



HOUSTON CROSS-CONNECTION CONTROL PROGRAM

EFRAIN TORRES

DIVISION MANAGER – CROSS CONNECTION CONTROL PROGRAM
HOUSTON WATER

TREEO
CROSS-CONNECTION CONTROL CONFERENCE
FEBRUARY 3, 2025



OUTLINE

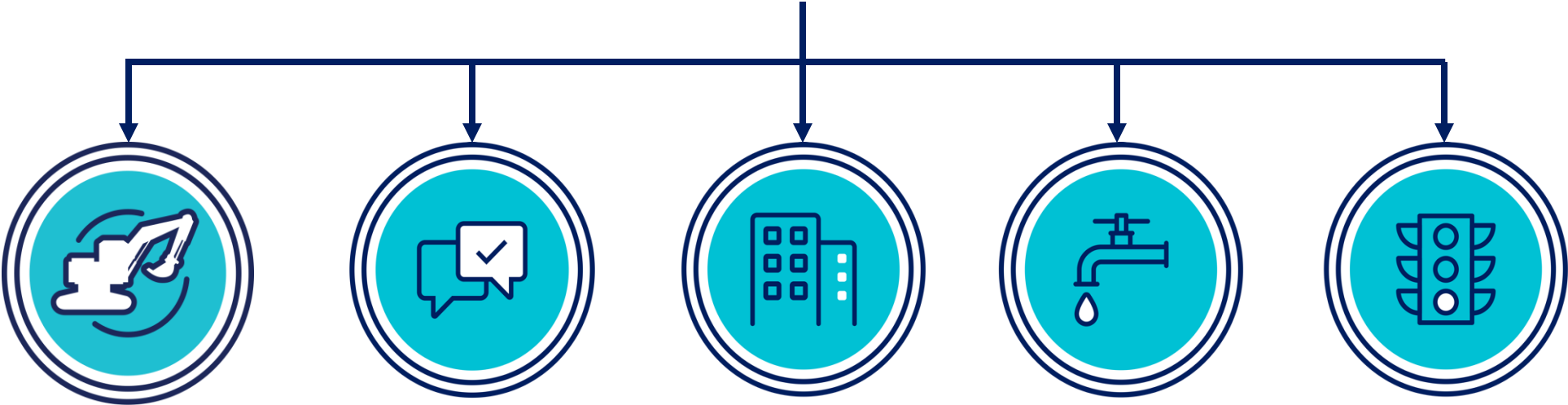
- **Houston Water**
- **State and Local Requirements**
- **Approach**
- **Performance**
- **Vision**



DEPARTMENT AND SERVICE LINES



HOUSTON PUBLIC WORKS



**CAPITAL
PROJECTS**

**CUSTOMER
ACCOUNT
SERVICES**

**HOUSTON
PERMITTING
CENTER**

**HOUSTON
WATER**

**TRANSPORTATION
AND DRAINAGE
OPERATIONS**

PROGRAM'S PURPOSE

Houston's Cross Connection Control Program is dedicated to maintaining the quality of the city's drinking water supply serving 2.3 million customers by ensuring there is proper backflow protection installed and maintained.

