

Clean Smarter, Not Harder: FreeFlowH2O

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What are we talking about?

- 01 What is the challenge in sewer cleaning?
- 02 How can we manage operations to address this challenge?
- 03 How does being successful benefit utilities?

Sewer cleaning is the primary way to maintain collection system assets.



Environment



Property



Public Health



Tax Dollars

- **Over \$1 trillion** of US sewer infrastructure in service
- Between **23,000 and 75,000 SSOs** are estimated to occur each year
- Between **3 billion and 10 billion gallons** of untreated wastewater reach the natural environment
- On average, communities spend **~\$8,000 per mile** in collection system O&M
- Sewer cleaning is a significant component of this cost.

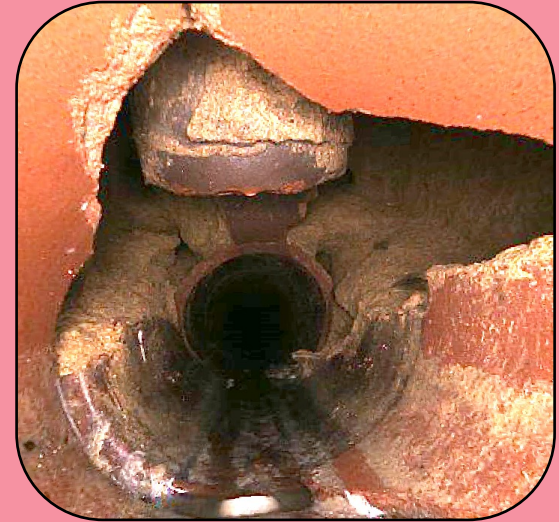
Cleaning pipes at the right time allows for optimized resource allocation.



