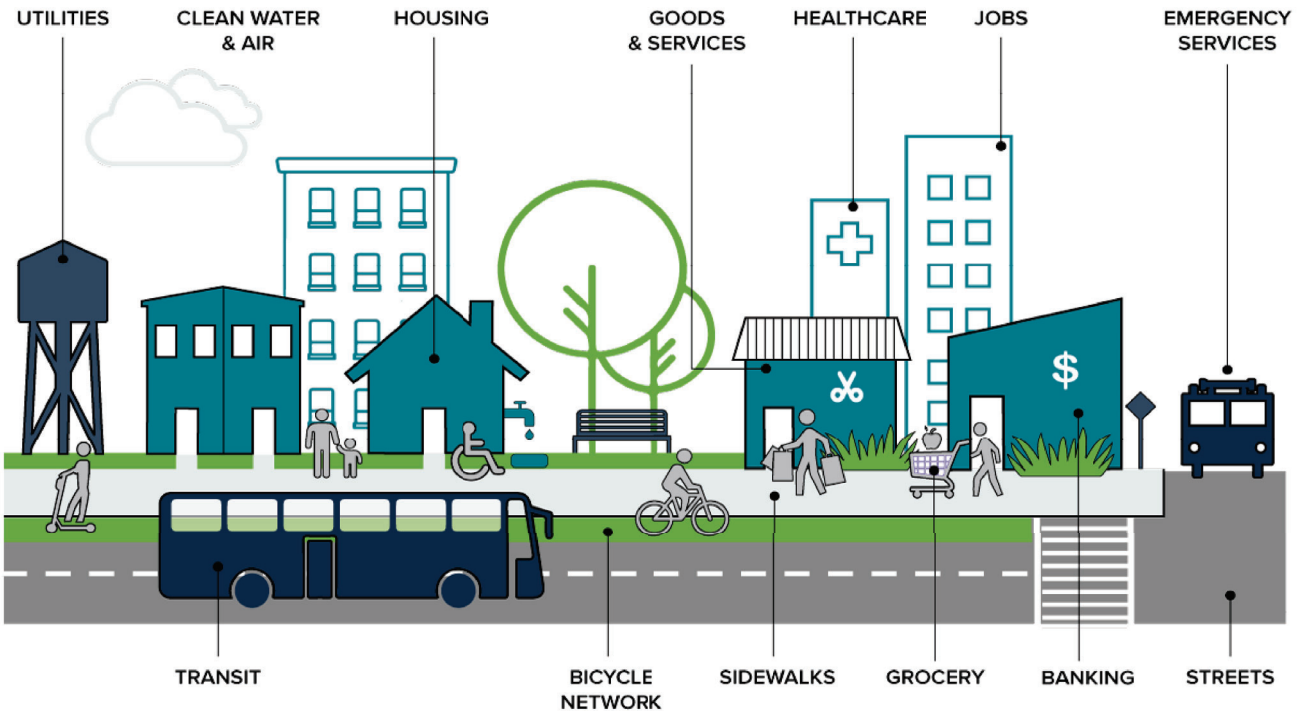


Infrastructure Update

DECEMBER 11, 2023 - ACTION REVIEW



December 19, 2022, City Council Infrastructure Discussion



Multi-Phase Approach

► Rezoning Summary Tune-Up (Q3 2023)

- Launched [Development Near Me](#) app, which provides information on development projects requiring permitting, grading permits and rezonings
- Began rolling out improved/more frequent notifications in August

► Focus on Five Key Areas (Q4 2023)

- Assess existing metrics to determine whether they are effectively preparing for growth

► 2040 Comprehensive Plan Implementation Dashboard (Q2 2024)

- Incorporate existing and new infrastructure capacity metrics into the dashboard

