

City of Raleigh:
Engineering Services
Department

Stormwater Management

Stormwater Asset Management
Program Overview
October 9, 2019



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Asset Management Program Update

- Asset Management Overview
- Transportation Field Services
- Current Projects
- Short Term Future
- And Beyond...



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Asset Management Overview

- Current Staff
- Responsibilities of Staff
- Assets
- Maintenance



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Asset Management Overview

- 5 Staff
- (1) Asset Management Program, (4) GIS/Mapping Program



Asset Management Overview

Dams	43 (21 HH)
SCM	~75+++
RDOT Non-Qualifying Structures (Bridge, Culverts, Arch)	~800
Subsurface Pipe (In ROW)	~420 Miles
Subsurface Pipe (Out ROW)	~450 Miles
Outlets	~825
Inlets	~32,000
Structures (Manhole, Junction Box)	~2,800
Stream	~1,200 Miles



Asset Management within CIP Plan

Stormwater System Repairs/Asset Rehab/Asset Mgt

FY 20	FY 21	FY 22	FY 23	FY 24	5-Year Total
\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$2.5 M

COR SCMs and Dams Program (\$120,000 Maintenance Budget)

FY 20	FY 21	FY 22	FY 23	FY 24	5-Year Total
\$200,000	\$200,000	\$400,000	\$500,000	\$500,000	\$1.8 M



Asset Management within Integrated Project Prioritization Model

Consequence of failure Probability of failure	High / life safety threat Very dangerous	Very serious threat	Heightened threat Potentially serious	Non-serious consequence(s) Minimal to no safety concerns
Most probable	10	9	8	4
Highly probable	9	8	7	3
Probable	8	7	6	2
Improbable/minimal	7	6	5	1



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Asset Management Overview

- Maintenance, Operation and Compliance, Dams, Stormwater Control Measures
- Inspection Non-Qualifying DOT
- Planning Maintenance for the rest of Assets



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Asset Management Overview

- Maintenance – Reliance on Asset Management Program, Integrated Watershed Master Plan, Capital Improvement Plan, Water Quality, Drainage Assistance, RDOT Transportation Field Services (TFS)
- TFS has a huge impact on maintenance efforts.



Transportation Field Services – Stormwater Maintenance

- \$5.5 Million Stormwater Funding
- 55 Staff
- CCTV Camera Vehicles
- Excavators, Backhoes
- Vacuum Trucks
- Street Sweepers



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Transportation Field Services – Stormwater Maintenance

Stormwater Maintenance

Staff: Provide multiple
services to City

- Culvert Maintenance
- CCTV Inspection
- Ditch Maintenance
- Drainage Assistance
Projects





Transportation Field Services – Stormwater Maintenance

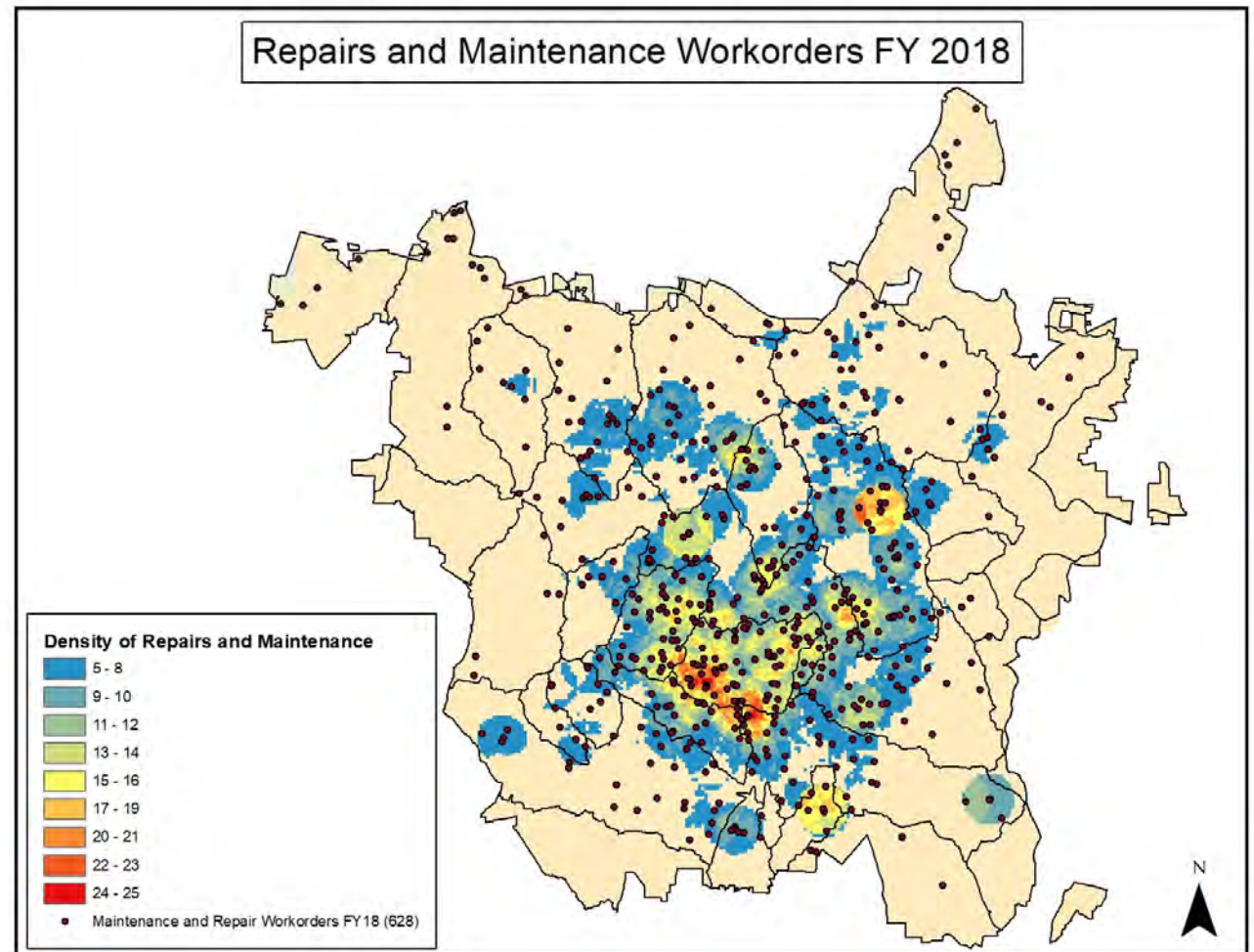
- Jet Flushing
- Hydroexcavation
- Inlet Maintenance
- Pipe Repair





