




Akron Waterways
Renewed!

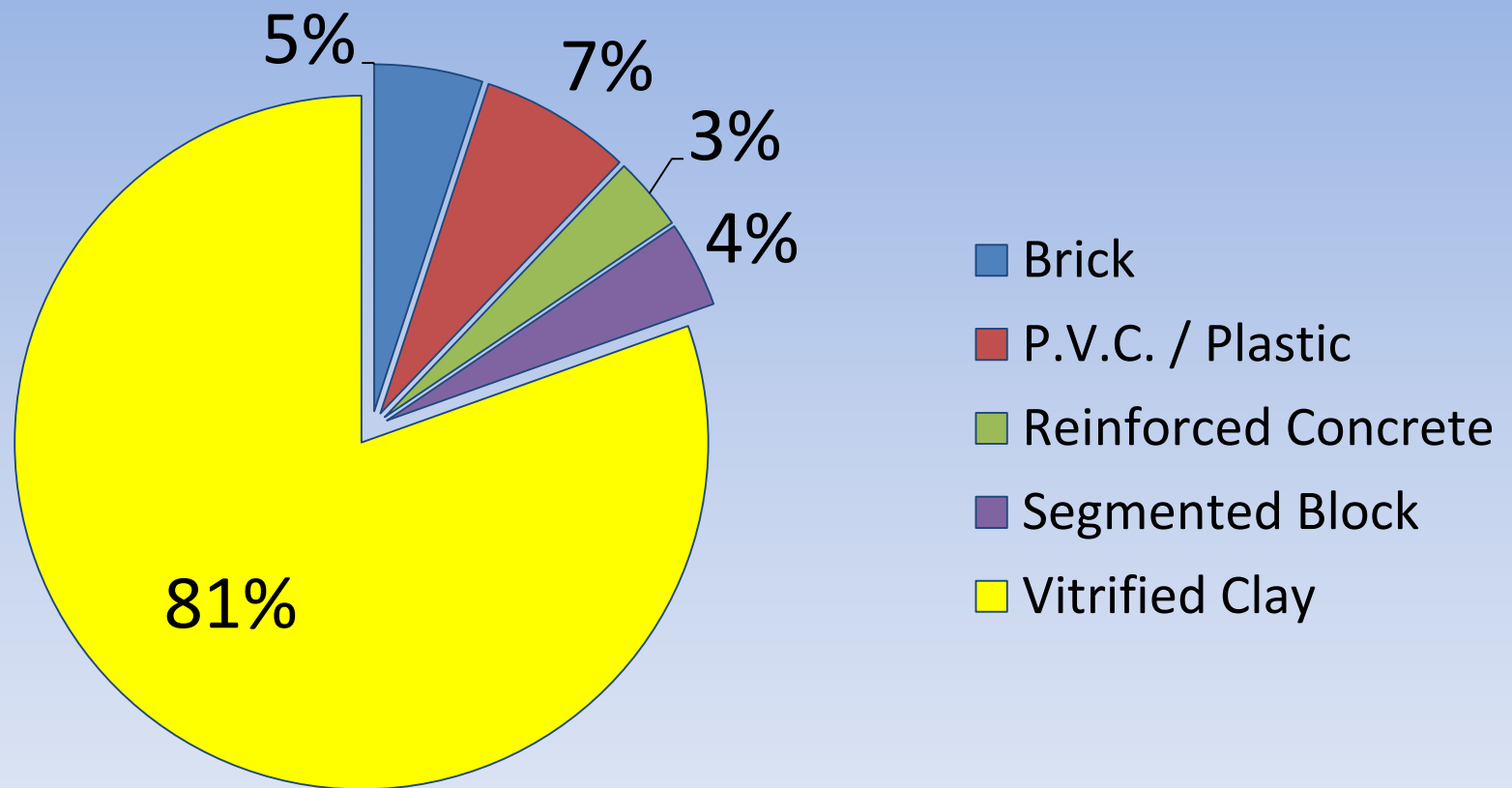
City of Akron Lessons Learned from Inspecting 847 Miles of Sewer Pipe

