



Advancing Gas Safety Through Early Leak Detection and Response

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GTI Energy Overview

Serving the Energy Industry Since 1941

- Independent, not-for-profit research, technology development and training organization
- Areas of research include energy production and conversion, energy delivery, and end-use
- Technology development focus on safety, improving efficiency, and reducing emissions
- Research Facilities
 - 18-acre campus near Chicago
 - Laboratories in Agoura Hills, CA and Davis, CA
 - Pilot and demo facilities worldwide



Our Capabilities

GTI is addressing global energy and environmental challenges across the energy value chain



Supply

Expanding the supply of natural gas and renewable energy



Conversion

Transforming natural resources into clean fuels, power, and chemicals



Delivery

Ensuring a safe and reliable energy delivery infrastructure



End Use

Promoting the clean and efficient use of energy resources

Operations Technology Development (OTD)



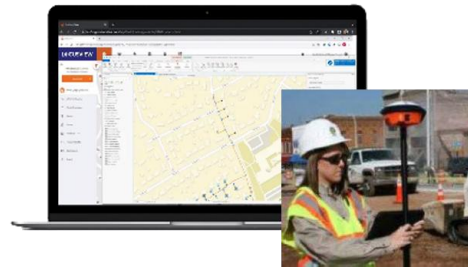
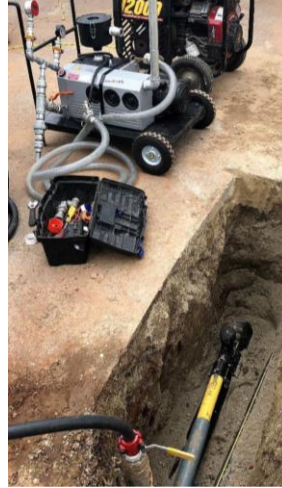
Stand-alone, not-for-profit, member-controlled company where gas utilities work together to develop technology solutions to common issues

Mission

- Identify, select, fund, and oversee research projects resulting in innovative solutions and the improved safety, reliability, and operational efficiency of natural gas systems

Goals

- Enhance safety
- Enable operational excellence
- Minimize environmental impact
- Provide good science



Working collaboratively to address critical energy challenges impacting gases, liquids, efficiency and infrastructure



OTD Members

Serving more than 70 million gas consumers in the U.S., Canada & France



- PECO Gas (Exelon)
- Philadelphia Gas Works (APGA-RF)
- National Fuel Gas
- Columbia Gas of PA (NiSource)
- UGI Utilities

Initiatives Leading to Smart Sensor Development

Unfortunately, natural gas incidents occur due to various reasons.

Two incidents have led to renewed interest and demand to develop and investigate natural gas detectors for dwellings.



2014 – East Harlem, NY apartment building



2016 – Silver Spring, MD apartment building

As result of the Silver Spring, MD investigation, the NTSB issued a total of 13 safety recommendations

GTI Energy received one recommendation from the NTSB - to develop standards for methane detection systems for all types of residential occupancies in both the IFGC and the National Fuel Gas Code, NFPA 54.

Enhancing Safety Through Adoption of Natural Gas Detectors

- NGDs are commercially available however, there is low customer adoption
- Extensive laboratory testing of commercially available NGDs
- National pilot study was conducted to collect performance data in various residential settings



Recent NTSB findings have recommended the use of natural gas detectors

Improve Accuracy and Reliability

- Work collaboratively with manufacturers to ensure commercial products deliver safety enhancement expectations for the gas industry

Adoption of Codes and Standards

- NFPA code for NGD use and installation
- Modify existing UL 1484 standard with emphasis on lower detection limit (from 25% LEL to 10% LEL)