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The majority of the 1300 Repair and Maintenance Workorders for FY 2018 are concentrated near the Downtown area





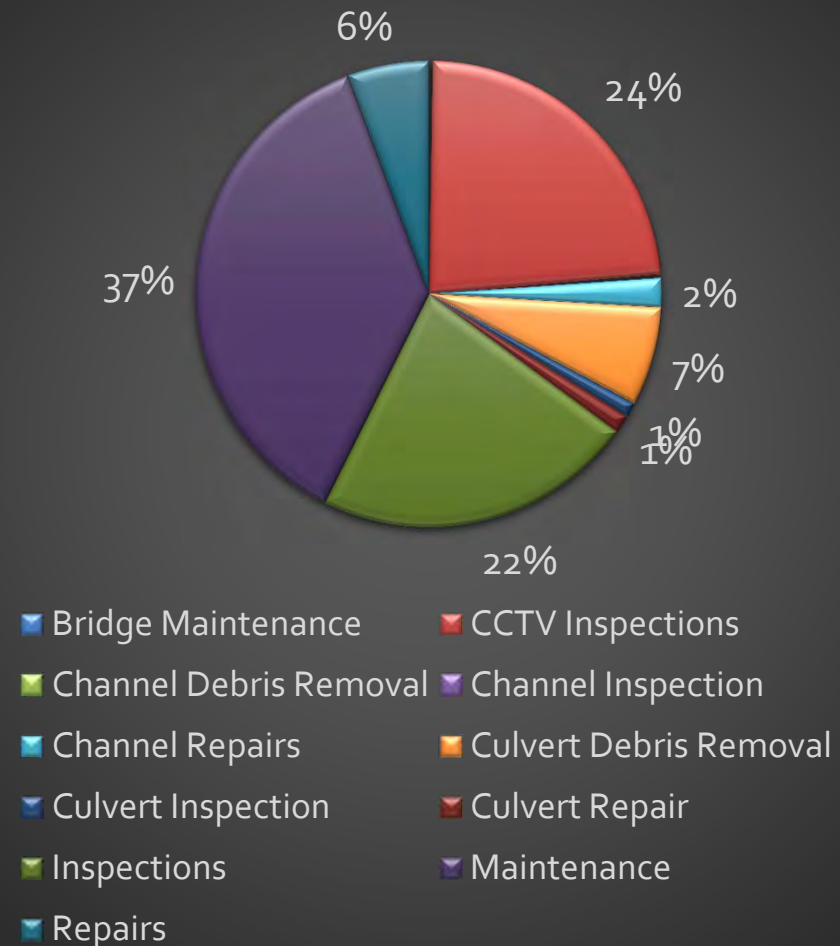
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Percentage of Workorders by Type for FY 2018

Top Four Types by Percentage:

