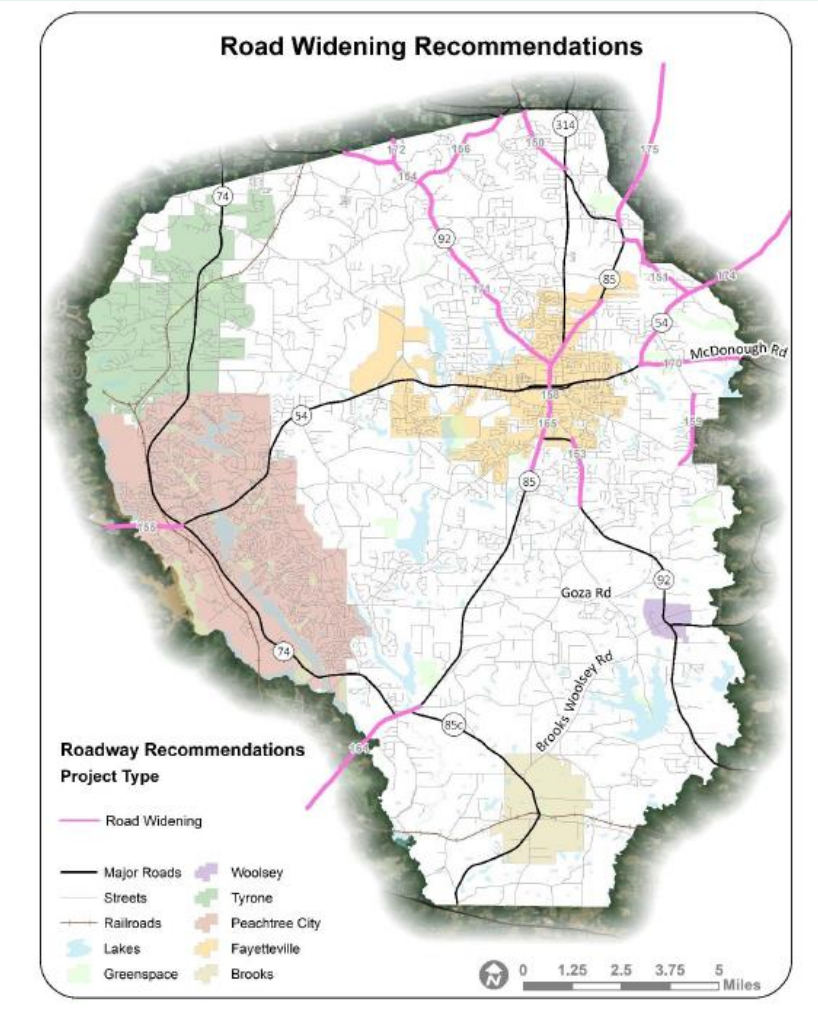
Estimated Revenue of $19.5M Allocated to:	
Corridors[1]	43%
Intersections	28%
Infrastructure Preservation and Improvements	18%
Pedestrian, Bike, and Path	9%
Detailed Planning Studies	2%

[1]$8.3M allocated for corridors to be programmed by the BOC using planning study results