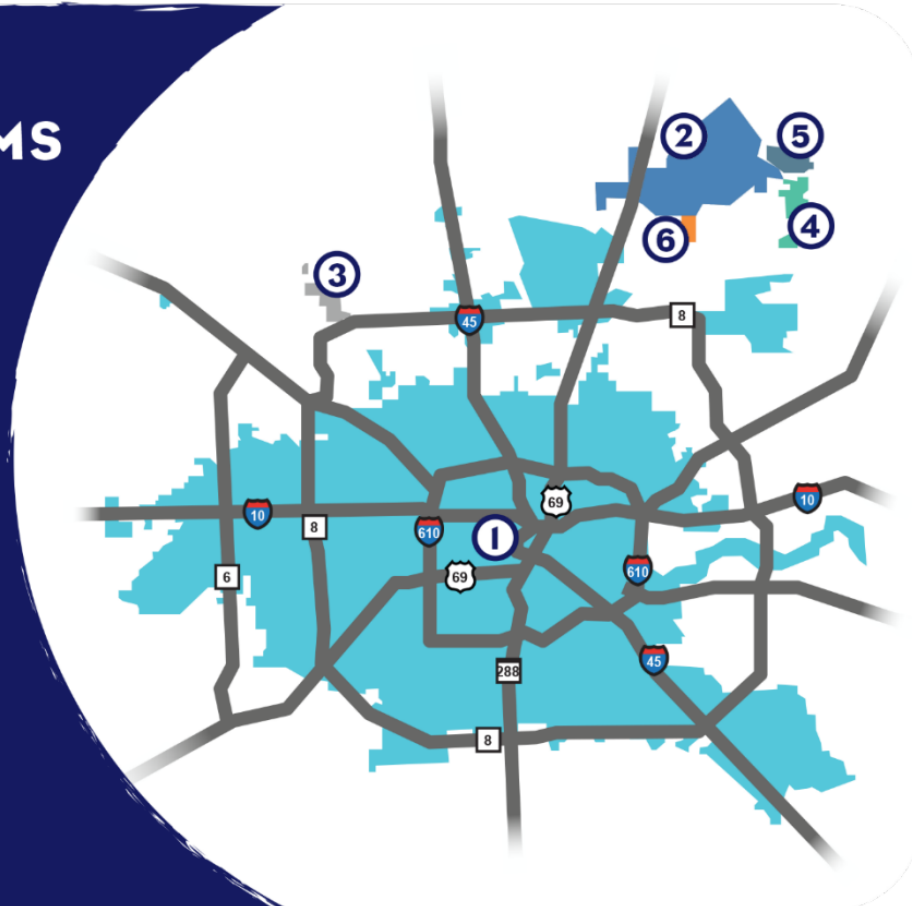


HOUSTON'S PUBLIC WATER SYSTEMS

Over **7,000 Miles** of distribution pipeline

CITY OF HOUSTON PUBLIC WATER SYSTEMS

- 1 Main System | TX1010013
- 2 Kingwood | TX1010348
- 3 Willowchase | TX1011902
- 4 District 73 | TX1011585
- 5 District 82 | TX1011593
- 6 Belleauwoods | TX1011594



- 7 Lake Houston | TX1011587

HOUSTON'S SYSTEMS BY THE NUMBERS

MAIN SYSTEM | TX1010013

Ground Water
13.5%



Surface Water
86.5%



SURFACE WATER SOURCE

San Jacinto River (Lake Conroe & Lake Houston)
Trinity River (Lake Livingston)



GROUND WATER SOURCE

104 Wells (Evangeline & Chicot Aquifers)
at depths greater than 750 feet



AVERAGE DAILY WATER PRODUCED

464M gallons



CUSTOMERS

2.2M

District 73 | TX1011585



Ground Water
100%



GROUND WATER SOURCE

2 Wells (Evangeline & Chicot Aquifers)
at depths greater than 750 feet



AVERAGE DAILY WATER PRODUCED

436K gallons



CUSTOMERS

6.2K

Kingwood | TX1010348



Ground Water
100%



GROUND WATER SOURCE

16 Wells (Evangeline & Chicot Aquifers)
at depths greater than 750 feet



AVERAGE DAILY WATER PRODUCED

8M gallons



CUSTOMERS

80.5K

District 82 | TX1011593



Ground Water
100%



GROUND WATER SOURCE

2 Wells (Evangeline & Chicot Aquifers)
at depths greater than 750 feet



AVERAGE DAILY WATER PRODUCED

109K gallons



CUSTOMERS

945

Willow Chase | TX1011902



Ground Water
100%



GROUND WATER SOURCE

5 Wells (Evangeline & Chicot Aquifers)
at depths greater than 750 feet



AVERAGE DAILY WATER PRODUCED

2.5M gallons



CUSTOMERS

13.2K

Belleau Woods | TX1011594



Purchased from City of Humble
100%

MIXED SURFACE WATER & GROUND WATER SOURCES



AVERAGE DAILY WATER PRODUCED

150K gallons



CUSTOMERS

399

STATE AND LOCAL REQUIREMENTS



TEXAS REGULATIONS

Public Water Systems (PWS) Requirements

Adopt

- Plumbing Ordinance, Regulations, or Service Agreements

Backflow prevention assembly (BPA) testing

- Upon and installation and repair
- **Annually** for BPAs protecting against **contaminants/health hazards**

Record Retention

- BPA Test Reports (3 years)
- CSI Reports (10 years)



TEXAS REGULATIONS

Public Water Systems (PWS) Requirements

Customer Service Inspections (CSI)

- Inspection of a facility to identify:
 - Piping material
 - Internal cross-connection hazards
 - Containment backflow protection
(if applicable)
- CSIs conducted for:
 - New Service Connections
 - PWS has suspicions of internal hazards
 - Construction Improvements



TEXAS REGULATIONS

Internal vs Containment Protection

Internal Protection

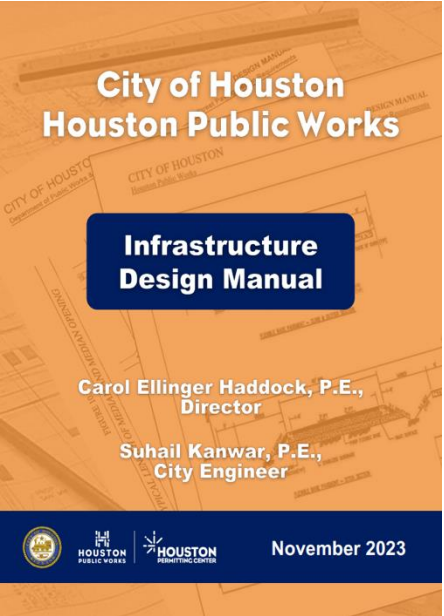
- Cross-connection hazards inside a location must have proper backflow protection as noted in Appendix F