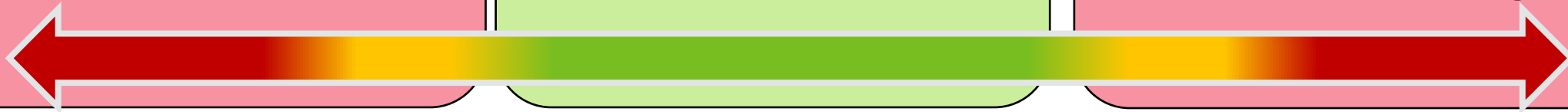
Under Cleaning



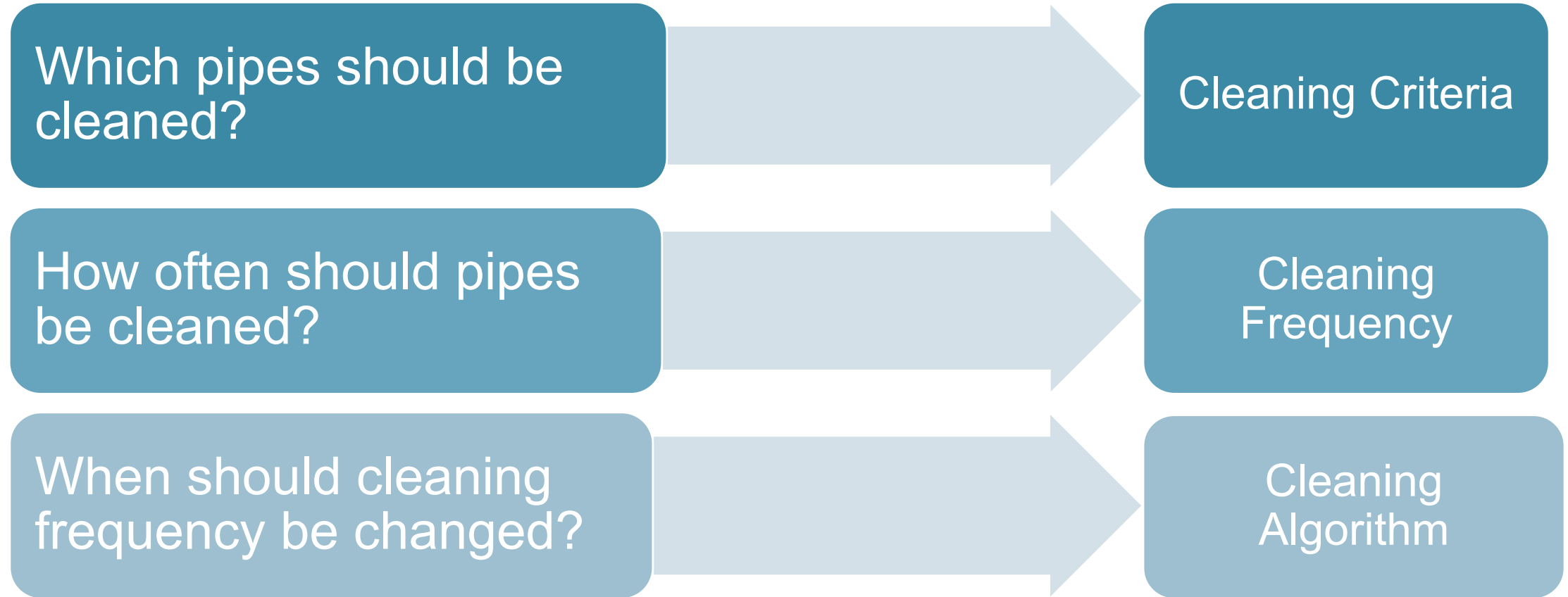
On-Time



Over Cleaning



Developing an effective cleaning program involves 3 key parts.



FreeFlowH2O combines elements of cleaning programs into a single tool.



RECOMMENDATIONS

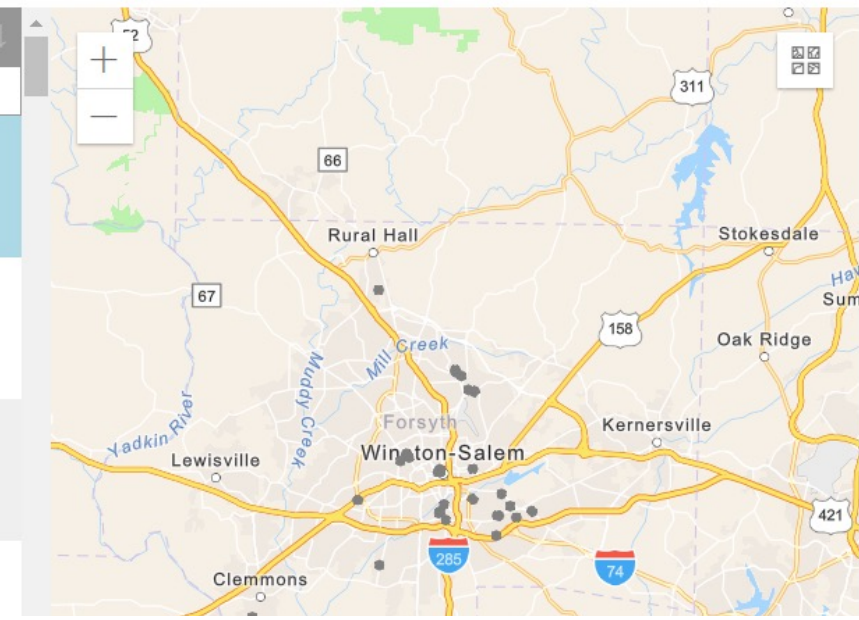
WO CREATION

WO REVIEW

RECOMMENDATIONS Approve Deny No Recommendations Activated

Search Recommendations

Asset Id	Decision Type	Old Value	Proposed Value	Cause	Date Added
<input type="checkbox"/> Search Asset I	<input type="text"/> Search Decision Ty	<input type="text"/> Search Old	<input type="text"/> Search Proposed Va	<input type="text"/> Search Cause	<input type="text"/> Search Date Add
<input type="checkbox"/> 1329011	Cleaning Frequency Change	24 months	12 months	1 Occurrences of HEAVY	5/17/2023
<input type="checkbox"/> 1315457	Cleaning Frequency Change	24 months	12 months	2 Occurrences of HEAVY	5/11/2023
<input type="checkbox"/> 2237958	Cleaning Frequency Change	24 months	12 months	1 Occurrences of HEAVY	5/17/2023
<input type="checkbox"/> 1301940	Cleaning Frequency	24 months	12 months	2 Occurrences of HEAVY	5/12/2023



FFH2O automates cleaning logic for an organized way to manage O&M programs.