Focus Area Summary

Focus Area	Guiding Agency	Key Measurables
Schools	Charlotte-Mecklenburg Schools	Elementary School: 100% utilization Middle School: 130% utilization High School: 130% utilization
Fire	National Fire Protection Association Insurance Services Office Center for Public Safety Excellence	Total Response Time <6 minutes Effective Response Force <10:20 Building Inspections = 100%
Water	Environmental Protection Agency NC Department of Environmental Quality	Fire Flow Protection Minimum Pressures 100% Water Quality Compliance
Sewer	Environmental Protection Agency NC Department of Environmental Quality	Capacity Assurance Program 80:90 Wastewater Treatment Rule Daily Monitoring Reports
Storm Water	NC Department of Environmental Quality City Council Policy	Design-year Storm Events (10-yr, 25-yr, 100-yr) Removal of Targeted Runoff Pollutants
Transportation	Federal Highway Administration NC Department of Transportation City Council Policy	Manual on Uniform Traffic Control Devices Strategic Mobility Plan/Streets Manual



Overview

► 184 Schools

► Diversity

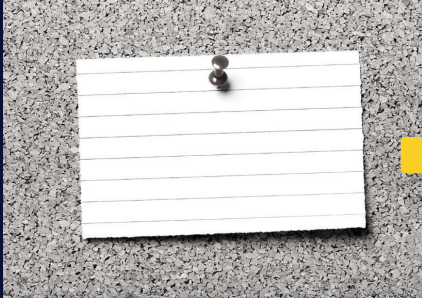
- 175 Countries of Origin
- 204 Native Languages Spoken

► Enrollment

- 2nd Largest in the state
- 17th Largest in the nation



Planning at CMS involves...



ASSUMPTIONS



METHODOLOGIES



STANDARDS

These may be internal or external factors

7

Municipal Planning vs School Planning

	Municipal	School
Primary Inputs	Land suitability analysis Informed by development	Birth rates and cohort survival rates Adjusts for boundary changes
Projections	Development growth Population growth	5- and 10-year annual individual, school, and grade level enrollment
Types of Decisions Informed	Investments in infrastructure Economic development Community health and viability	Funding requests from state/county agencies Resource allocations to schools

8

School Utilization Tracking

A	D	E	F	L	M	N	O	P	T	U	V	AE	AF	AG	AJ	AN
Facility Information			Teachers				Classrooms		Classrooms/Mobiles		Enrollment			Data		
School Number	K-6 Schools	FOCUS	Magnet (Full or Partial)	Pre-K Teachers	Total ES Teachers	Total ES Teachers (Less PreK Teachers)	Total CR Teachers (Less EC Resource and ESL Teachers)	Building Classrooms	Mobile Class Not In service	Total Mobile Classrooms	Total Classrooms In/Out Service	2019-20 Membership (including EC)	2019-20 Pre-K Membership	Total 2019-20 Membership, Incl Pre-K	Ratio (Membership Total/Total CR Teachers)	Staff Building Utilization (Total CR Teachers/Blg CR In Core)
4300	Albemarle Road	X		0	52.5	52.5	50.5	42	8	34	76	837		837	16.57	120%
4308	Allenbrook	X		2	22.5	20.5	20	21	0	11	32	280	23	303	15.15	95%
4314	Bain			0	51	51	49	59	0	0	59	925		925	18.88	83%
4437	Ballantyne			0	50.5	50.5	48	39	0	5	44	966		966	20.13	123%
4328	Barnette			3	49	46	47	39	0	6	45	770	66	836	17.79	121%
4316	Barringer	X	P	0	35	35	33	36	0	4	40	497		497	15.06	92%
4369	Berewick			2	47	45	44.5	39	0	10	49	729	36	765	17.19	114%
4322	Beverly Woods			0	47.5	47.5	45	38	0	8	46	780		780	17.33	118%
4335	Billingsville (K-2)	X	P	0	31.5	31.5	30.5	35	0	2	37	409		409	13.41	87%
4442	Blythe		P	2	57.5	55.5	55	50	0	13	63	918	35	953	17.33	110%
4329	Briarwood	X		2	44.5	42.5	43.5	28	0	20	48	669	36	705	16.21	155%
4489	Bruns Avenue		P	2	25.5	23.5	23.5	39	0	14	53	412	28	440	18.72	60%
4336	Chantilly K-6		F	0	20.5	20.5	20	18	0	10	28	293	47	340	17.00	111%
4338	Clear Creek			2	32.5	30.5	30	30	0	9	39	482	34	516	17.20	100%
4346	Cornelius			0	35.5	35.5	33	39	0	4	43	652		652	19.76	85%
4349	Cotswold (3-5)		P	0	28	28	26	32	0	7	39	457		457	17.58	81%
4418	Croft Community			3	32.5	29.5	31	39	0	0	39	425	63	488	15.74	79%
4352	Crown Point			2	32.5	30.5	30.5	37	0	2	39	559	31	590	19.34	82%
4362	David Cox			3	41.5	38.5	39	37	0	10	47	611	53	664	17.03	105%
4365	Devonshire	X		0	39.5	39.5	37	32	0	8	40	639		639	17.27	116%
4367	Dilworth (Latta Campus 3-5)			0	19.5	19.5	18	28	0	2	30	341		341	18.94	64%