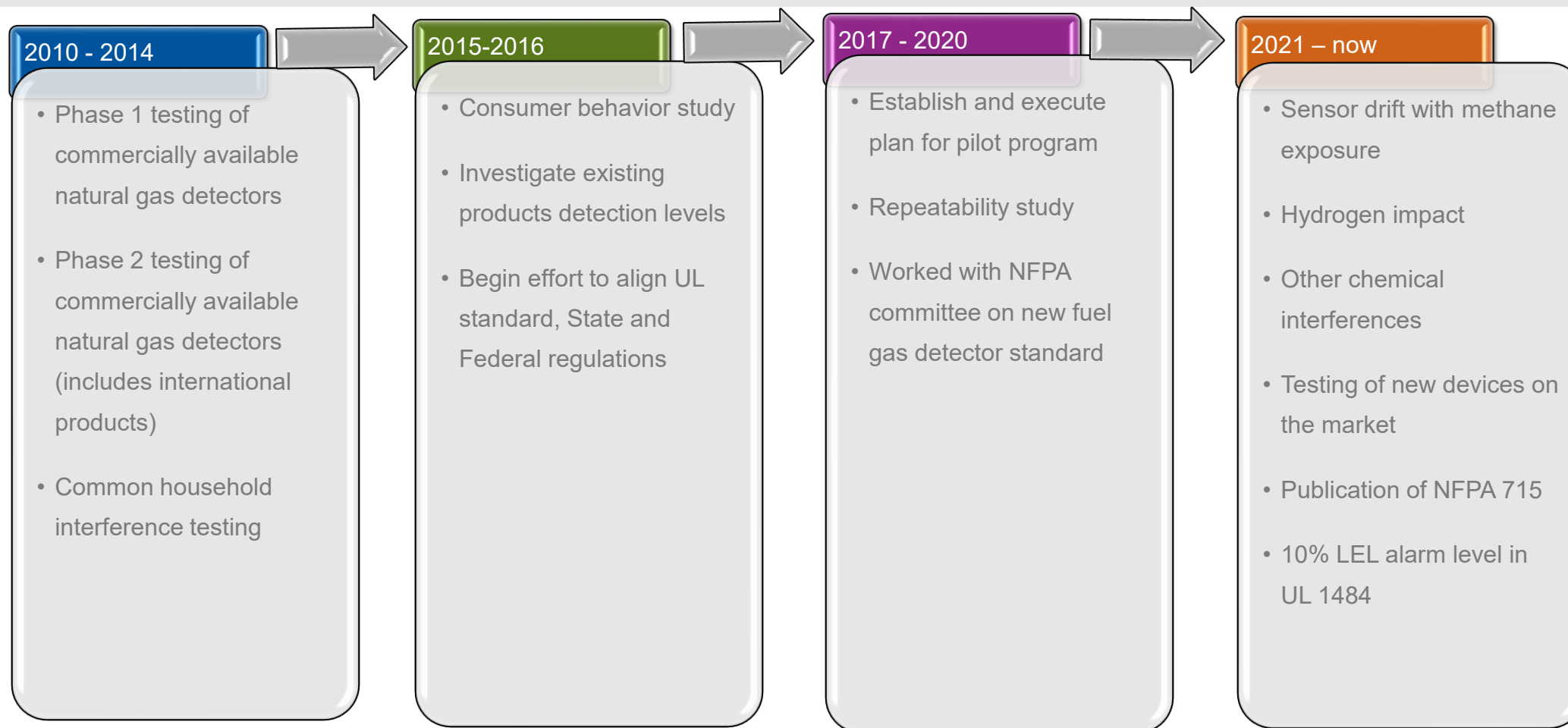
Enhanced Awareness and Education

- Continue stakeholder education and outreach and develop formal advocacy plans

Product Advancement

- Determine optimal placement of detectors based on U.S. building construction practices and typical ventilation effects

Natural Gas Detector Testing Program and Timeline



Natural Gas Detectors offer an opportunity to augment existing safety programs and add another layer of protection for leak detection.