ASSETS

Search Assets

Successfully checked Cityworks, but found no updates.

Asset Id	Maintenance Group	Pipe Diameter	Pipe Type	Pipe Length	Pipe Material	Cleaning Frequency	Next Cleaning
1286110	FM1505	8	UNSPEC	199.36	VCP	120 months	5/5/2031
1297000	FM1002	8	COLLEC	198.85	VCP	120 months	6/19/2026
1328841	FM1904	8	COLLEC	369.91	VCP	24 months	10/1/2023
1314781	FM0704	8	UNK	416.65	VCP	12 months	6/2/2022
1310679	FM0101	8	COLLEC	213.4	VCP	120 months	1/10/2032
2305133	UNK	8	COLLEC	162.51	VCP	120 months	8/5/2024
1298421	FM0301	8	COLLEC	153.88	VCP	60 months	9/26/2024
1320204	FM0304	8	COLLEC	205.3	VCP	120 months	1/30/2027
1326938	FM1601	8	COLLEC	293.27	VCP	60 months	4/13/2023
1310874	FM1505	15	OUTFAL	165.32	VCP	120 months	8/12/2030

Visualize Maintenance Group Systemwide Hotspot

Footage Selected: 0 | Assets Selected: 0

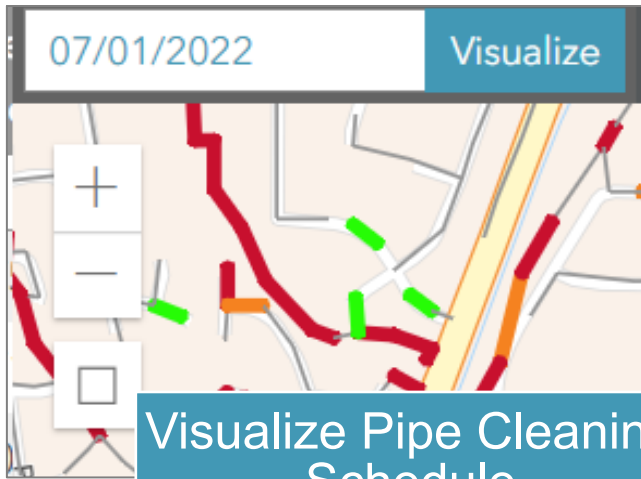
Create Workorder

Access to Asset Information

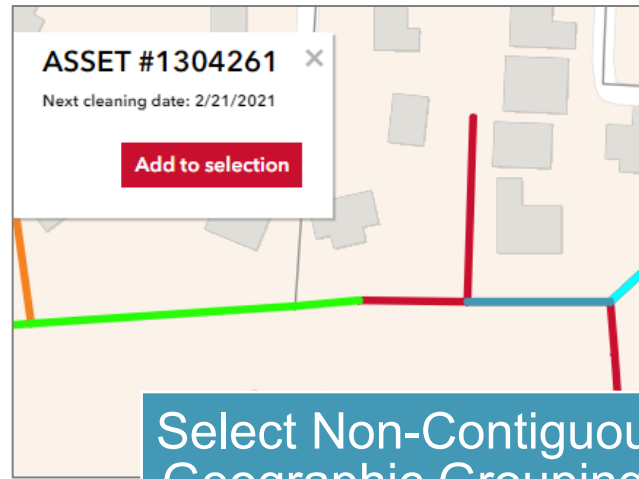
Source for Cleaning Schedule Data

Graphic Interface to Select and Schedule O&M

This simplifies cleaning decisions for collection system O&M programs.