Containment Protection

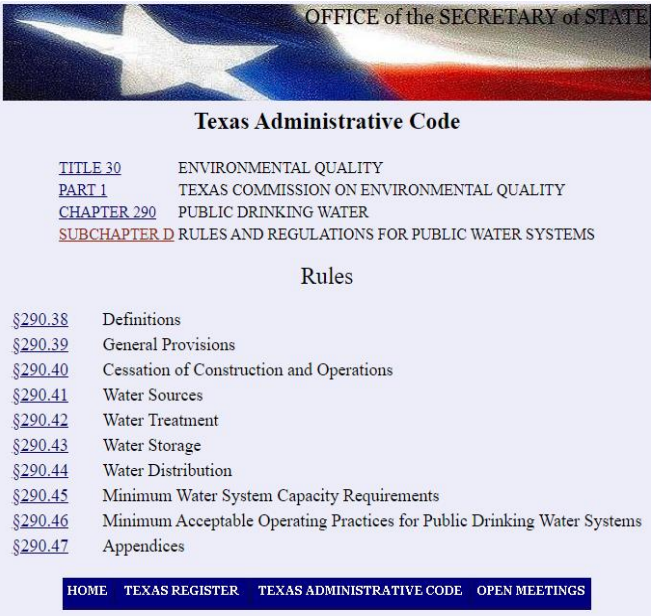
- RPZ or airgap at main water connection
- Not required if location has an adequate internal cross-connection control program
 - Periodic CSI's
 - Follow state's BPA requirements



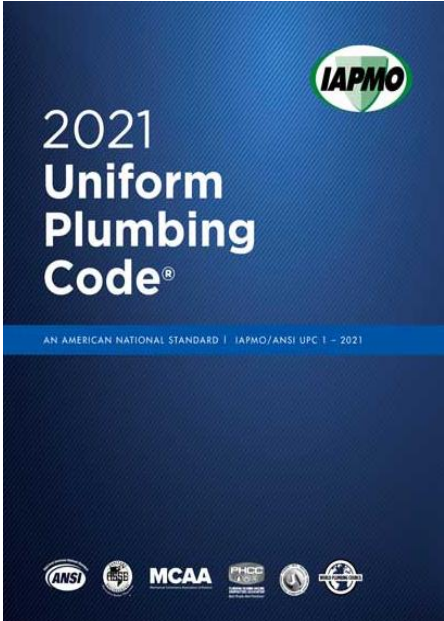
HOUSTON REGULATIONS



Infrastructure Design Manual



Texas State Code



Uniform Plumbing Code

HOUSTON REGULATIONS

Requirements for Water Customers

Internal and Containment Protection

- Have proper BPA at all internal hazards
- Require an RPZ or airgap on main water service connections for high-risk type of locations

Inspect and Test all BPAs (**health and non-health**)