Comprehensive Industry Adoption Approach



- Evaluation of device response to varying levels of methane.
- Effects of common household chemicals on “false positive” detection and alarms including contaminants such as, hairspray, bleach and disinfectant spray.
- Impacts on performance from common household environmental changes such as temperature and humidity.
- Evaluation of proper placement to ensure detection if a release occurs - **NFPA 715 Developed !!**
- Evaluation of existing UL Standards and recommendations for improvements including lowering the detection threshold from 25%LEL to 10% LEL - **UL 1484 Updated !!**
- Consumer behavior studies and public awareness improvements.

NGA, Con Ed, GTI Energy, NFPA Fire Research Foundation, GEXCON & Fire & Risk Alliance LLC – ***Putting “science” around placement and detection thresholds***

Consumer Behavior Study

Objective

- Evaluate consumer behavior and understanding around natural gas detector adoption and use.

Methods – 3 Parts

- National Awareness Attitude and Behavior Survey (1035 surveys conducted)
- One-on-One Qualitative Interviews
- Evaluation of NGD Messaging

High-level Survey Results:

- Revealed that overall awareness and ownership of NGDs is **very low**.
- On an open-ended question, **no single respondent** mentioned natural gas detectors as a safety device for the home
- Once prompted, 47% stated they were “familiar with NGDs” - only 9% claimed to own an NGD
- Later in-person interviews indicated confusion between RMDs and CO detectors.

Low customer adoption

Natural Gas Detectors - Testing

Phase 1 Testing (2010)

- Tested 5 brands in triplicate
- Tested for methane at 25% LEL and 16 interfering household chemicals
- False positive responses were a concern
- Three of the products were included in the next round of Phase 2 testing

Test Chemicals	
Methane	Duster spray
Propane	Home dry-cleaning kit
Paint thinner	Oven cleaner
Ethanol	Cyanoacrylate adhesive
Acetone	Laundry soap
Aerosol hairspray	Disinfectant spray
Febreze	Bathroom cleaner
Ammonia	Carbona stain remover #2
Furniture polish	Iron Out
Bleach	Hydrogen sulfide, 1 ppmv

Phase 2 Testing (2014) - Performance

- 13 brands (U.S. and international) were tested
- Tested at methane levels ranging from 6% to 25% LEL
- 19 common household chemicals at typical use levels



Phase 2 Results:

- 11 of the 13 brands alarmed at 25% LEL
- 2 brands did not alarm
 - Low cost no-name brand units
- 7 of the 13 responded to interfering chemicals
- Most common interferents
 - Ethanol
 - Acetone

Natural Gas Detectors – Testing - Phase 3 (2018)

- All 9 brands alarmed at 25% LEL
 - 6 responded to 10% LEL
 - 3 responded at 5% LEL
- 1 of the 9 responded to interfering chemicals
- Again, the most common interferents
 - Ethanol
 - Acetone

ID	Methane			Propane	# of Interfering Chemicals
	25% LEL	10% LEL	5% LEL	25% LEL	
A	Y	N	N	Y	0
B	Y	N	N	Y	0
C	Y	Y	Y	Y	0
D	Y	Y	Y	N	0
E	Y	Y	N	N	0
F	Y	Y	N	N	0
G	Y	Y	N	N	0
H	Y	Y	Y	Y	4
I	Y	N	N	N	0

Pilot Study - Test Plan for Phase 3

- Technical validation and statistical summary of NGD performance is a necessity
- Evaluate the performance of detectors in a variety of *actual* residential settings
- Three manufacturers selected based on previous lab testing/performance and market share
- GTI provided all detectors and components for installation, utilities installed in residential customer homes
- Pilot study duration approximately 12 months, 12 utilities participated plus GTI employees
- Utilities removed detectors from homes once pilot was complete and returned them to GTI for post testing

Manufacturer	Model A	Model B	Model C
Residence	Single Family		Multi-family
Location	Sleeping Area		Living Area

Participant Comments

While not everyone filled out the end of project questionnaires – based on the results received.

Four categories of comments:

- Overall, the participants liked the NGD – said **they felt safer**
- Issues with the **dangling cord** and high wall installation (greatest # of comments)
- Issues with the battery, including **too many changes** and loud noise with a low-battery signal
- Flimsy construction (all of these were related to one specific model)

Cords hanging on the wall pose not just a cosmetic issue but also a safety risk, especially in households with small children.