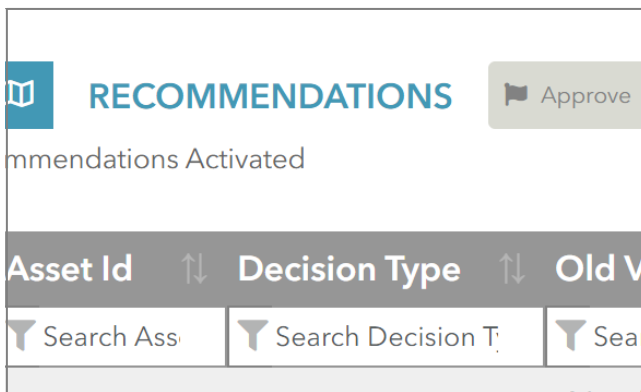
Visualize Pipe Cleaning Schedule



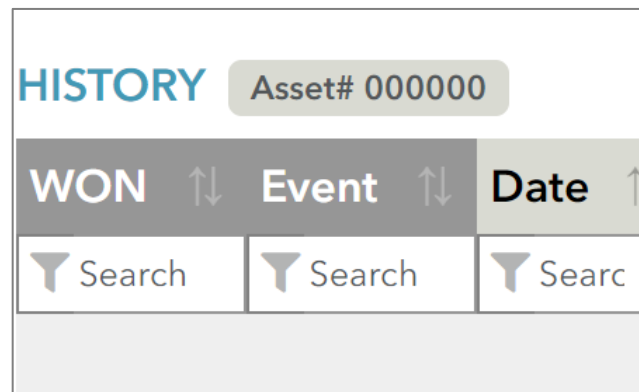
Select Non-Contiguous Geographic Groupings