- Installation
- Repair
- **Annually**

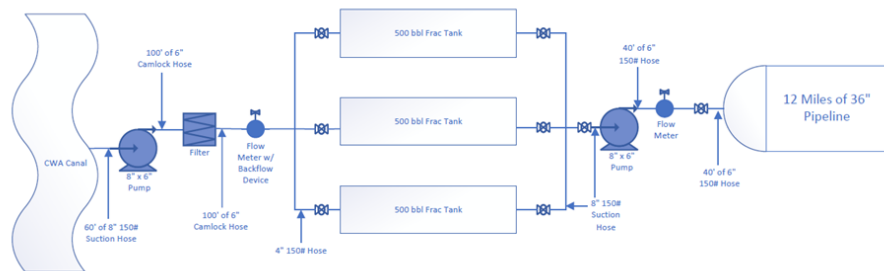


APPROACH

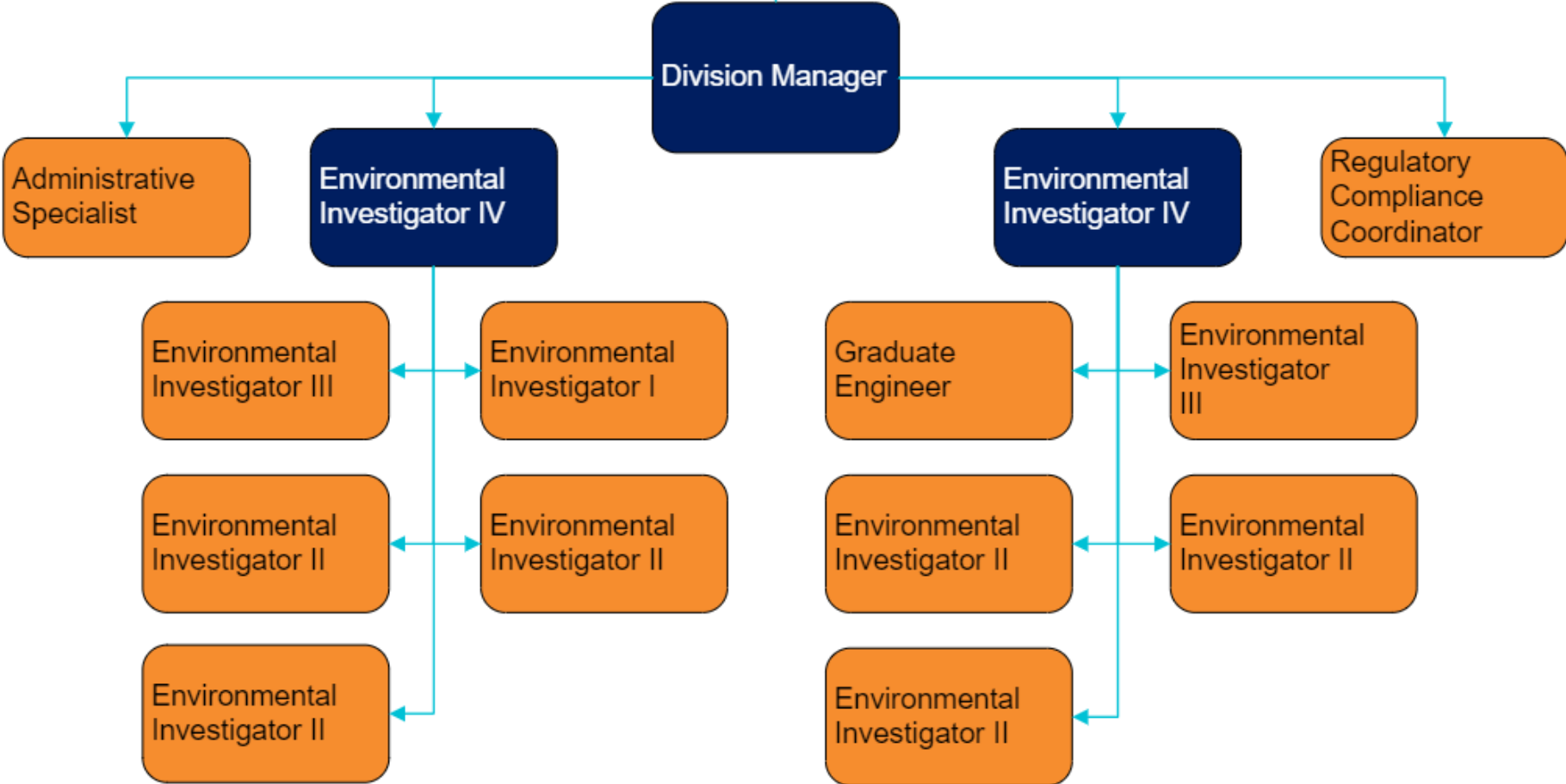


INTER-DEPARTMENTAL COMMUNICATION

- Building Code Enforcement
- Office of the City Engineer
- Water Planning
- Municipal Courts



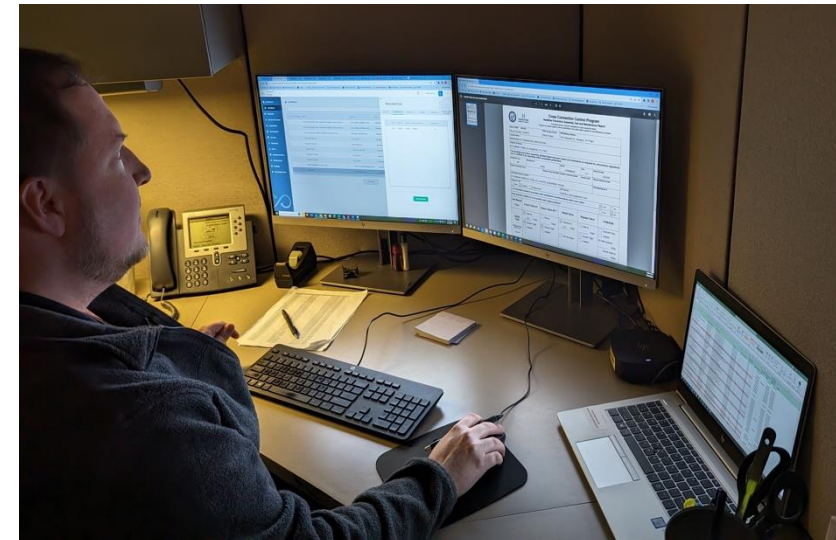
PROGRAM'S STRUCTURE



OFFICE PERSONNEL

Administrative Specialist and Regulatory Compliance Coordinator

- Answer compliance inquiries from the public
- Review test reports
- Tester registrations
- Tester Compliance Analysis
- Update location records
- Log citations and court subpoenas
- Purchasing
- Onboarding, and offboarding of new employees