Most important reason to own:
“Sense of security”



GTI Energy – Current Natural Gas Detector Pilot Program

Intended Key Takeaways:

Several OTD members are investigating and working toward deploying indoor natural gas detectors on customers' premises.

This project explored field deployment of newer LTD-M technology for indoor natural gas detectors.

- Plug & Play (ready to go & no AMI is needed)
- 16 participating utilities, 5+ NGDs of each model based on budget
- (2) Separate trainings for installation, maintenance, and user interface.
 - DeNova Detect
 - eLichens (Avolta)



Utilities Deploying NGDs (Connected NGDs)



As a result of NTSB recommendations and PHMSA support for NGDs, several utility operators have initiated NGD deployment programs or pilots.

- **Con Edison:** Connected NGD deployment and past program to hand out consumer-grade NGDs. Over 275,000 units deployed to date.
- **Orange & Rockland Utilities:** Recently started to deploy connected NGDs
- **Nicor Gas:** Initiate a pilot deploying connected NGDs. This pilot is focused on customers with inside meter sets. Funded through rate case filing.
- **SoCalGas:** Historical pilot programs deploying connected NGDs – program terminated
- **National Grid (NY):** Recently initiated a program to deploy connected NGD's. Initial focus is on downstate NY, with plans to install 30,000 units this year.
- **Baltimore Gas & Electric:** Recently initiated a program deploying connected NGDs.
- **GTI Pilot Program (OTD funded):** working with numerous OTD member utilities, deploying a small quantity of connected NGDs.
- **Others...**

Utilities Deploying NGDs (Consumer Grade NGDs)

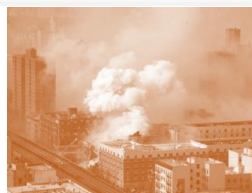


Some of the utilities that have promotional campaigns and/or deploying NGDs (consumer grade)

- **Con Edison:** Consumer grade NGD deployment program. Initially, pilot program (as part of OTD project) and then a targeted campaign to handout consumer grade NGDs (~10,000 units)
- **National Grid:** Had a program handing out consumer grade NGDs. 10's of thousands deployed.
- **Pacific Gas & Electric:** Consumer campaign deploying consumer grade NGDs (<500 units)
- **NiSource/Columbia Gas (PA):** Consumer campaign/Low Income deployment (<300 units)
- **Avangrid/RG&E:** Consumer campaign/Low Income deployment (>40,000 units in Rochester area)
- **Alta Gas/Semco Energy:** Consumer campaign/Low Income state-funded program conducting home assessments and installations of NGDs (>1000 units in Grand Rapids, MI area)
- **Central Hudson Gas & Electric:** Consumer campaign/Low Income deployment and (<500 units)
- **Others...**

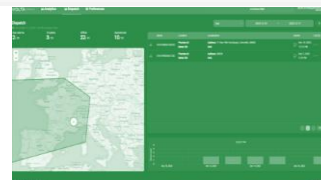
What Are Others Doing?

CON EDISON



- 2014 East Harlem
- **250k+ units**
- **6-4 alarms per day**
- Focus on inside meters and POE installations
- **Back haul via AMI (electric)**
- Autogenerated work orders in response
- Go with Fire every time

NICOR



- **Customer pilot launched in 2025 (connected devices)**
- **300 units Goal with 180 devices (cellular) 11 alarms**
- Focusing on inside meter installations (~25k)
- Project team runs pilot but currently trying to transition to dispatch
- Plan to install units on Leak survey
- Hoping to eliminate their leakage survey with these installs
- Seeking regulatory recovery

AVISTA



- **10 Devices (cellular) (GTI Pilot)**
- Working closely with one of the manufacturers
- Plans to install units on Leak survey
- Hoping to eliminate/reduce their leakage survey by these installs
- Hoping to get regulatory recovery
- Currently challenged on stakeholder buy-in
- Focused on inside meters

NGRID Consumer Grade Natural Gas Detector Program



What is the purpose of this program?