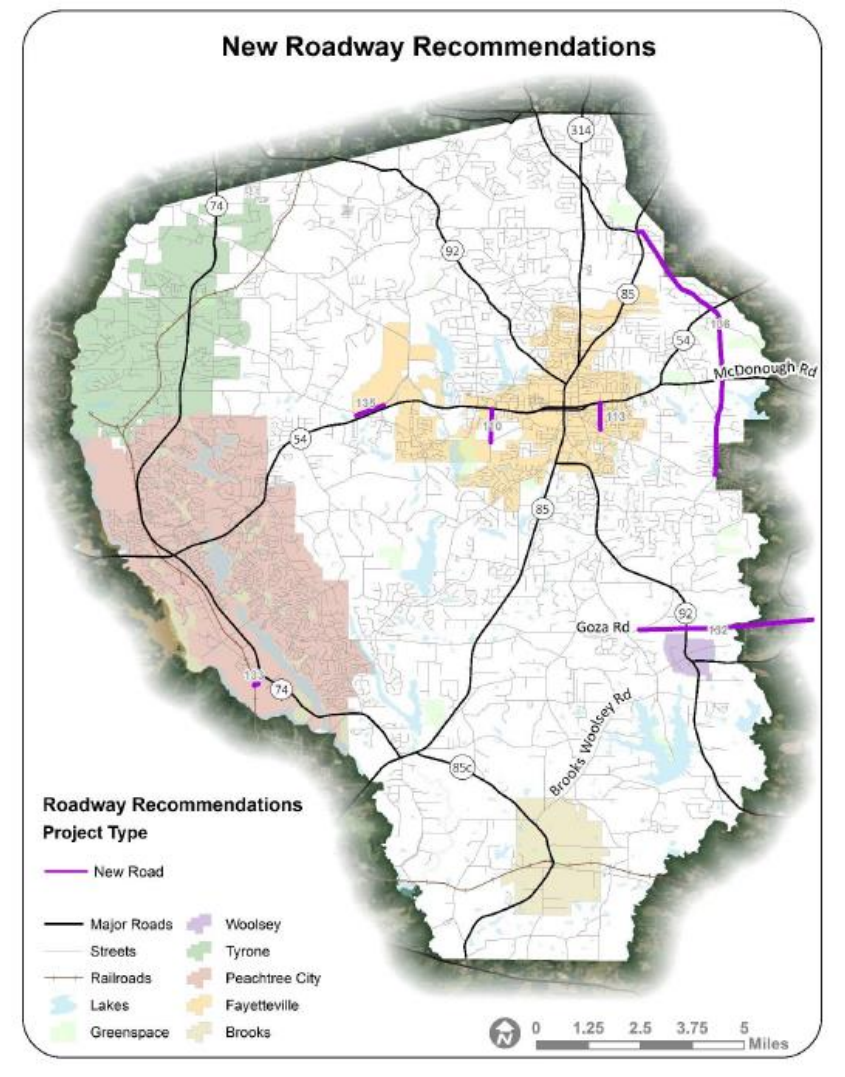
Comprehensive Transportation Plan Draft Recommendations

- Road Widening
- New Roads
- Corridor Improvements
- Intersections
- Bridges
- Paths