June 24, 2015

City of Akron

- Population: 198,100 (5th largest city in Ohio)
- 1916 first trunk sewer and treatment plant
- Combined Sewer System – 847 Miles
 - 678 Miles of Sanitary Sewers [80%]
 - 169 Miles of Combined Sewers [20%]
- 
 - 690 Miles of Small Diameter (6"-18") [82%]
 - 157 Miles of Large Diameter Sewers (20"-144") [18%]
- 18,870 Sanitary and Combined Manholes

Sewer Pipe Materials



EPA Consent Decree



- 5-year cycle to clean and inspect all sanitary and combined sewers (including manholes)
- City crews began comprehensive cleaning and inspection in 2003 and ramped up in 2008 prior to formal EPA consent decree date (2010) – **Proactive!**
- CMOM program began in 2010
 - (Capacity, Management, Operations & Maintenance)

**847 miles of sewer to clean
and inspect in 5 years...**

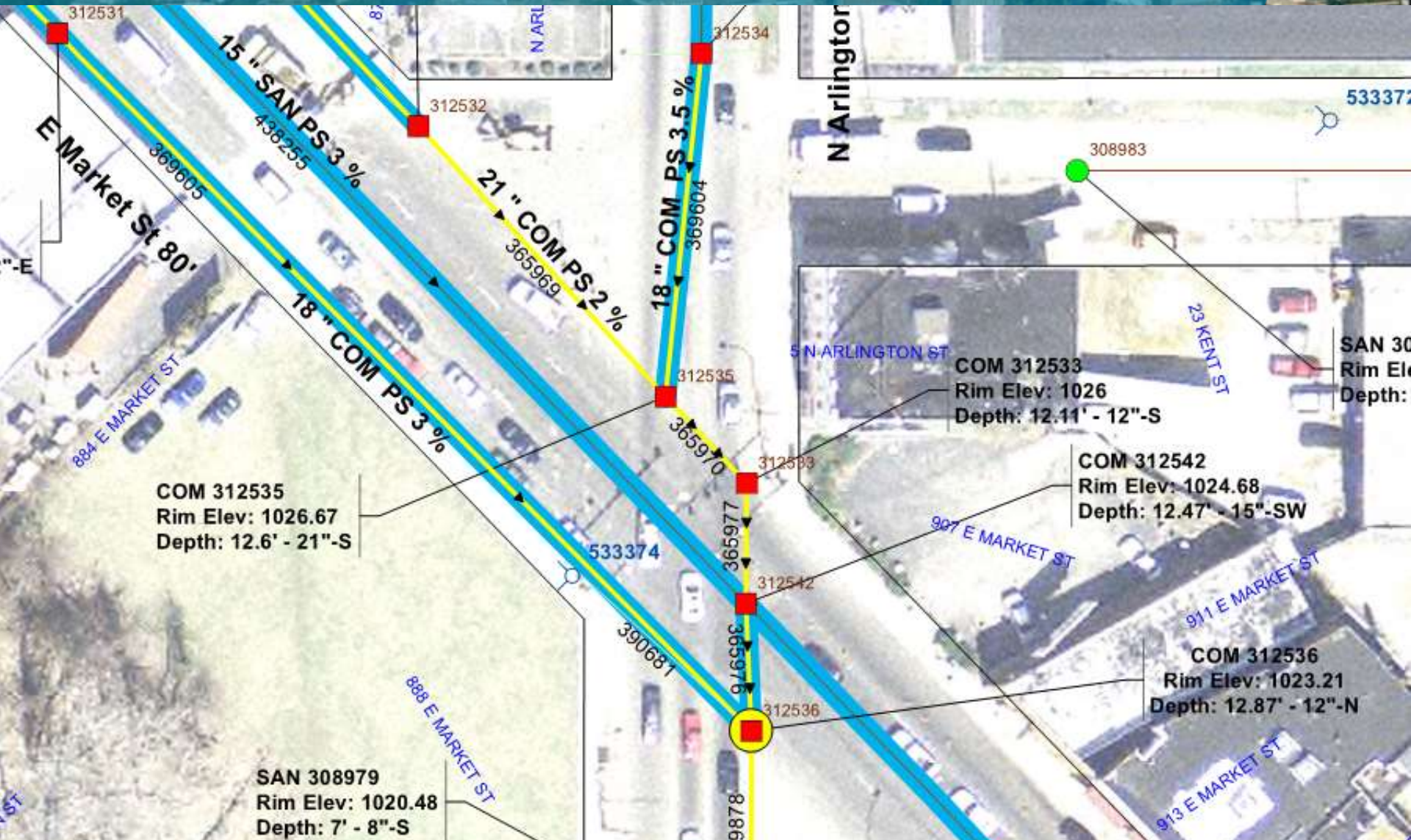
**WHERE DO WE
START?**



Contractor Interviews

- Local and national contractors contacted
 - Telephone
 - Meetings
 - Formal presentation to project team
 - Unique & large scale technology
 - Bid Items
 - Schedule feasibility
 - Past experience in City