CMS Looking Ahead

► Improved Collaboration

- Integrate CMS data into Development Near Me app
- Tune-up rezoning comments to incorporate future capital facility plans

► School Capital Planning

- \$2.5 Billion Bond approved in November
- Provides for 30 projects impacting 35 schools

Bond Project List



- ALBEMARLE ROAD MIDDLE SCHOOL
- ALLENBROOK ELEMENTARY
- BERRYHILL SCHOOL
- COCHRANE COLLEGIATE ACADEMY/IMECK
- BEVERLY WOODS ELEMENTARY SCHOOL
- CORNELIUS ELEMENTARY SCHOOL
- COTSWOLD/CHANTILLY/BILLINGSVILLE
- COULWOOD STEM ACADEMY
- DILWORTH ELEMENTARY SCHOOL
- E.E. WADDELL HIGH SCHOOL
- EAST MECKLENBURG HIGH SCHOOL
- GARINGER HIGH SCHOOL
- HARDING UNIVERSITY HIGH SCHOOL
- HUNTERSVILLE ELEMENTARY SCHOOL
- J.T. WILLIAMS
- MATTHEWS ELEMENTARY SCHOOL
- MONTESSORI SECONDARY AT MARIE G. DAVIS
- NEW MIDDLE SCHOOL #1
- NEW MIDDLE SCHOOL #2
- NEW MIDDLE SCHOOL #3
- NEW SECOND WARD MEDICAL & TECHNOLOGY HIGH SCHOOL
- NORTH MECKLENBURG HIGH SCHOOL
- NORTHWEST SCHOOL OF THE ARTS/FIRST WARD
- PARK ROAD MONTESSORI/SEDFIELD/DILWORTH
- SEDGFIELD ELEMENTARY SCHOOL
- SOUTH CHARLOTTE MIDDLE SCHOOL
- SOUTH MECKLENBURG HIGH SCHOOL
- STEELE CREEK ELEMENTARY SCHOOL
- UNIVERSITY PARK CREATIVE ARTS
- VILLA HEIGHTS ELEMENTARY SCHOOL
- WEST REGIONAL ATHLETIC COMPLEX
- WILSON STEM ACADEMY

For more information or if you have questions about the CMS 2023 bond referendum: Call (980) 343-7450, email cmsbond@cms.k12.nc.us or visit <https://charmeckschools.org/bond>.





Overview

<p>43 Firehouses</p>	<p>132,853 Total Incidents (FY23)</p>	<p>60 Seconds Dispatch Time Standard</p>
<p>270 Firefighters 24/7/365</p>	<p>19,536 Fire Incidents (14.7%)</p>	<p>60 Seconds Turnout Time Standard</p>
<p>43,644 Hours on Emergencies</p>	<p>87,447 EMS Incidents (65.8%)</p>	<p>4 Minutes Travel Time Standard</p>
<p>344,390 Hours Training</p>	<p>25,870 Other Incidents (19.5%)</p>	<p>6 Minutes Total Response Time</p>

CFD is accredited by the Center for Public Safety Excellence and holds an Insurance Services Office Class 1 rating. This combination is achieved by less than 1% of US fire departments.