Adjust Pipe Status



Process Recommendations

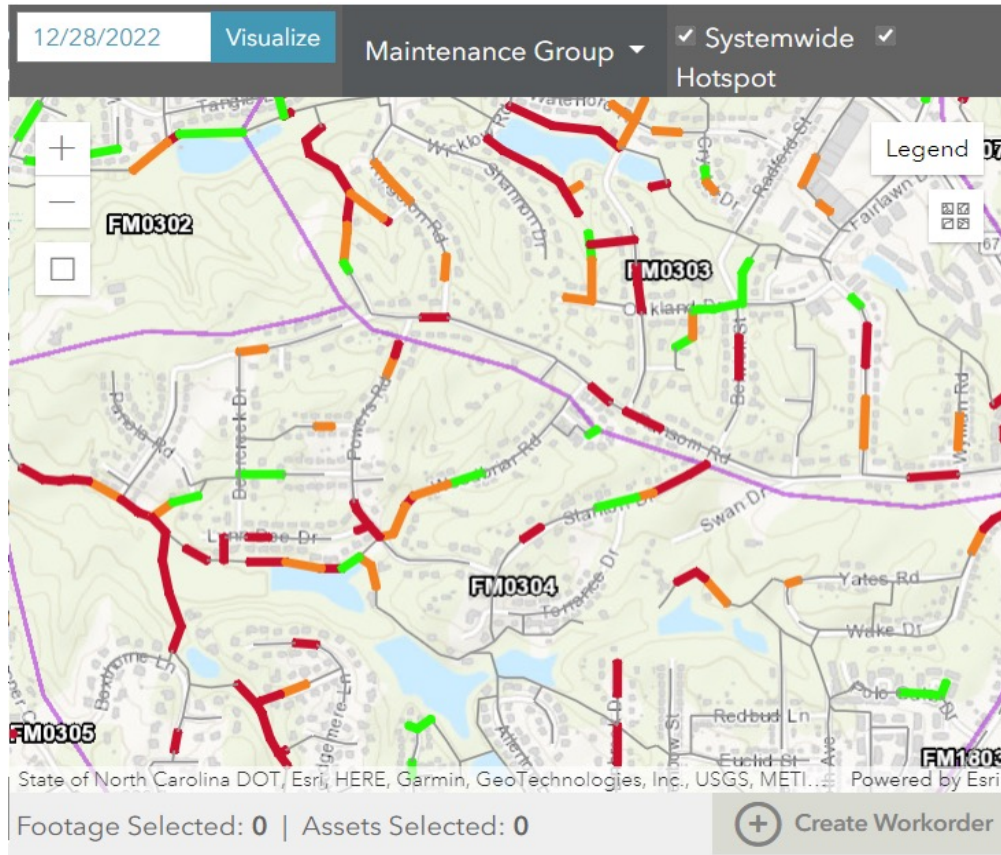


Review Asset History

WO ID	Status	Count of Ass
Search WO I	Search Status	Search Coun
	PENDING	
	PENDING	
1148041	OPEN	
1148145	OPEN	
11544		
11559		

Manage Workflows

Visualizing the pipe schedule allows for intuitive decision making.



Lead Date

Scheduled Cleaning

Lag Date

Early

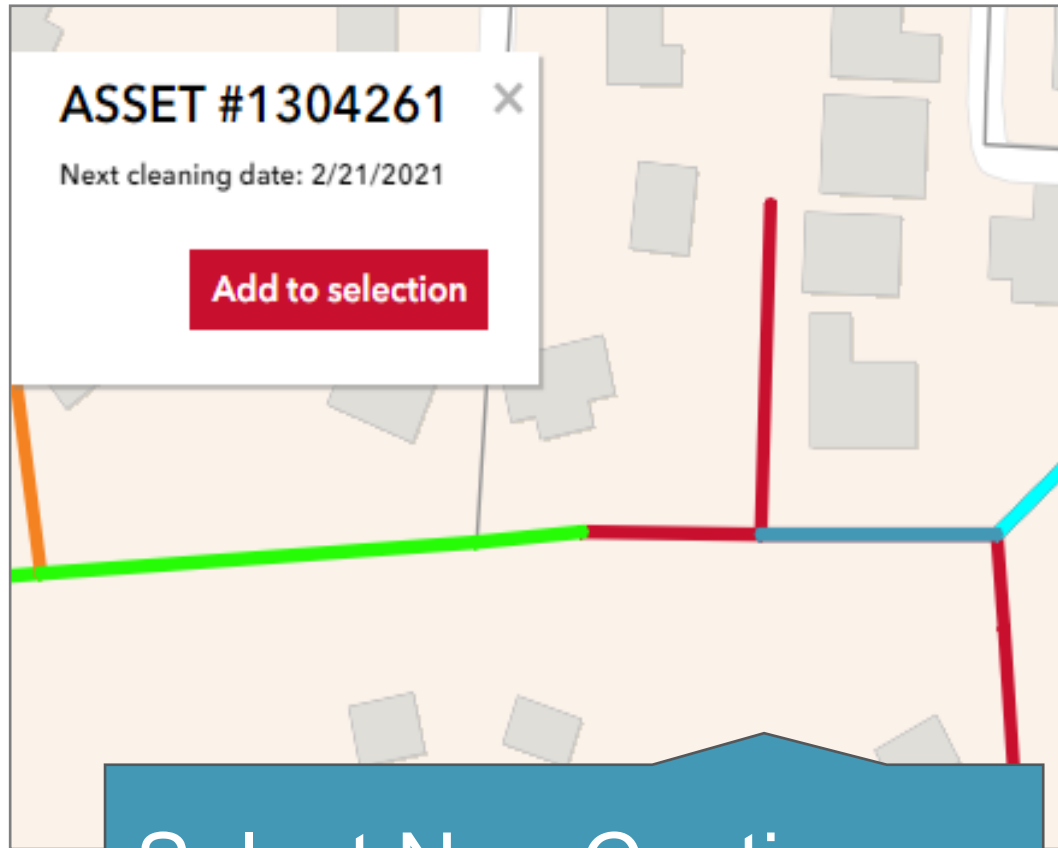
Lead Window

Lag Window

Overdue

Cleaning Frequency	Lead Days	Lag Days
None	0	0
1 month	-7	7
3 months	-21	21
6 months	-42	42
12 months	-84	84
24 months	-168	168
60 months	-180	180
120 months	-180	180

Streamlining work order creations improves implementation.