Map Generation



NASSCO PACP Coding



- Work performed following Pipeline Assessment and Certification Program (PACP) procedures
- Contractor software needs to be compatible with the City's inspection database (RedZone ICOM3)
 - Test contractor submittals prior to mobilization to confirm compatibility

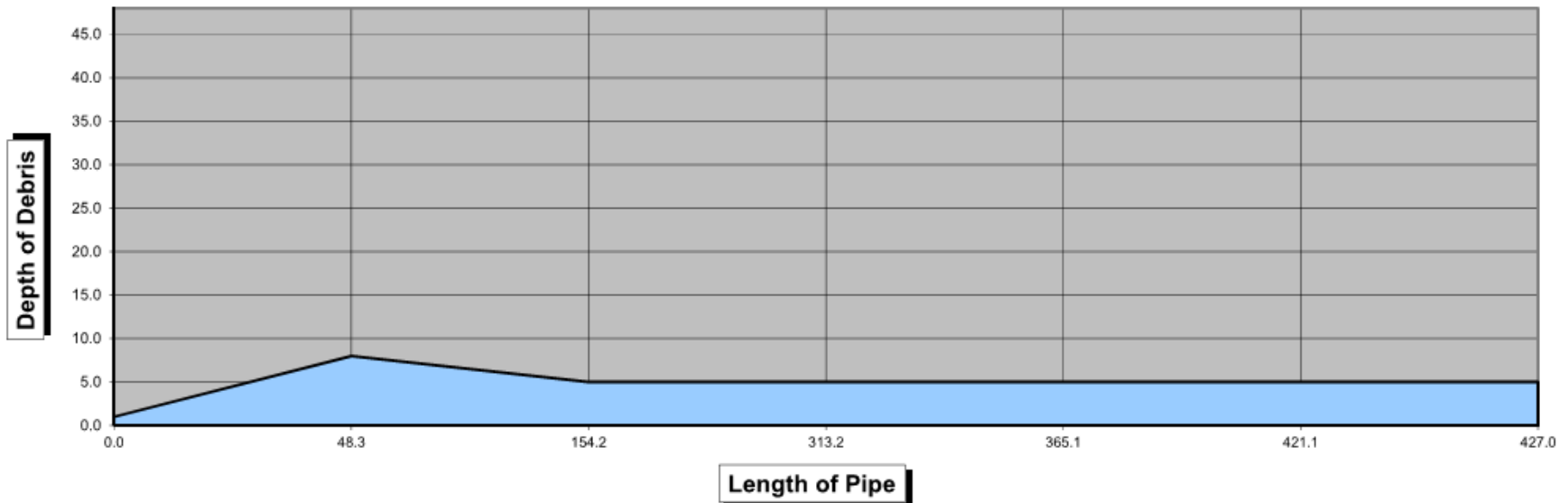
Sediment Sampling



- Required for landfill permits
- Confirm non-haz material
- Annually obtain 15 to 20 samples throughout the city
- All samples to date non-haz

Large Diameter Pre-Cleaning Inspection

- Existing conditions provided to cleaning contractors
- SONAR used to estimate sediment volumes and profiles for high flow level sewer segments



Scope and Bid Item Evolution



Pre-Cleaning Inspection?