Infrastructure Capacity Safe Guards

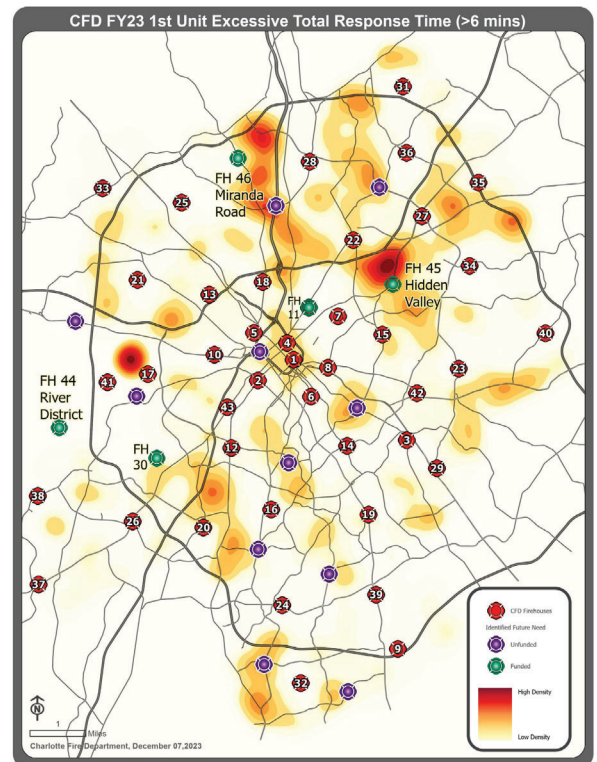
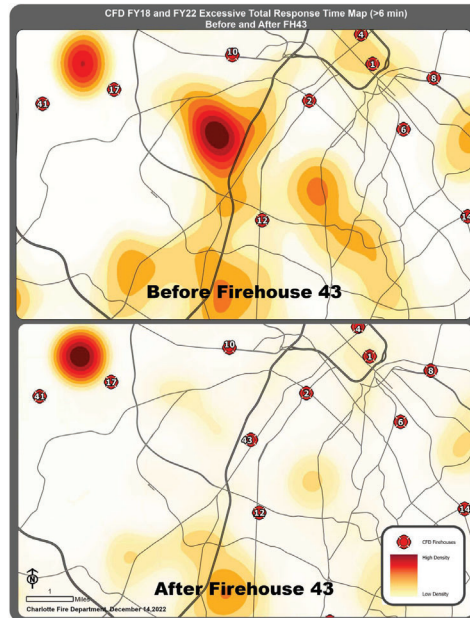
- ▶ **300+ National Fire Protection Association codes and standards**
 - Total Response Time standards by unit response
- ▶ **Established benchmarks for quality control based on industry standards**
 - CFD evaluates at the 90th percentile
- ▶ **Long-range predictive response time model**
 - Analyze planned growth to help locate future firehouses and companies
 - Achieve and maintain response time standards
- ▶ **Peer reviews through the Center for Public Safety Excellence and Insurance Services Office**
 - Rated every five years; next rating in late 2025 or early 2026



Determining Need

CFD determines resource needs and locations by analyzing both historical and predictive incident response data.

\$103 Million allocated or planned in CIP to construct five new fire facilities in FY 2022 – 2028.



Fire Looking Ahead

► Develop Additional Growth Metrics

- Establish thresholds to align operations and support staffing with community growth demands

► Update the Fire Facilities Master Plan

- Update prioritized infill firehouse plan to achieve and maintain Response Time standards
- Develop prioritized firehouse expansions and replacement plans to accommodate additional companies to achieve and maintain response time standards

► Tune-Up Rezoning and Annexation Comments

- In addition to Fire Code comments, provide comments on potential fire response implications on rezonings
- Outline potential fire response implications on annexations to ensure sufficient and equitable response times