1. Maintenance (37%)
2. CCTV Inspections (24%)
3. Inspections (22%)
4. Culvert Debris (7%)

Number of Workorders





Transportation Field Services – Stormwater Maintenance

- CCTV Inspection
- Important for Planning
 - PACP (Pipeline Assessment Certification Program) – Ratings from Good to Bad
 - Cityworks Data to identify location of work





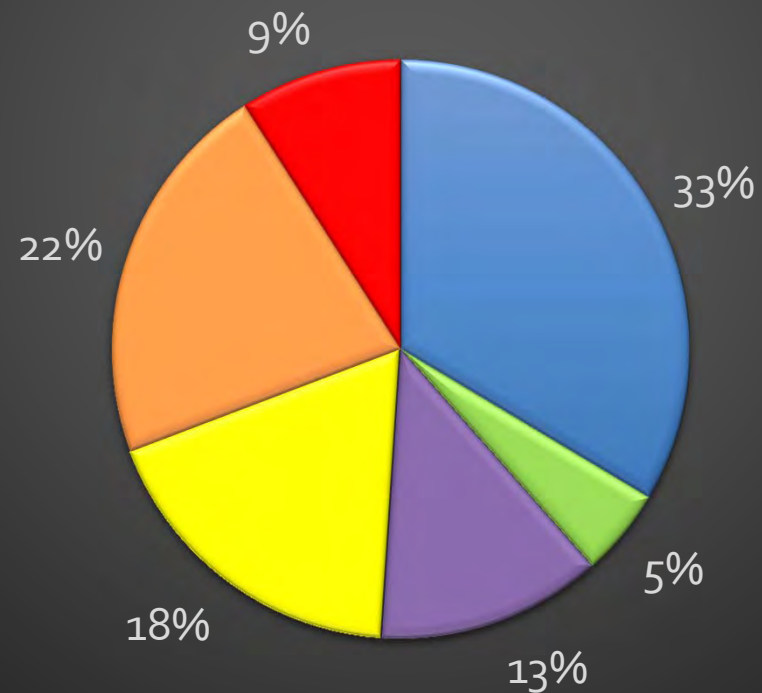
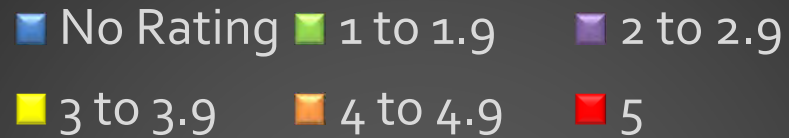
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Percentage of pipes with the overall PACP rating for recently collected CCTV data, with 1 indicating good condition through 5 indicating failing condition.

Ratings by Percentage:

1. No Rating (33%)
2. 1 to 1.9 (5%)
3. 2 to 2.9 (13%)
4. 3 to 3.9 (18%)
5. 4 to 4.9 (22%)
6. 5 (9%)

Percentage of Pipes with Overall PACP Rating





Currently On Deck

Dam / Stormwater Control Measure Inspection
Program

Automated Valve Control Pilot Project

Corrugated Metal Pipe Assessment Project

Public Utilities Collaboration



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Automated Valve Control

Initiation of Pilot Project, Lake Johnson (<\$25k)

- Tool for storm preparation
- Cell or NOAA Weather alert activated.
- Siren and flashing warning light for safety.
- Solar capable.
- Water level sensor.



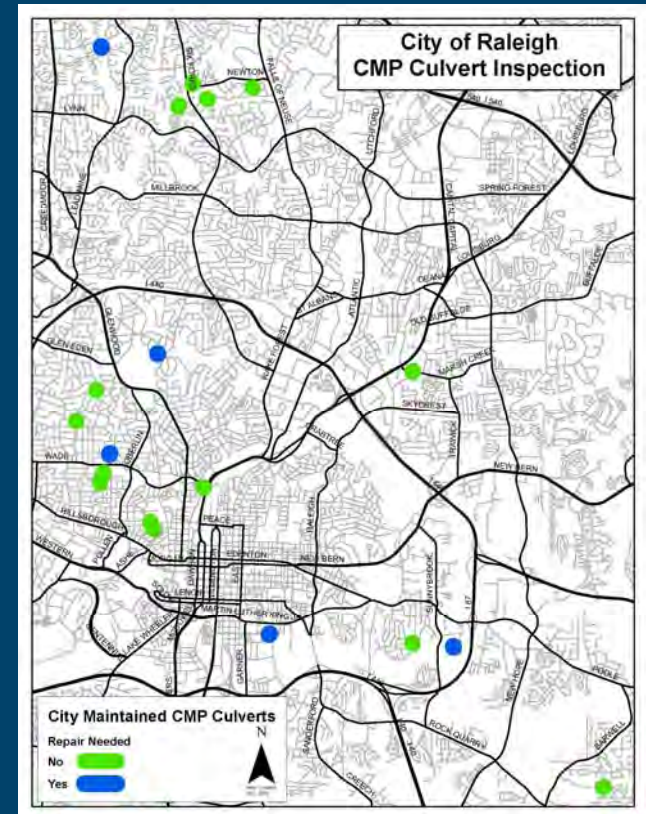


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Corrugated Metal Pipe Project

Recent Corrugated Metal Pipe Failures

- Newton Rd, Lake Wheeler, Clark Ave, etc
- We want to be more proactive than reactive.
- Mapping/GIS and TFS (?)
- Pole Camera large culverts and subsurface Corrugated Metal Pipe.
- Large culverts (>36") done. 5 out of 22 need repair.
- 4,300 segments (~364,000lf) CMP to go.