Select Non-Contiguous Geographic Groupings

A screenshot of a data table interface. The table has three columns: 'WO ID', 'Status', and 'Count of Ass'. Below the column headers are search filters: 'Search WO I', 'Search Status', and 'Search Coun'. The table contains several rows of data, including 'PENDING' status entries and 'OPEN' status entries with specific WO IDs.

WO ID	Status	Count of Ass
<input type="text" value="Search WO I"/>	<input type="text" value="Search Status"/>	<input type="text" value="Search Coun"/>
	PENDING	
	PENDING	
1148041	OPEN	
1148145	OPEN	
1154444	OPEN	
1		

Manage Workflows

Managing schedule adjustment optimizes effectiveness.

RECOMMENDATIONS Approve

Recommendations Activated

Asset Id	Decision Type	Old Value
<input type="text"/>	<input type="text"/>	<input type="text"/>

No data

Process Recommendations

HISTORY Asset# 000000

WON	Event	Date
<input type="text"/>	<input type="text"/>	<input type="text"/>

Review Asset History

Current Frequency: 120 months

Schedule Type:

Current Schedule: Dynamic

Status:

Current Status: Active

Next Cleaning Date:

Current Next Cleaning Date: 11/16/2031

Locked:

Adjust Pipe Status

FreeFlowH2O is one tool to help optimize collection system O&M.