- Recent natural gas incidents have shown that some people do not report gas leaks even when they smell the distinctive, sulfur-like odor characteristic of odorized natural gas.
- National Grid is distributing the NGDs and companion brochures to address this issue and enhance public safety.

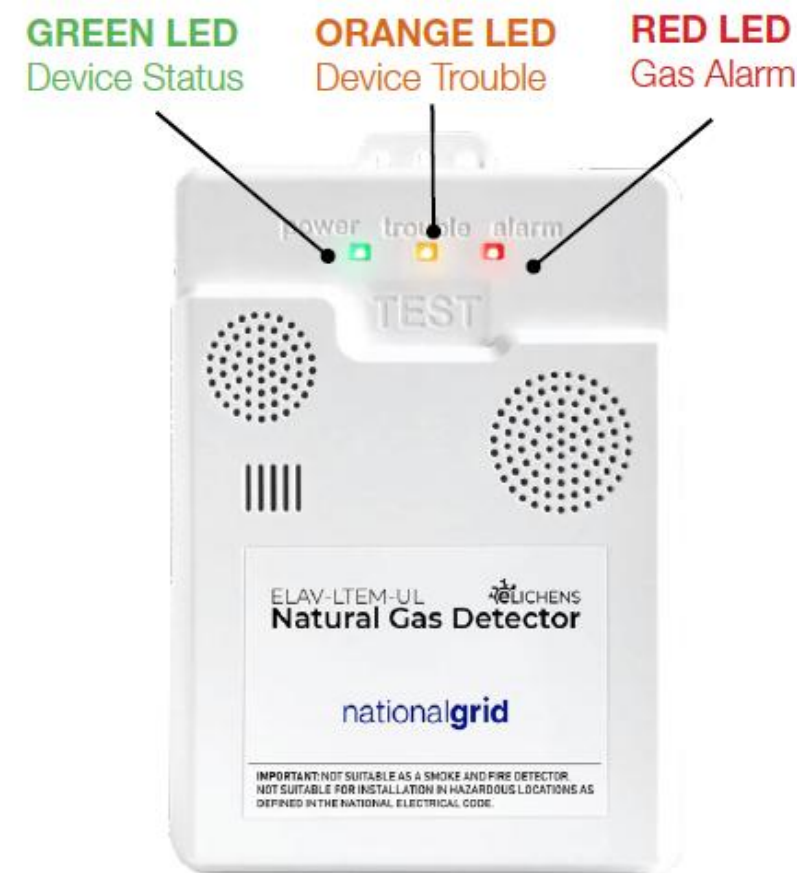


NGRID Connected NGD Program

nationalgrid

Your new Connected Natural Gas Detector helps protect you with early warning for potential natural gas leaks

- We are committed to providing safe, reliable natural gas service to you and your community. As part of a new program implemented by New York state, a Connected Natural Gas Detector has been installed in your building to provide early warning of any natural gas leak.





Thank you!

GTI Energy develops innovative solutions that transform lives, economies, and the environment

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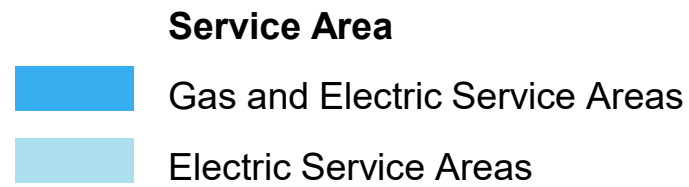
Con Edison AMI Enabled Natural Gas Detector Program

Rick Trieste
Department Manager
Research, Development & Demonstration



Consolidated Edison Company of NY

- Serve 3.6 million electric and 1.2 million gas customers
- Gas System:
 - 4,600 miles distribution main & service pipe
 - 380,000 gas services



Catalyst Event

- East Harlem explosion 3/12/14



Catalyst Event

Numerous residents noticed a gas odor and failed to report it.