- Small Diameter Contracts
 - No Pre-Cleaning Inspection (less sediment/debris)
- Initial Large Diameter Contracts – ***Separated!***
 - Pre-Cleaning Inspection completed 1st
 - Cleaning & Post-Inspection completed after
- Current Large Diameter Contracts – ***Combined!***
 - Pre-Cleaning Inspection, Cleaning & Post-Inspection combined into a single contract
 - Pre-inspection bid item
 - Reduce Mobilization/Increase Efficiency/Compress Schedule (less contracts)

Sewer Cleaning

- Initial Contracts
 - Acceptable level of cleaning? How defined?
 - How to handle different cleaning methods?
- Current Contracts
 - 95% clean – NASSCO Guideline
 - 100% of loose material removed
 - Hard deposits removed to within ½-inch
 - “Cleaning” vs. “Special Tools”
 - Separate bid item each

Manhole Inspection

- Initial Contracts
 - Inspections not always included in cleaning contracts
 - First efforts by City/Co-ops/Consultants
 - Paper forms often used
 - Lack of incentive for contractors (cheap bid item!)
 - Inaccessible manholes hinders inspection production
- Current Contracts
 - Tablet used for inspections (Brown & Caldwell)
 - Manholes requiring inspection included in cleaning contracts
 - Sewer segments not paid until manholes are inspected
 - Expanded allowances and specifications for providing access

Water Meters

- Large number of meters needed (+/- 15)
 - Meters break
 - Meters scarce during spring/summer/fall
 - Water Department must track
- Solution
 - Contractors purchase meters under allowance item
 - Contractors responsible for meters during project
 - Meters returned to Water Department upon project completion
- Win-Win!
 - Contractors not waiting for meters to become available
 - Eliminate tracking/coordination for Water Department
 - City gets new stock of meters



Bid Items



2014 Small Diameter (50 mi) Bid Pricing

Bid Item Description	Average Unit Price
Mobilization [LS]	\$ 22,416.67
6 Inch Sanitary Sewer Cleaning and Inspection [\$/LF]	\$ 4.66
8-10 Inch Sewer Cleaning and Inspection [\$/LF]	\$ 3.91
12-15 Inch Sanitary Sewer Cleaning and Inspection [\$/LF]	\$ 4.70
18 Inch Sanitary Sewer Cleaning and Inspection [\$/LF]	\$ 5.90
Manhole Inspection [EA]	\$ 65.83
Special Pipe Cleaning Tools (Time & Material) - Allowance	\$ 20,000.00
Manhole Rebuilt - Allowance	\$ 10,000.00
COA CMS Item 613 - Uniformed Law Enforcement Officer w/ Patrol Car - Allowance	\$ 12,000.00
Hydrant Water Meters - Allowance	\$ 5,000.00

2013 Large Diameter (44 mi) Bid Pricing

Bid Item Description	Average Unit Price
Mobilization [LS]	\$ 145,666.67
Pre-CCTV Inspection [\$/LF]	\$ 2.55
Pre-CCTV & SONAR Inspection [\$/LF]	\$ 3.53
Sewer Pipe Cleaning & Post Inspection (20"-24") [\$/LF]	\$ 10.42
Sewer Pipe Cleaning & Post Inspection (25"-36") [\$/LF]	\$ 13.01
Sewer Pipe Cleaning & Post Inspection (37"-48") [\$/LF]	\$ 26.17
Sewer Pipe Cleaning & Post Inspection (49"-60") [\$/LF]	\$ 23.07
Sewer Pipe Cleaning & Post Inspection (61"-72") [\$/LF]	\$ 30.73
Sewer Pipe Cleaning & Post Inspection (73"-96") [\$/LF]	\$ 43.60
Sewer Pipe Cleaning & Post Inspection (97" & larger) [\$/LF]	\$ 73.70
Sediment & Debris Handling & Disposal [\$/Ton]	\$ 92.17

Coordination



Coordination Partners



- City of Akron
 - Sewer Maintenance
 - Water Department
 - GIS Department
- Summit Co. MetroParks
- City Events
- Business
- Residential
- Contractor



Contractor Management

- Daily work plan coordination & email notifications
- RPR representation
- Video Review – QA/QC
- Map vs field conditions
- MOT
- Hydrant coordination
- Field assistance
 - Locating
 - Access



Sewer Cleaning & Inspection



Sewer Inspection Equipment



- CCTV/SONAR
 - Crawler
 - Floating unit
 - Push Camera
- RedZone SOLO
- Locating Sonde
 - Below grade locating



Sewer Inspection Equipment



Sewer Cleaning Equipment

Recycler – Denmark



City Jet/Vac Truck



Remote Access Equipment

2,500 Feet!



Remote Locations!