Asset Information

- Location
- Diameter
- Work History

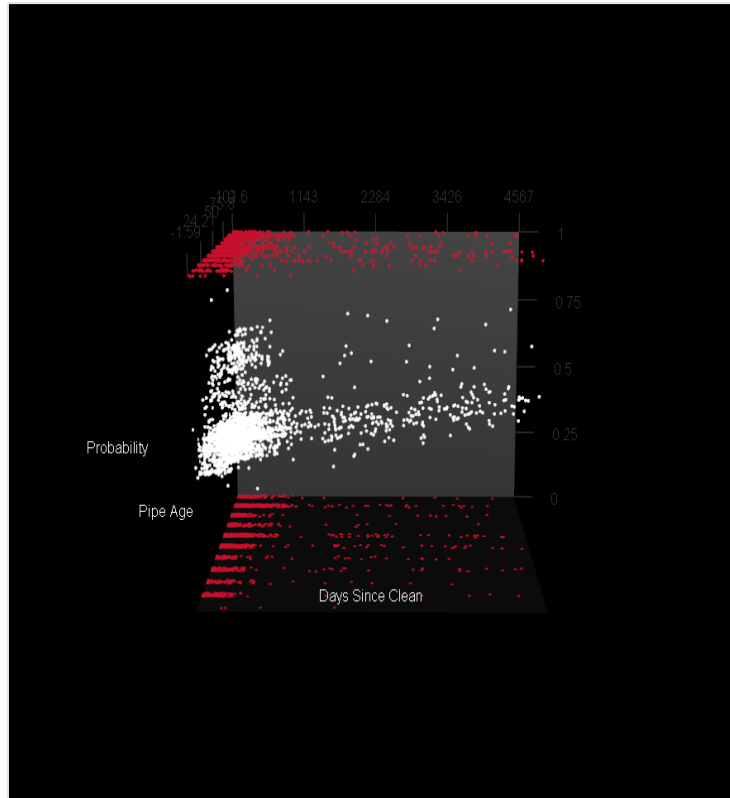
Cleaning Strategy

- Criteria
- Frequency
- Algorithm

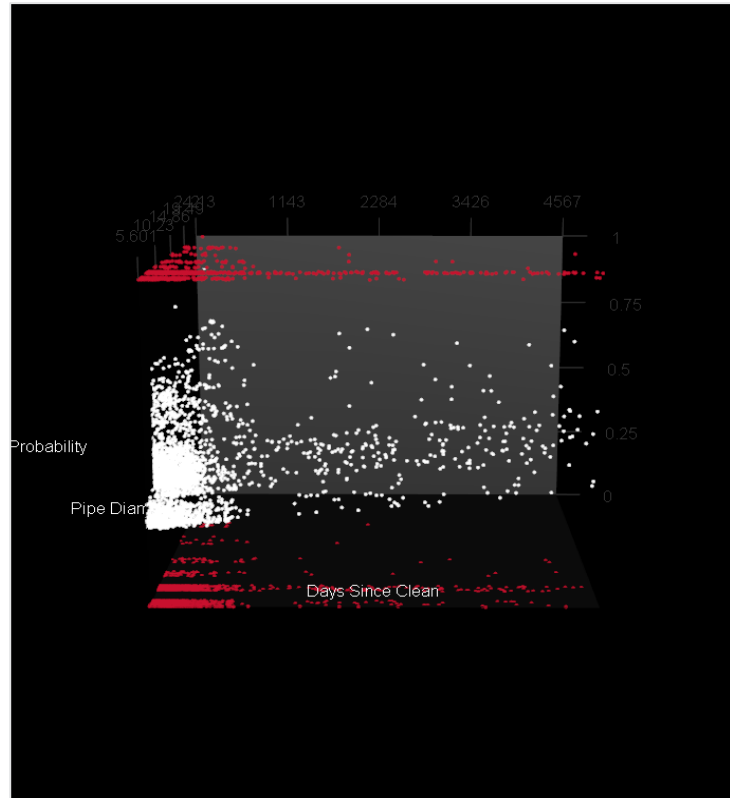
Human Resources

- Planner
- Field Staff
- IT Support

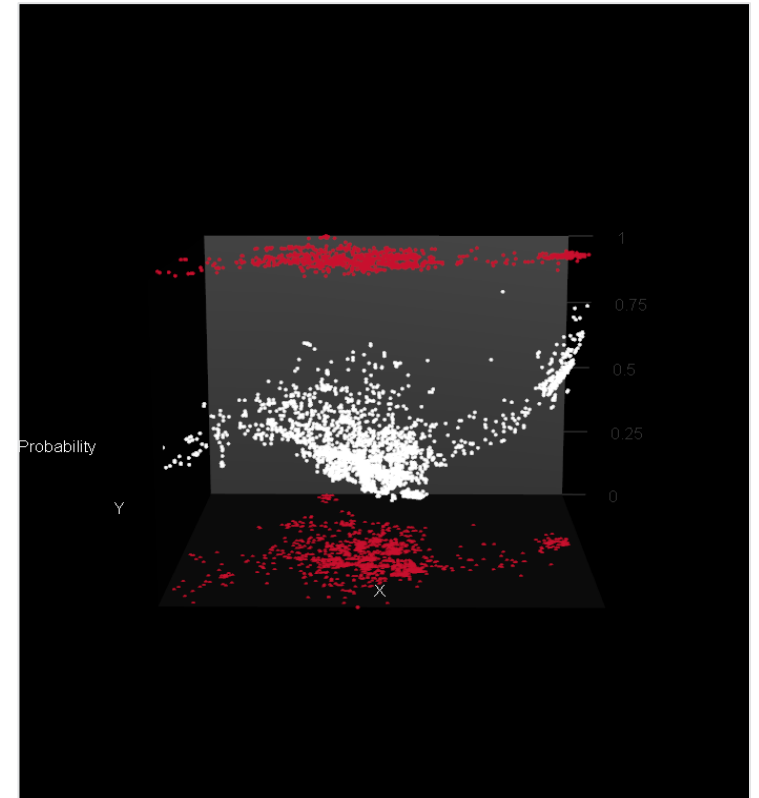
Future versions of the tool will leverage predictive analytics.