OFFICE PERSONNEL

Environmental Investigator IVs

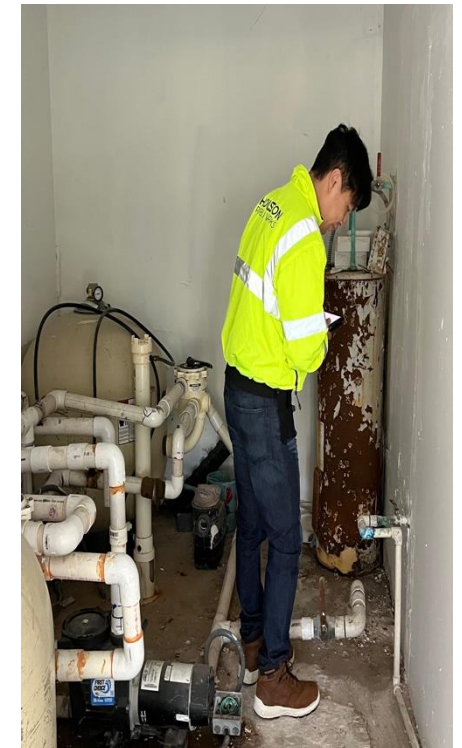
- Answer compliance inquiries
- Review daily activities and investigations from direct reports
- Assist direct reports with field complications
- In-depth customer search
- Data analysis
- Field employee coordination
- Biweekly program meetings
- Field investigations



FIELD PERSONNEL

Environmental Investigators

- Cross-connection investigations
 - Unscheduled
- Special projects/concerns
- 80% in the field
- Issue enforcement and attend court
- **\$2,000** max fine amount per violation
- Update location records
- Coordinate with large accounts



FIELD PERSONNEL

Inspection Types

Customer Service Inspections (CSI)

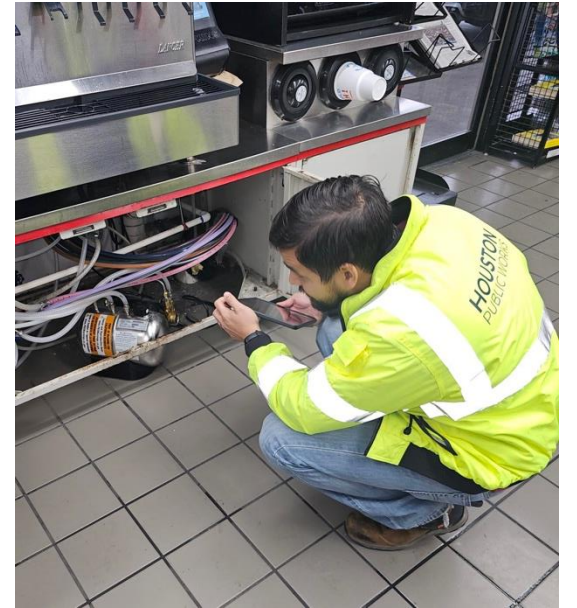
- Cross-connections and piping material are identified

Cross-Connection Control Survey (CCS)

- Cross-connections are identified

Corrective Action Form (CAF)

- Location fell out of compliance with testing



FIELD PERSONNEL

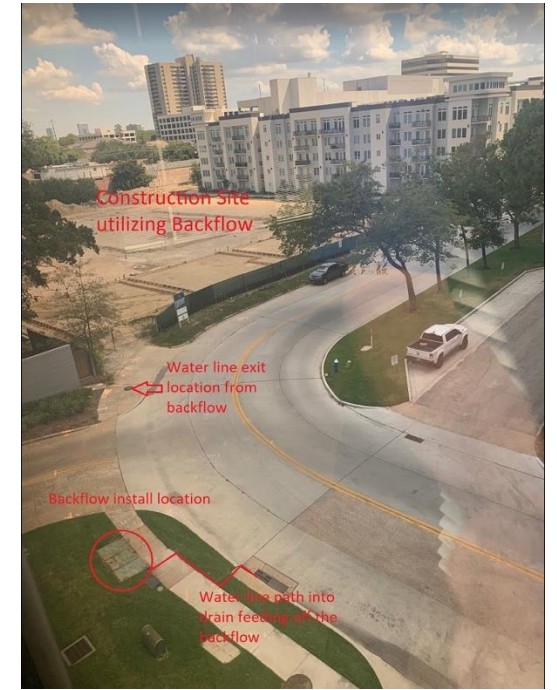
Inspection Types

Untreated Water Supply

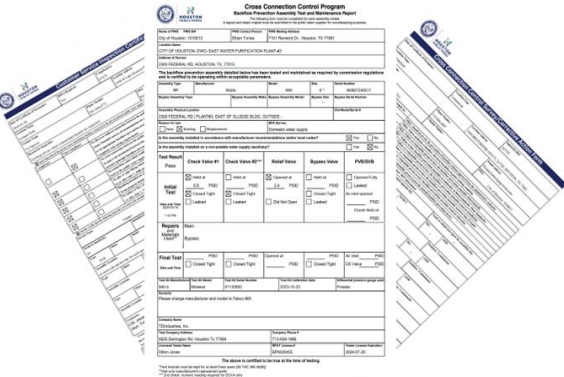
- Review drawings
- Request containment protection