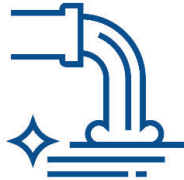


Overview



116

Million Gallons of Water Pumped on Average Each Day



85

Million Gallons of Wastewater Treated on Average Each Day



9,132

Miles of Water and Wastewater Pipes Maintained



472

Water Main Leaks Repaired



318,067

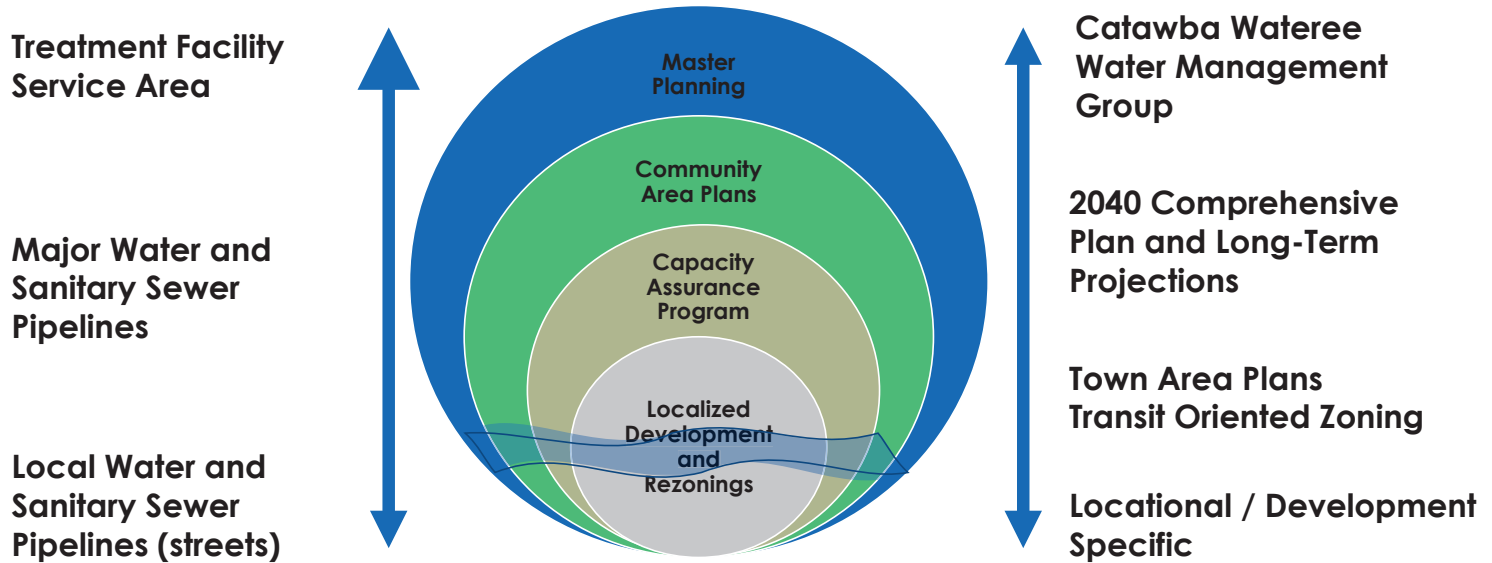
Active and Inactive Water Meters

AAA Rated by Moody's Investors Service, Fitch, and Standard & Poor's Financial Services

A gallon of water costs less than \$0.04

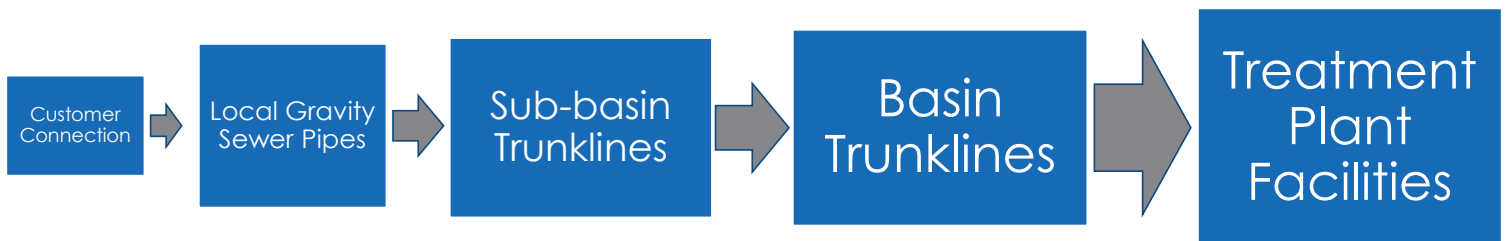
1.14 M Population Served (Estimated)