Last Cleaned & Asset Age

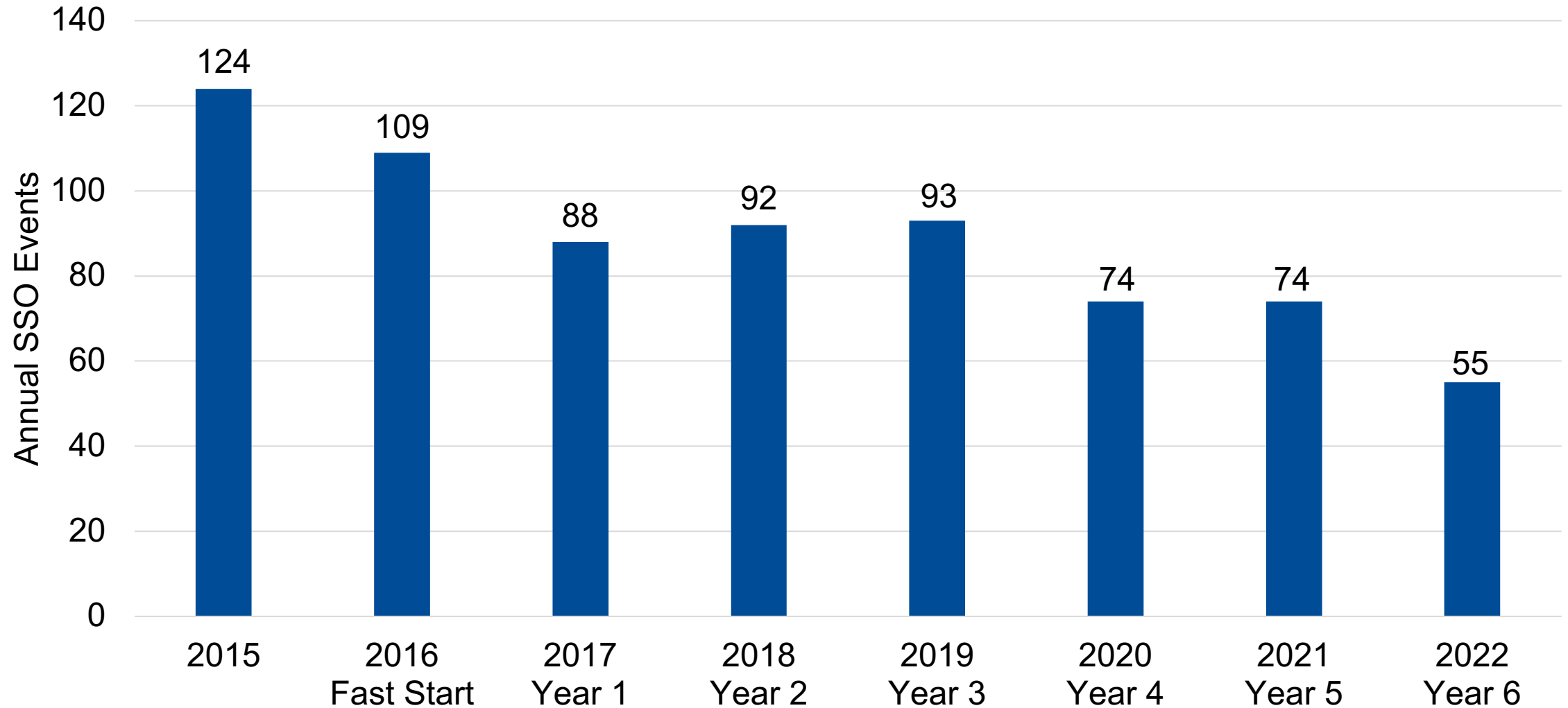


Last Cleaned & Pipe Dia.



Physical Location

FFH2O has resulted in a drastic decrease in SSOs for utilities.



Utilities can generate meaningful value by optimizing O&M programs.



Mitigate CSO/SSOs

Improved Regulatory
Performance



Transition to Proactive Work

Lower Cost of Maintenance



Less Customer Calls

Better Level of Service

Questions?

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