Unauthorized System Connections

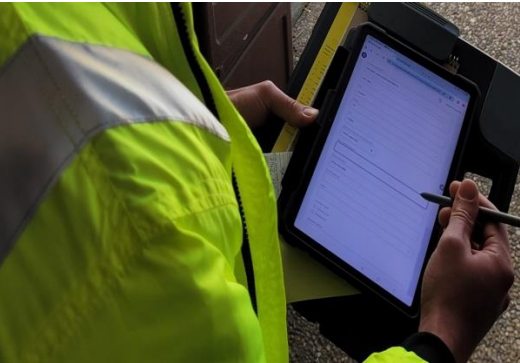
- Fire hydrants
- Illegal taps



CLOUD BASED DATA MANAGEMENT



Digital Reporting



Field Accessibility

Test Reports

| Status | Result | Discrepancies | Reported On | Submitted On | Type | Serial Number |
|----------|--------|---------------|-------------|--------------|------|---------------|
| Accepted | Pass | 0 | 2024-04-02 | 2024-04-02 | PVB | HK53038 |
| Accepted | Fail | 0 | 2024-04-02 | 2024-04-02 | DCDA | N47761 |
| Accepted | Fail | 0 | 2024-04-02 | 2024-04-02 | PVB | A66413 |
| Accepted | Pass | 0 | 2024-04-02 | 2024-04-02 | DCDA | 4137254 |
| Accepted | Pass | 0 | 2024-04-02 | 2024-04-02 | RP | 4162330 |
| Accepted | Pass | 0 | 2024-04-02 | 2024-04-02 | DCDA | N47761 |
| Accepted | Pass | 0 | 2024-04-01 | 2024-04-01 | PVB | HK89051 |
| Accepted | Pass | 0 | 2024-04-01 | 2024-04-01 | PVB | HK42111 |

Real-Time Submissions



Customizable Dashboards

OTHER RESOURCES

Government Applications

- Infor
- TransUnion TLO
- HCAD

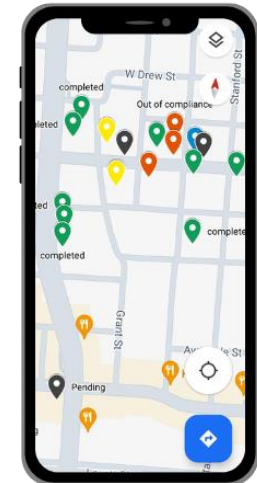
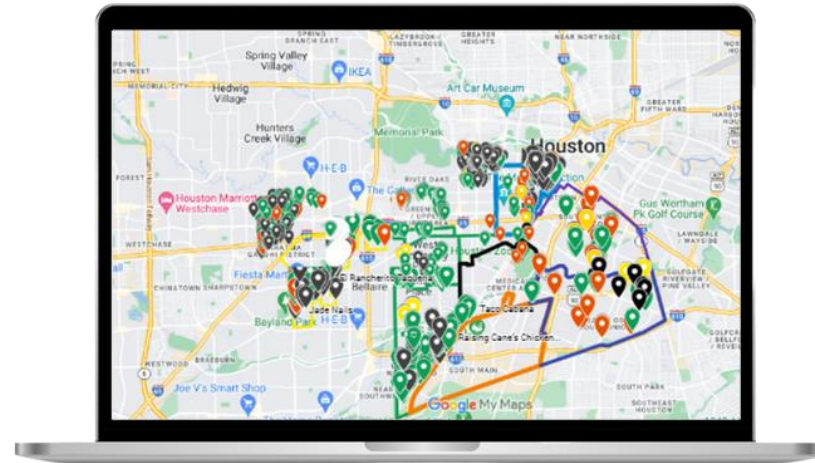