Manholes in need of Repair



Heavy Cleaning



Large Debris





AKRON, OH MARKET ST
303682 -> 303486
Brick Circular 60

258' 01"

Debris



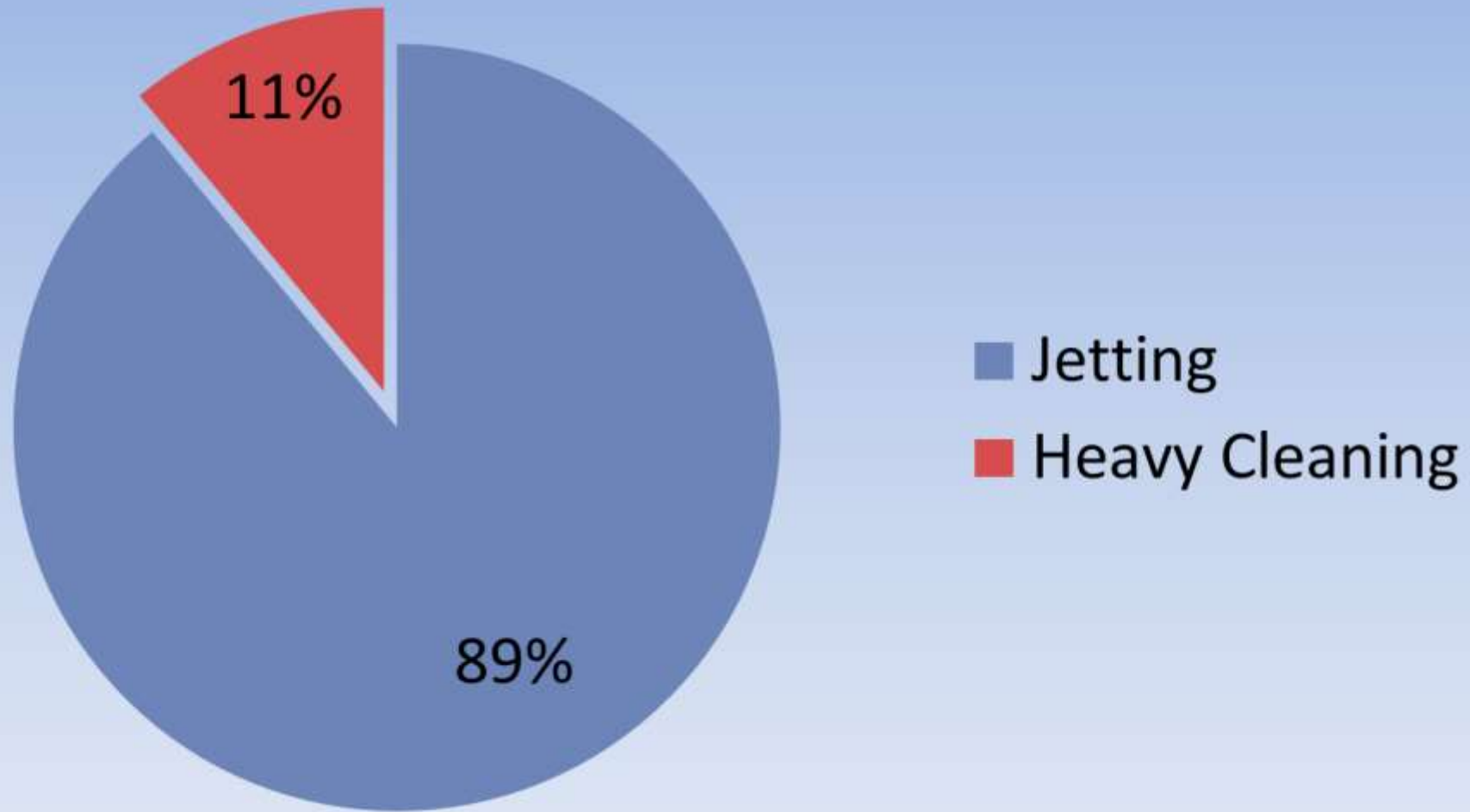
Guns



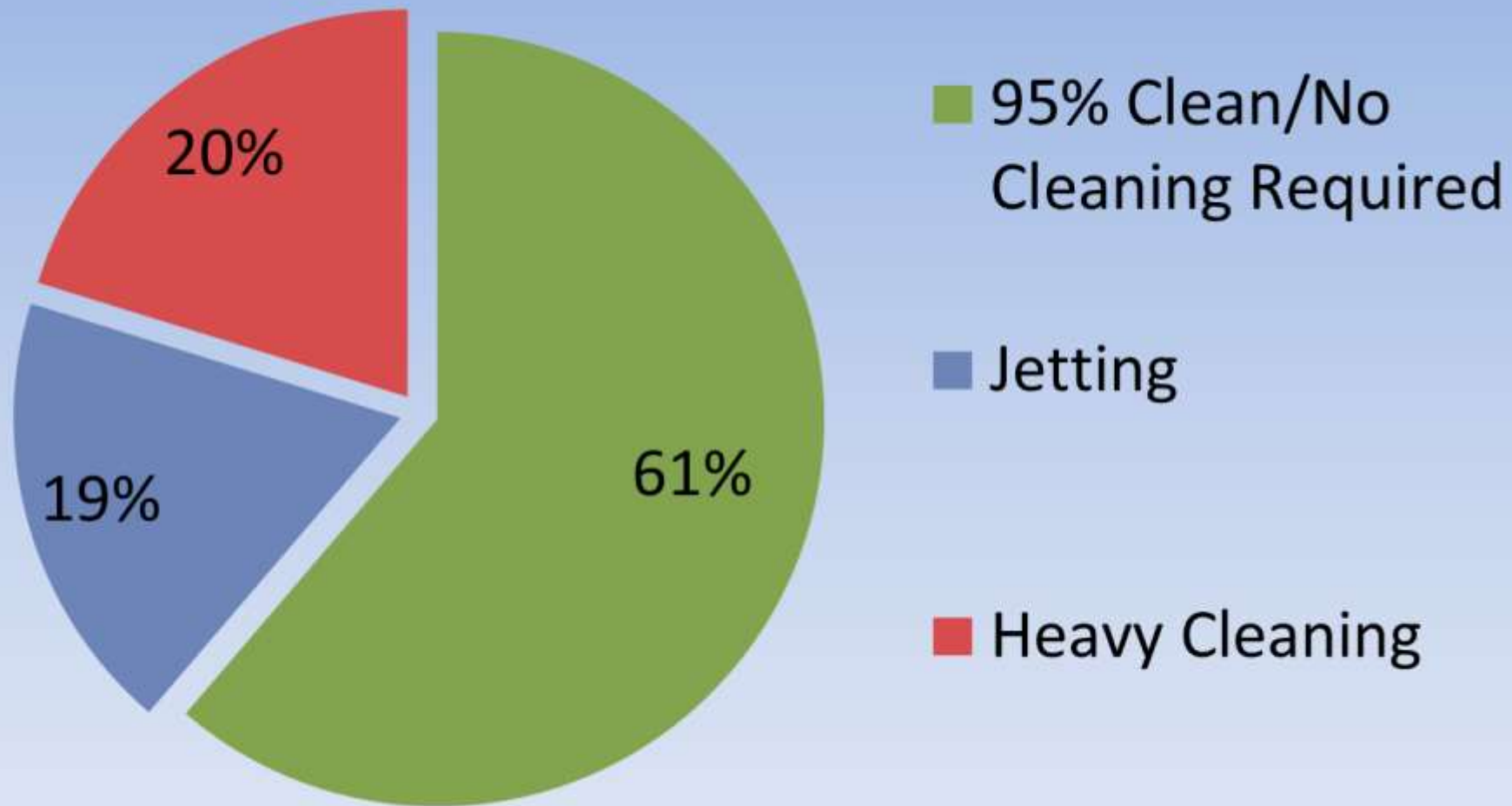
Results



Small Diameter Cleaning Operations

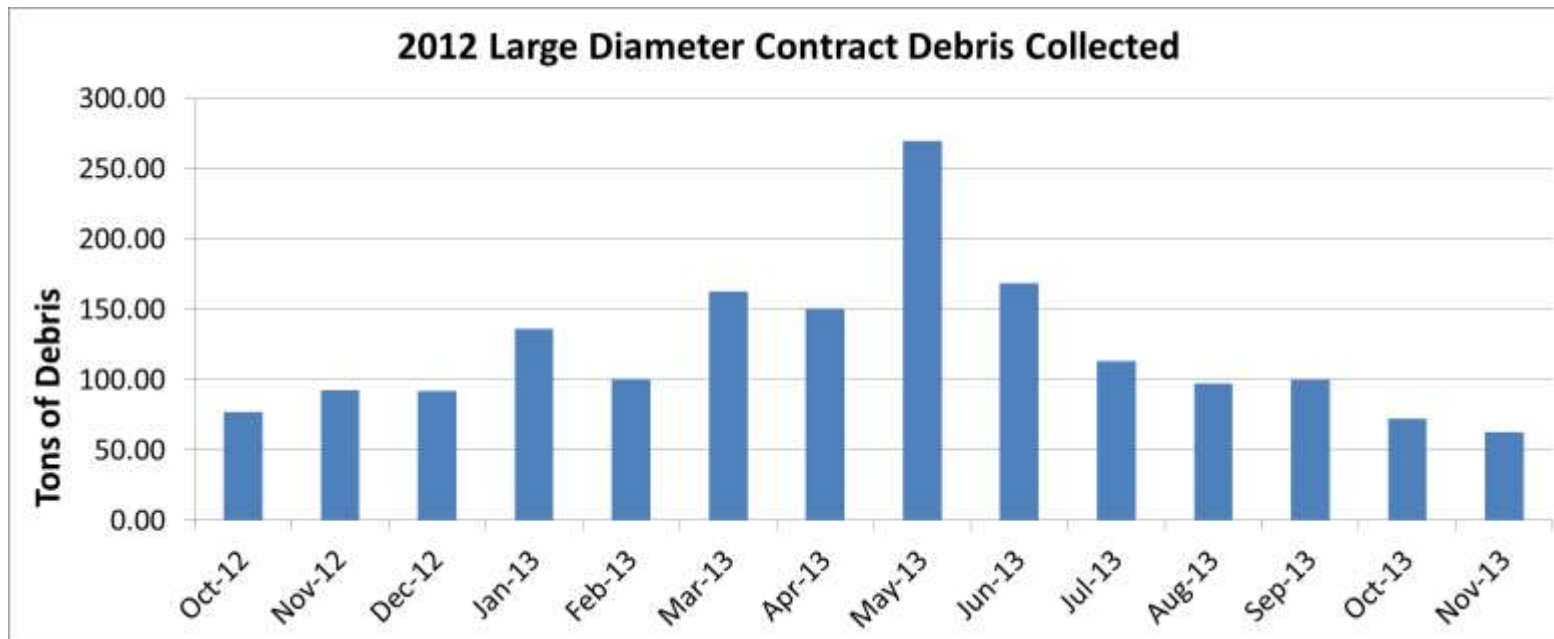


Large Diameter Cleaning Operations



Sewer Debris – Large Diameter Pipe

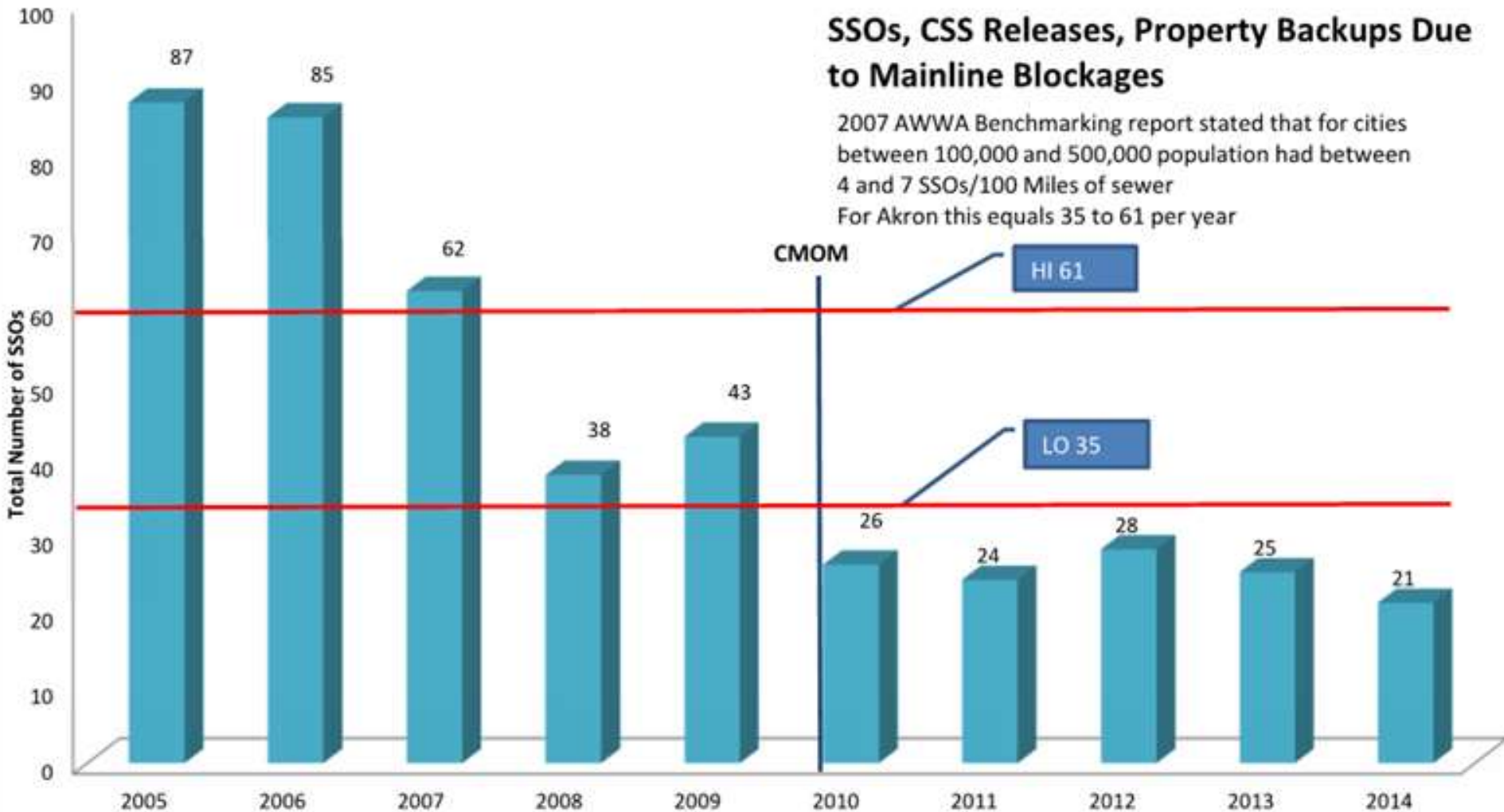
- 2012 Large Diameter Contract
 - Approximately 88,000 feet of cleaning