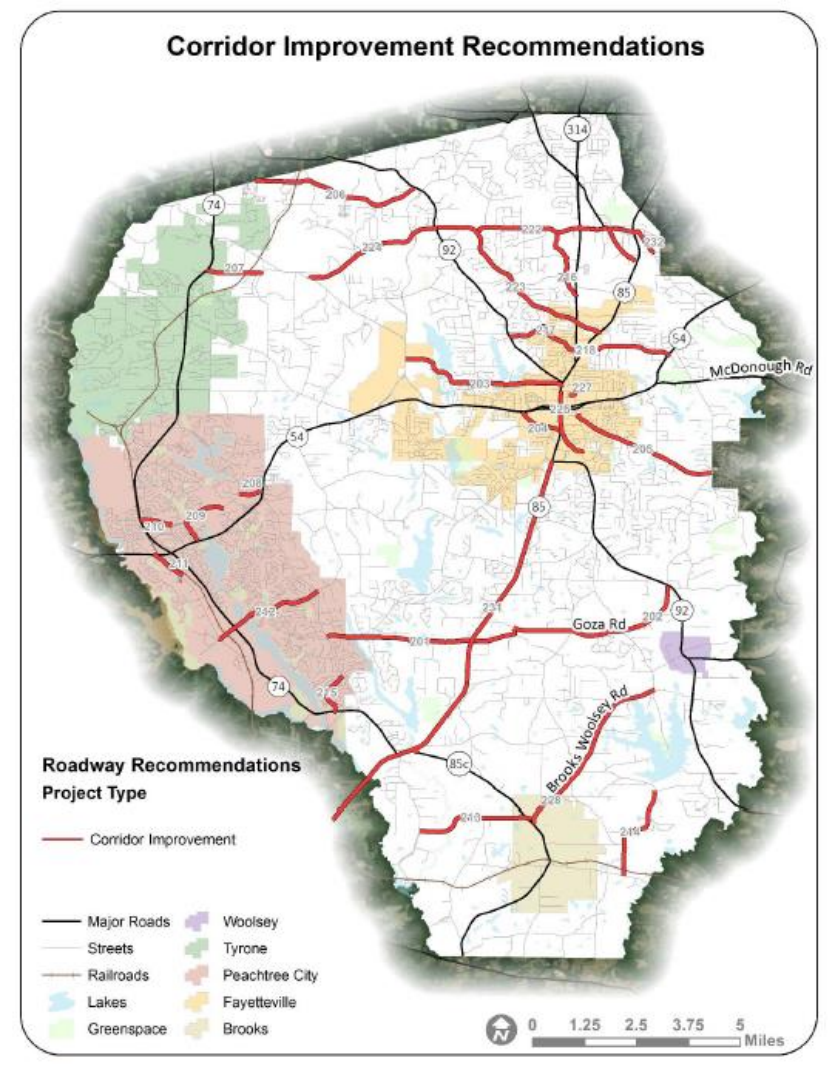
Road Widening - CTP Draft



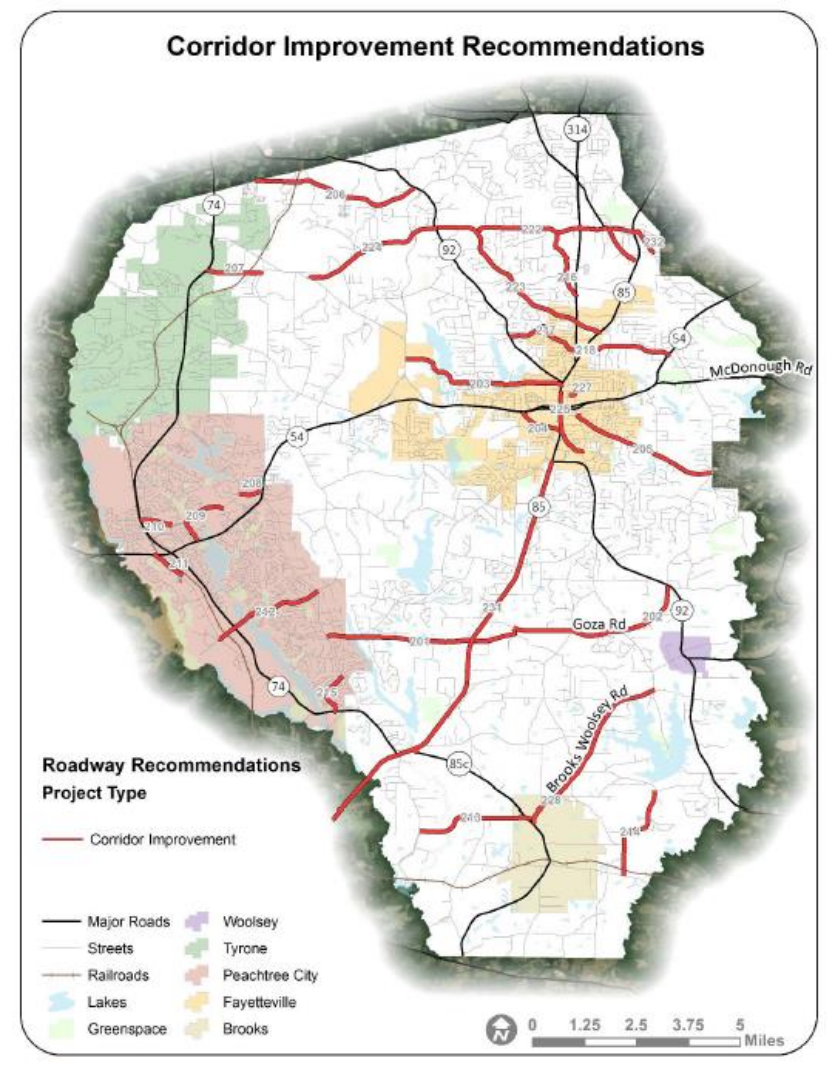
New Roadways - CTP Draft



Corridor Improvements - CTP Draft



Intersection and Bridge Improvements - CTP Draft



CTP Requiring Further Discussion

The Comprehensive Transportation Plan has completed the public engagement; Staff has presented and has received comments from each governing body; the final step is to finalize the document with our Commission final review.

The below projects have been raised as concerns and will need to be addressed as part of a final recommendation.

- TDK Extension
- Lester Road Airport
- Hood Avenue/Hood Road

Future Funding Opportunities

- **ARC Project Solicitation**
  - Application window expected in Fall 2019
  - Award announcement in Spring 2020
  - Funded allocated in FY2022 (July 2012) and beyond
  - Realistic potential - $2M to $3M annually

- **GDOT Projects and Assistance**
  - Bridges
  - Safety
  - Maintenance
  - State Route Improvements

Strategy for State and Federal Aid

- Select projects from a completed study
- Select projects with regional significance
- Prioritize and stay consistent
- Cooperation and support from local governments, GDOT District Office, NGOs, CIDs, and the public
- Locally fund concept reports/design
- Allocated local match funded

TRANSPORTATION PLANNING UPDATE

Comprehensive Transportation Plan

QUESTIONS