Community-Supporting Infrastructure



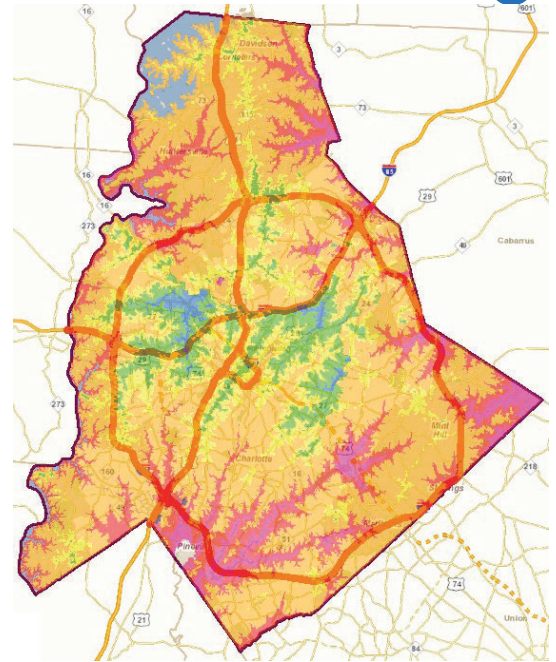
Capacity Assurance Program

- ▶ Instituted in 2009
- ▶ Recommended during due diligence phase of development
- ▶ Evaluates the risk of sanitary sewer overflow from new service connections and development-triggered system expansions
 - Pipe capacity from point of connection to the treatment plant



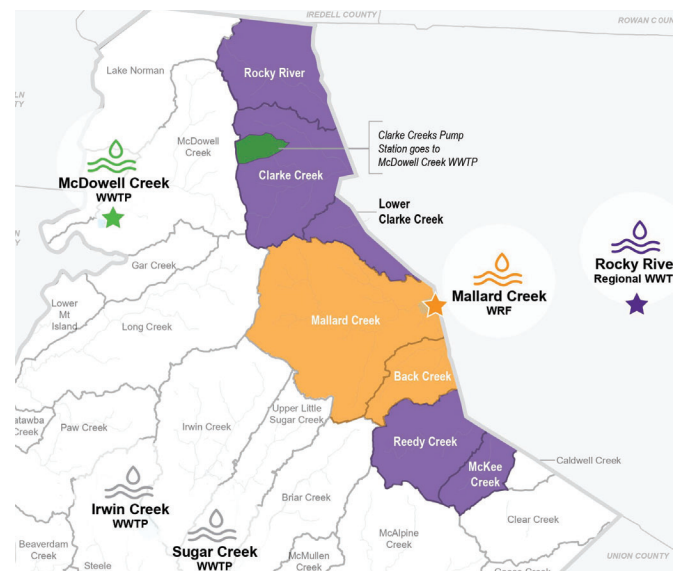
Water Distribution System Master Planning

- ▶ **System performance criteria**
- ▶ **Water demand projections**
 - Population
 - Consumption data (from meters)
- ▶ **Evaluation of system (modeling, analysis, projections, testing)**
 - Water demand
 - Facilities
 - Field testing
 - Hydraulic model
 - Water Quality
 - Distribution
 - Capacity
 - Reliability



Example: WSACC Service Area

- ▶ **WSACC Rocky River Regional WWTP Improvements**
- ▶ **Clarke Creek PS and FM**
- ▶ **Sanitary Sewer Evaluation Survey and Repair**
- ▶ **Resumed development permit approvals June 2023**



Charlotte Water Looking Ahead

Planning Efforts

- ▶ **CBD Water Master Plan (2022)**
- ▶ **Wastewater Master Plan (2022)**
- ▶ **Water Distribution System Master Plan Update**
- ▶ **Sewer Basin Studies**
 - Central Business District
 - Steele Creek
 - Briar Creek

Capital Projects

- ▶ **Stowe Regional WRRF**
- ▶ **Mallard Creek WWTP Expansion**
- ▶ **960 Zone (eastern county) Water Transmission Improvements**
- ▶ **Franklin WTP Improvements**

Next Steps

- ▶ **Winter 2023/2024: Bring back remaining two infrastructure focus areas, Storm Water Services and Transportation**
- ▶ **Winter 2023/2024: Confirm infrastructure priorities with City Council as part of key performance indicator discussions**
- ▶ **Spring 2024: Incorporate key performance indicator updates into 2040 Comprehensive Plan Implementation Dashboard**