Microsoft Suite

- OneDrive
- Excel
- Planner

Google

- Google Photos
- MyMaps



HOUSTON WATER DEMAND INCREASE

Infrastructure Stress



Medical Center Expansion



Population Growth



Drought
Water Leaks

Hosting Events



MUTUAL BENEFITS



Training



Team Building



Career Growth



4/10 Work Schedule



Satellite Parking

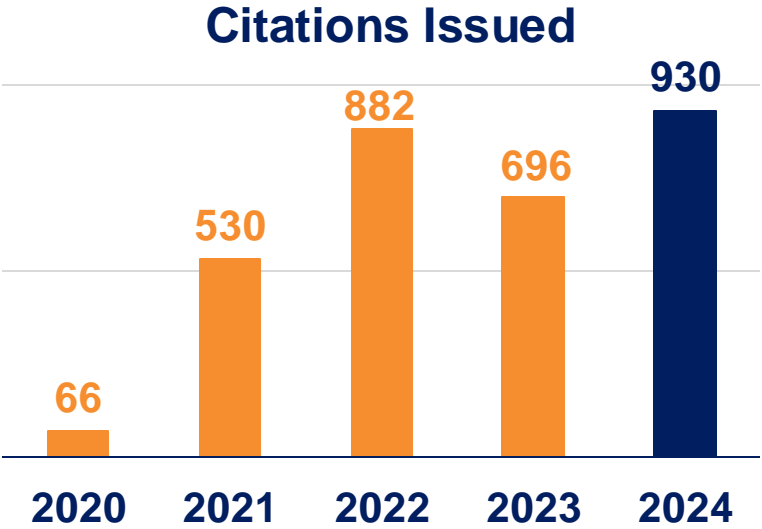
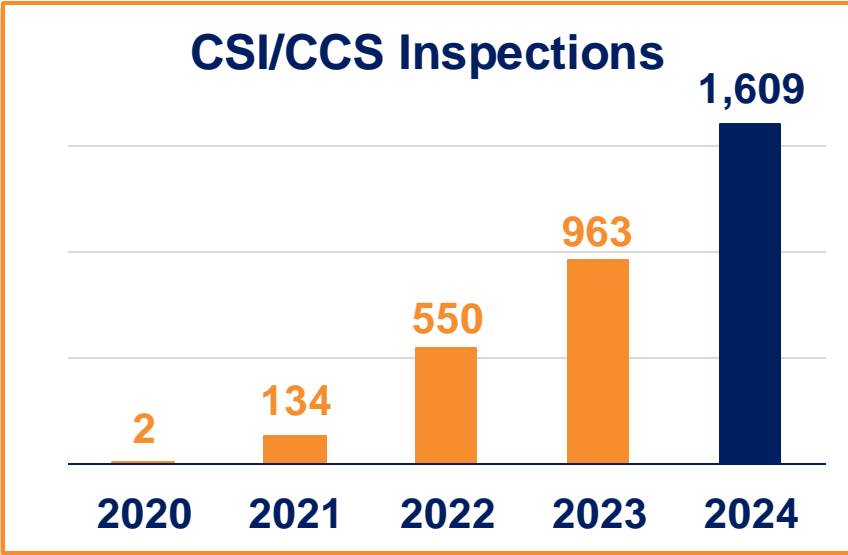
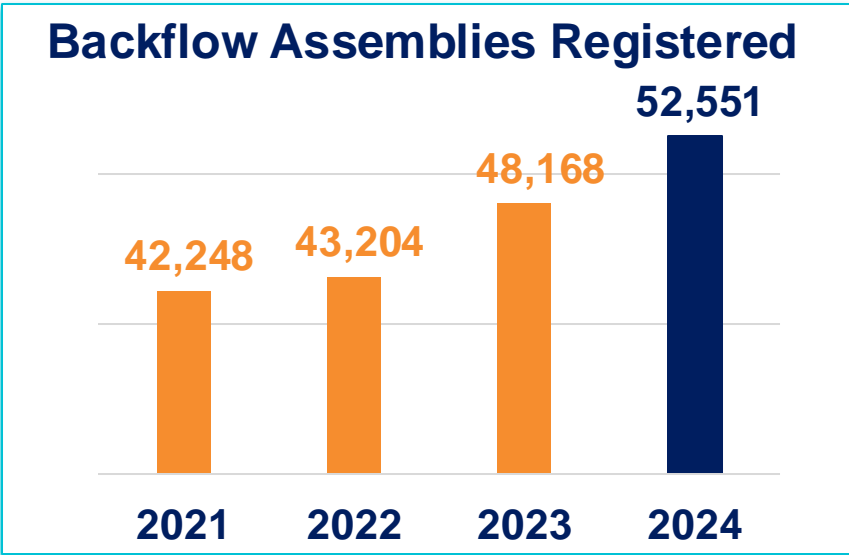