 - Average of 2 tons of debris for every 100 feet of cleaning



Cleaning Production Rates

- **RedZone SOLO Unit (8" – 12" Sewers)**
 - Average footage – 2,700 LF/Crew/Day
 - Maximum footage – 3,700 LF/Crew/Day
- **Small Diameter (6" – 18" Sewers)**
 - Average footage – 1,000 LF/Crew/Day
 - Maximum footage – 3,000 LF/Crew/Day
- **Large Diameter (20" – 144" Sewers)**
 - Average footage – 200 LF/Crew/Day
 - Maximum footage – 1,000 LF/Crew/Day

Sewer Functionality Improved



Summary of Lessons Learned

- Combining large diameter pre-cleaning inspection, cleaning & post-inspection into a single contract
- Required manhole inspections to be complete prior to payment for sewer cleaning
- Special Tools Cleaning Allowance
- Water meter allowance
- Coordination

Summary – Benefits of Cleaning & Inspection Program

- Many corrections to GIS mapping
- Reduced overflows/backups
 - Backups/100mi below 2007 industry benchmark
- Comprehensive PACP system condition assessment
 - Immediate repairs identified and addressed
 - Prioritization of short-term repairs
 - Will be used for longer term budget planning

Update

- The City is currently performing cleaning & inspection for a second 5-year cycle
- At least 20% of system to be completed this year
- Project locations by Sanitary Mini-District
 - Determined using PACP data from 1st 5-year cycle
- Project tracking documents and coordination further streamlined

Update – 2015 Work

- City has 3 full-time crews performing cleaning & inspection
- 1 RedZone SOLO Crew
- Contract Work
 - 3 Contractors
 - Unit pricing similar to 1st 5-year cycle

Questions?

