BRIDGE AND DRAINAGE INFRASTRUCTURE UPDATE

PUBLIC WORKS COMMITTEE

MARCH 16, 2021

Outline

- Overview of bridges in the city
- Inspection of bridges
- Known maintenance costs
- Overview of drainage maintenance
- Types of programs/responsibilities
- Priority drainage project costs

City Owned Bridges

- City currently has 54 bridges on our road network that we have maintenance responsibility (doesn't include culvert/pipe crossings or NCDOT maintained bridges).
- Age of our bridges vary dramatically (several bridges were constructed in the 1920's and are still in service).
- Size of the bridge, type of construction and materials vary greatly (i.e. wood timbers, concrete, steel).



Inspection of Bridges

- Every two years bridges are inspected and given a condition rating from 0 to 100 (with 100 being the best possible condition).
- Inspections are conducted by a contracted bridge inspector under the purview of NCDOT.
- Inspection reports can yield findings that require priority maintenance or critical repairs.
- These findings could require the local government to post weight restrictions or close the bridge until repairs are made.



Typical Issues Found During Inspection

- Corrosion of steel support beams.
- Spalling of concrete support structures that exposed reinforcing steel.
- Spalling of concrete bridge decking.
- Rot of timber decking or wooden abutments.
- Drift and debris built up on the upstream side of the bridge causing undermining.
- Wingwall failures.





Maintenance Costs for 15 Selected Bridges

BRIDGE NUMBER	ROUTE/STREET CARRIED	WARD	LOCATION	MAINTENANCE TYPES	ESTIMATED BRIDGE REPLACEMENT COSTS**
330009	E. Fifth St. (WBL)	E	0.01 mile E. of Jct. Old Greensboro Rd.	Latex deck overlay, Piling, Scour, Conc. Spalls	\$386,300
330083	Swaim Rd.	S	50 feet S. of Jct. High Point Rd.	Stone repl., Tuckpointing, Abutment scour	\$42,600
330209	Valley Rd.	NW	0.45 mile N. of Jct. Reynolda Rd.	Concrete spalls-deck, girders, and substructure	\$37,100
330280	High Cliffs Rd.	Ν	0.1 mile W. of Jct. SR 1797	Wingwall rebuild and Channel scour	\$63,800
330296	W. First St.	NW	0.05 mile W. of Northwest Blvd.	Concrete spalls-girders, columns, and substructure	\$50,900
330330	Old Greensboro Rd.	E	0.1 mile W. of Jct. E. Fifth St.	Steel beams repairs and concrete spalls	\$79,900
330331	E. Fifth St. (EBL)	Е	0.01 mile E. of Jct. Old Greensboro Rd.	Rebuild approach slabs, Drift, Conc. Spalls-sub and superstructure	\$51,800
330373	Cameron Ave.	E	0.02 mile N. of Jct. US Rte. 311	Concrete spalls- substructure & abutments	\$63,000
330376	Ninth St.	E	0.01 mile E. of Jct. Main St.	Concrete spalls - deck, railing, girders, abutments	\$45,700
330380	Link Rd.	sw	0.01 mile W. of Jct. Peters Creek Pkwy.	Steel piles, Painting, Bulkhead, Spalls, Erosion	\$59,400
330386	Vine St.	E	0.06 mile E. of Jct. 4th St.	Concrete spalls-deck, girders, Decorative painting	\$28,600
330387	Glade St.	NW	200 feet E. of Jct. Hawthorne Rd.	Clean-up, Conc. Spalls- everywhere, steel beams	\$191,500
330390	16th St.	NE	0.01 mile W. of Jct. US Rte. 52	Concrete spalls- substructure, rails, underside deck	\$70,400
330527	Northwest Blvd.	N	100 feet W. of Jct. Rundell St.	Debris, Concrete spalls- underside deck & girders	\$80,400
330592	South Main St.	SE	0.04 mile N. of Jct. US Rte. 52	Steel piles, clean-up, Conc. Spalls- deck, girders	\$32,500
				TOTAL =	\$1,283,900