Bilingual Pay

PERFORMANCE



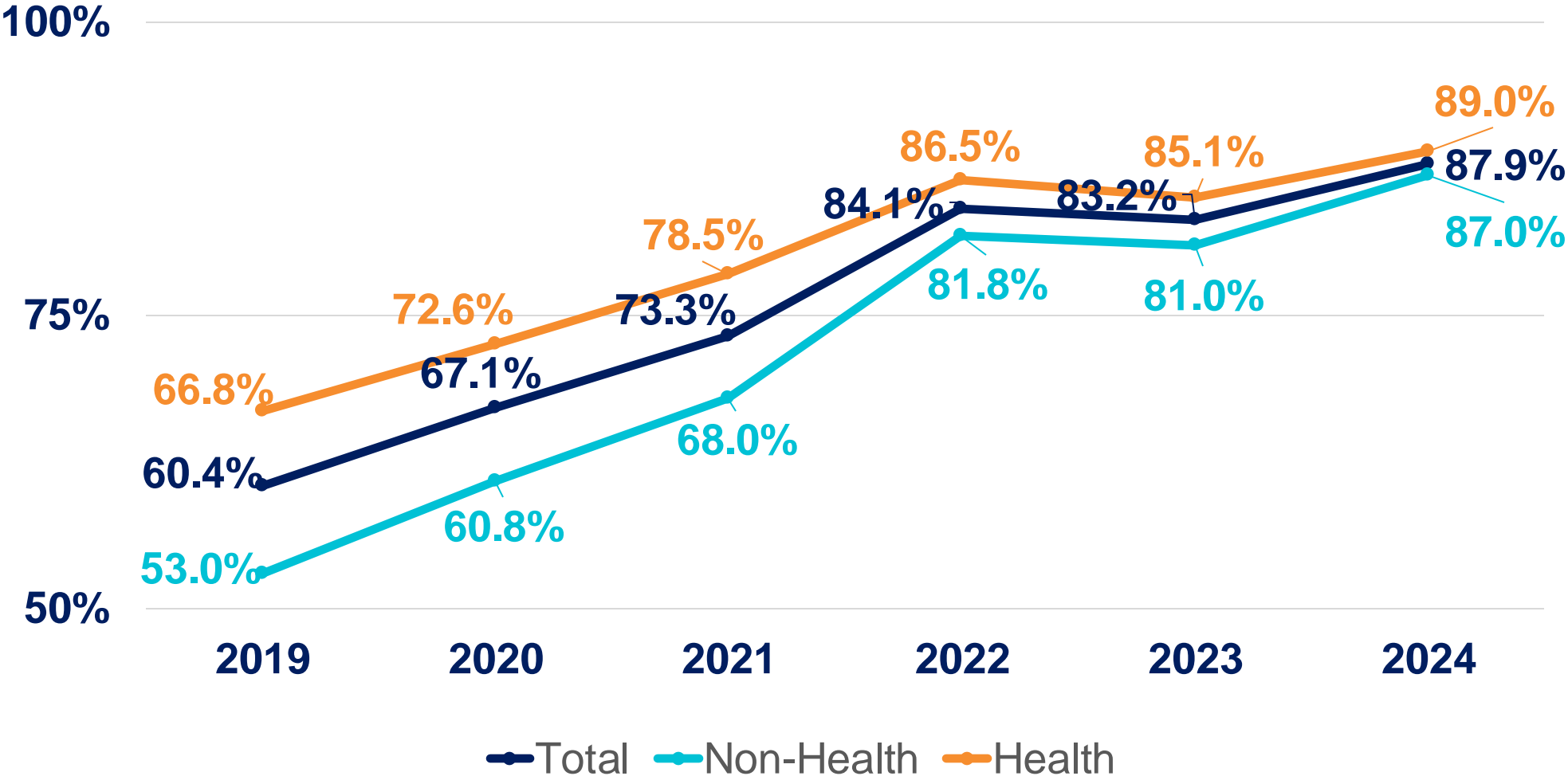
PERFORMANCE INDICATORS



| | Due | Paid | Dismissed |
|-----------|-----------|-----------|-----------|
| Total 24' | \$720,196 | \$180,692 | \$27,112 |
| Total 23' | \$449,835 | \$101,336 | \$17,934 |

PERFORMANCE INDICATORS

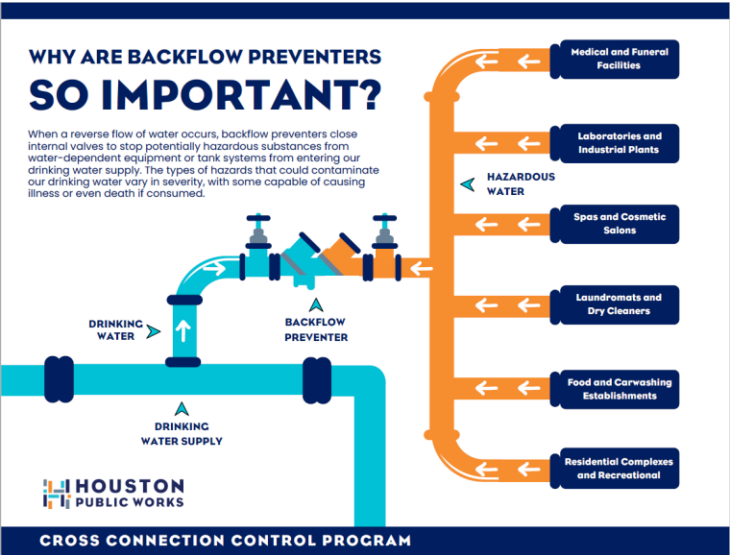
Registered Backflow Assembly Compliance Rate



VISION



PUBLIC OUTREACH



PROGRAM'S GROWTH



Increase of Staff



Inspection Sweeps

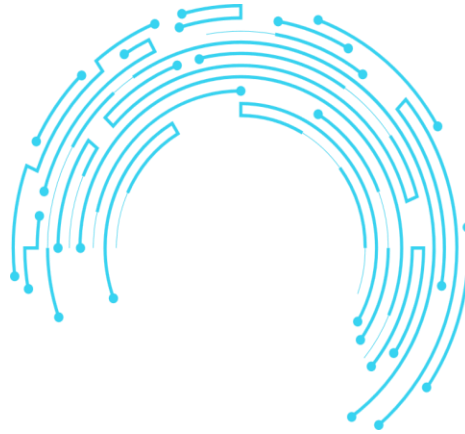


Program Ordinance

AS WE CONTINUE TO EVOLVE



Collaboration



Technology



Diversity

**Staff
Development**



thank you!

Efrain Torres

Division Manager

Cross Connection Control Program

O: 832.395.3826 | E: efrain.torres@houstontx.gov



HoustonPublicWorks.org



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