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Corrugated Metal Pipe Project

Findings

- Scotland St.





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Corrugated Metal Pipe Project

Findings

- Mayview Rd.





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Corrugated Metal Pipe Project

Findings

- Mayview Rd.





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Corrugated Metal Pipe Project

Findings

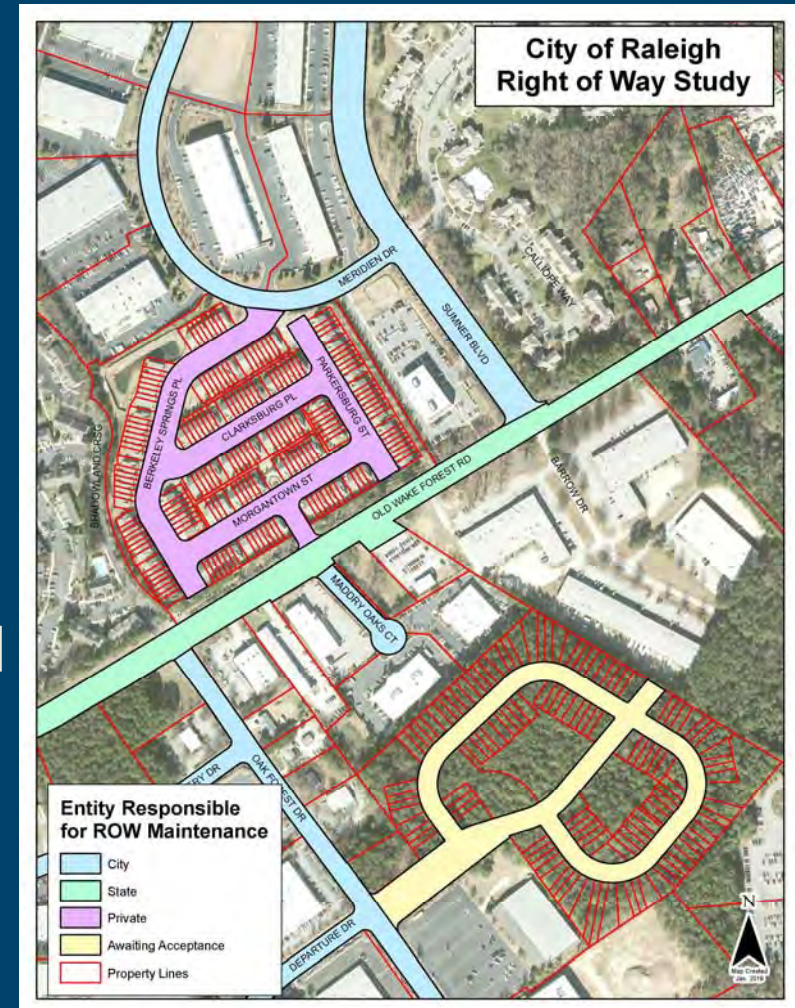
- Grant Ave





ROW Study Project

- ROW layer for current and future use.
- Correctly Identify where ROW begins and ends.
- Identify private neighborhood street areas for billing of impervious area.





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Public Utilities Collaboration

- Asset Management years ahead / well established
- Learning from experience
- Save money through better communication and coordination.
- If both have projects in same area less taxpayer dollars





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Short Term Future

- Automated Valve Control Pilot Program Results
 - Additional Dams outfitted
- Few Stormwater Control Measures need redesign / rebuild





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Short Term Future

- Lake Johnson pedestrian bridge for safety of staff
- Utilization of TFS Cityworks and CCTV data for beginning work on Stormwater Line Assessment
 - CCTV data is skewed toward a poor condition due to reactive response
 - Cannot assume all of system in same condition





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Intermediate Term Future

- Stormwater line assessment ongoing
- Investment Strategy for each type of asset





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Lessons Learned

- Avoid Silos
 - Maintenance / DOT
 - Asset Management / Stormwater
- Small Bites
 - Overwhelming, Dams and SCMs huge undertaking
- Adequate Staffing
 - Dams/SCMs
 - Watershed Management / NPDES Structures



Questions?

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