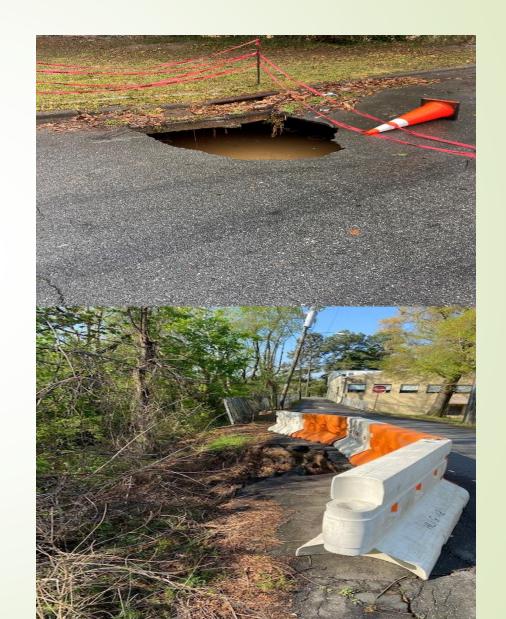
What is Drainage Maintenance?

- COWS owns, operates and maintains all of the pipes, catch-basins and structures within the public R/W and on City owned property (over 22,000 inventoried structures and conveyances).
- Repairs/Upgrades to the public drainage system and City owned stormwater controls (i.e. retention ponds, sand filters and other treatment devices).
- Private property owner drainage assistance under the 70/30 policy.
- Street sweeping.



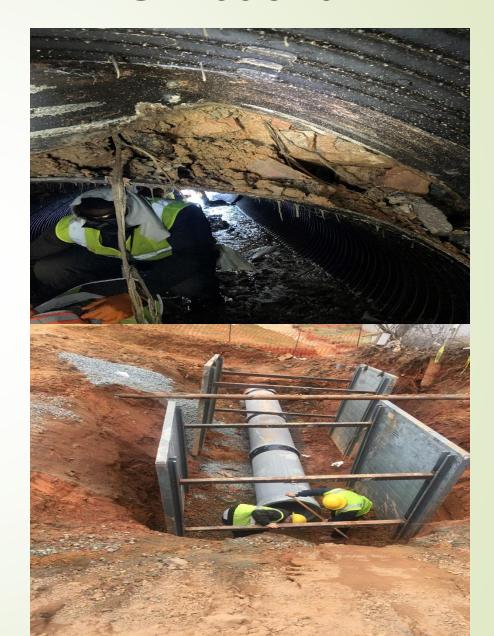
RIGHT-OF WAY DRAINAGE ISSUES

- As storm events grow in number and intensity, it stresses the City's aging drainage systems.
- Many of our drainage systems were installed decades ago (i.e. in the 1940's, 1950's and have exceeded their hydraulic lifetime).
- Over 30 major repair projects throughout the city and new projects are added regularly.
- Priority capital projects list over \$25,000,000 and growing.
- Over 15 years to complete.



RIGHT-OF WAY DRAINAGE ISSUES

- Staff respond to over 500 drainage calls per year in the public right-ofway.
- Issues can vary widely: from blocked catch basin causing road flooding to a multi-block drainage system failure.
- Smaller repairs are completed by inhouse drainage crews and larger projects are completed by contracted forces through the capital improvements process.



CITY OWNED STORMWATER CONTROLS

- COWS owns stormwater retention devices on city property (i.e. Blum Park, Washington Park, Fire Stations, Lowery Street Facility etc.).
- Infrastructure failures on city owned properties can result in significant capital expenses (in the last seven years Lockland Park, Spring Park and Washington Park cost over 3 million dollars).
- Maintenance of stormwater control measures is a National Pollutant Discharge Elimination System (NPDES)Permit requirement.





PRIVATE PROPERTY DRAINAGE ASSISTANCE

- Staff respond to over 350 private property drainage calls per year.
- For single family and multi-family residential properties, if conditions exist such as flooding of a dwelling, severe erosion of a drainage way or a situation that threatens the structural integrity of a dwelling then cost share options exist through the City's 70/30 cost share.
- Design and construction of City Council approved cost share's are completed by in-house staff.



CAPITAL DRAINAGE PROJECTS

PROJECT	WARD	JUSTIFICATION	PROJECT COST	
Old Salem Drainage Project	S	Undersized/Failing Infrastructure within ROW	\$4,511,840	
Long Drive Infrastructure Project	N	Emergency Repair	\$870,000	
Violet Street Infrastructure Repair	S	Emergency Repair	\$300,000	
Patterson Ave Infrastructure Repair	Е	Emergency Repair	\$1,500,000	
Robbins/Gyro Drive Culvert Replacements	SW	Failing Infrastructure within ROW	\$380,000	
Bennett Drive Infrastructure	W	Failing Infrastructure within ROW	\$744,000	
261 Commonwealth Drive	W	Failing Infrastructure within ROW	\$251,500	
27 th Street Infrastructure Repair	NE	Failing Infrastructure within ROW	\$130,000	
Runnymede Stream Infrastructure replacement	NW	Failing Infrastructure	\$2,250,000	
Stormwater Infrastructure Improvements	ALL	ROW Drainage Repairs	\$1,000,000	
Drainage Improvements on Private Property	ALL	Private Property Assistance	\$250,000	
7 th Street Drainage Project	Е	Public/Private Drainage Repair	\$1,750,000	
City Yard Remediation Project (Phase I)	S	Regulatory Compliance	\$3,566,017	
City Yard Remediation Project (Phase II)	S	Regulatory Compliance	\$7,122,099	
City Yard 48" CMP (bore/jack replacement)	S	Failing Infrastructure within ROW	\$410,000	
Piping Enhancement Project (Central District)	Е	Water Quality Enhancement	\$300,000	
			\$25,335,456	
NOTE: Drainage CIP projects submitted for review/approval. Does not include right-of-way drainage projects to be installed by inhouse crews or maintenance and upkeep of existing projects.				
	Old Salem Drainage Project Long Drive Infrastructure Project Violet Street Infrastructure Repair Patterson Ave Infrastructure Repair Robbins/Gyro Drive Culvert Replacements Bennett Drive Infrastructure 261 Commonwealth Drive 27th Street Infrastructure Repair Runnymede Stream Infrastructure replacement Stormwater Infrastructure Improvements Drainage Improvements on Private Property 7th Street Drainage Project City Yard Remediation Project (Phase I) City Yard Remediation Project (Phase II) City Yard 48" CMP (bore/jack replacement) Piping Enhancement Project (Central District)	Old Salem Drainage Project Long Drive Infrastructure Project N Violet Street Infrastructure Repair Patterson Ave Infrastructure Repair Robbins/Gyro Drive Culvert Replacements Bennett Drive Infrastructure W 261 Commonwealth Drive W 27th Street Infrastructure Repair Runnymede Stream Infrastructure replacement NW Stormwater Infrastructure Improvements ALL Drainage Improvements on Private Property ALL 7th Street Drainage Project City Yard Remediation Project (Phase I) City Yard Remediation Project (Phase II) City Yard 48" CMP (bore/jack replacement) Piping Enhancement Project (Central District) E NOTE: Drainage CIP projects submitted for review/approval. Does not inclusion.	Old Salem Drainage Project S Undersized/Failing Infrastructure within ROW Long Drive Infrastructure Project N Emergency Repair Violet Street Infrastructure Repair Patterson Ave Infrastructure Repair Robbins/Gyro Drive Culvert Replacements SW Failing Infrastructure within ROW Bennett Drive Infrastructure W Failing Infrastructure within ROW 261 Commonwealth Drive W Failing Infrastructure within ROW 27th Street Infrastructure Repair NE Failing Infrastructure within ROW Runnymede Stream Infrastructure replacement NW Failing Infrastructure within ROW Runnymede Improvements ALL ROW Drainage Repairs Drainage Improvements on Private Property ALL Private Property Assistance 7th Street Drainage Project E Public/Private Drainage Repair City Yard Remediation Project (Phase I) S Regulatory Compliance City Yard Remediation Project (Phase II) S Regulatory Compliance City Yard 48" CMP (bore/jack replacement) S Failing Infrastructure within ROW Piping Enhancement Project (Central District) E Water Quality Enhancement NOTE: Drainage CIP projects to be installed by in-	

Questions?