10 consumers smelling gas and **did not** react



1 consumer smelling gas the day before called Con Ed ~25 min prior to incident



2nd Catalyst Event

- East Village explosion 3/26/15



...and that began.....



Program Overview

- 294,793 units as of 6/30/26

2016 – 2017 Industry research GTI Testing

- Technology/Vendor selection
- GTI testing
- Code review

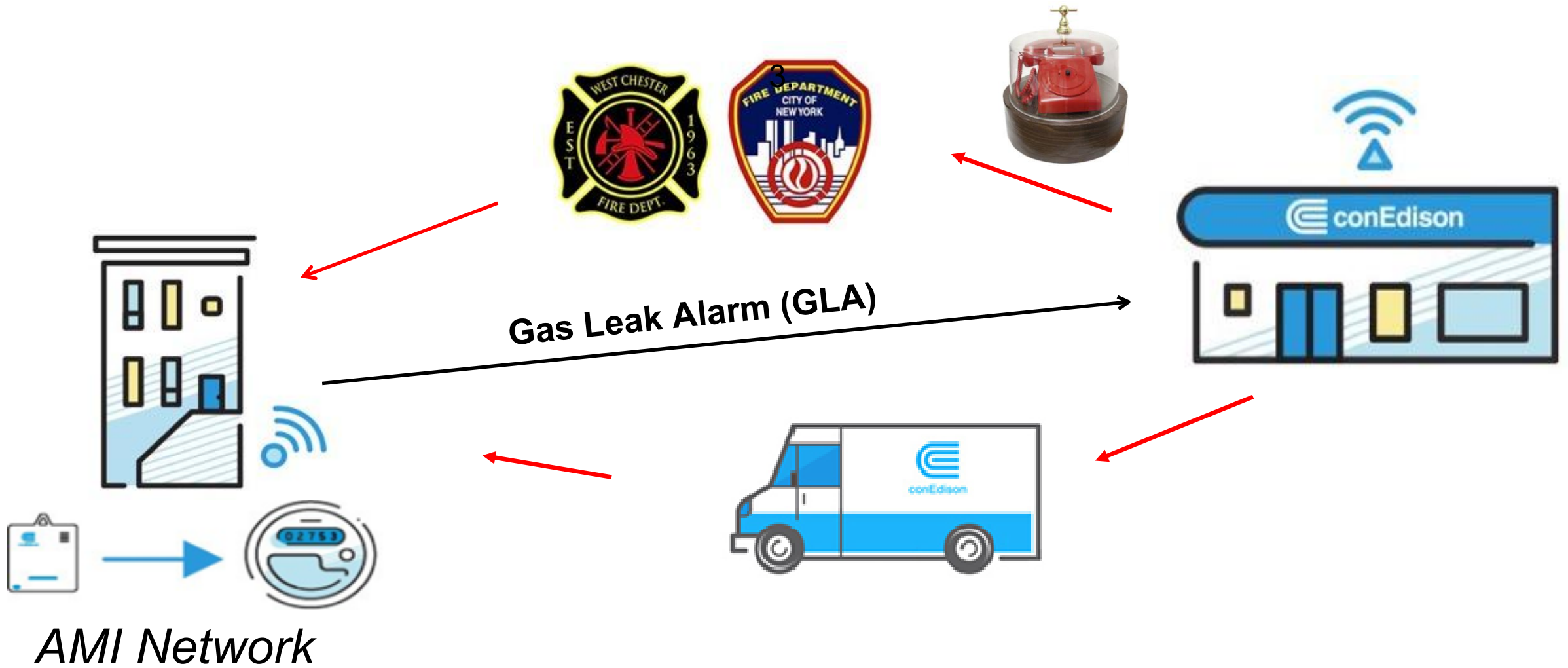
2018-2019 Pilot Program 9,000 units installed

- Plan and coordinate program
- Install at building point of gas service entry
- Ensure all systems work
- Review procedures
- Monitor, gain feedback, continuously improve
- 5-year battery life

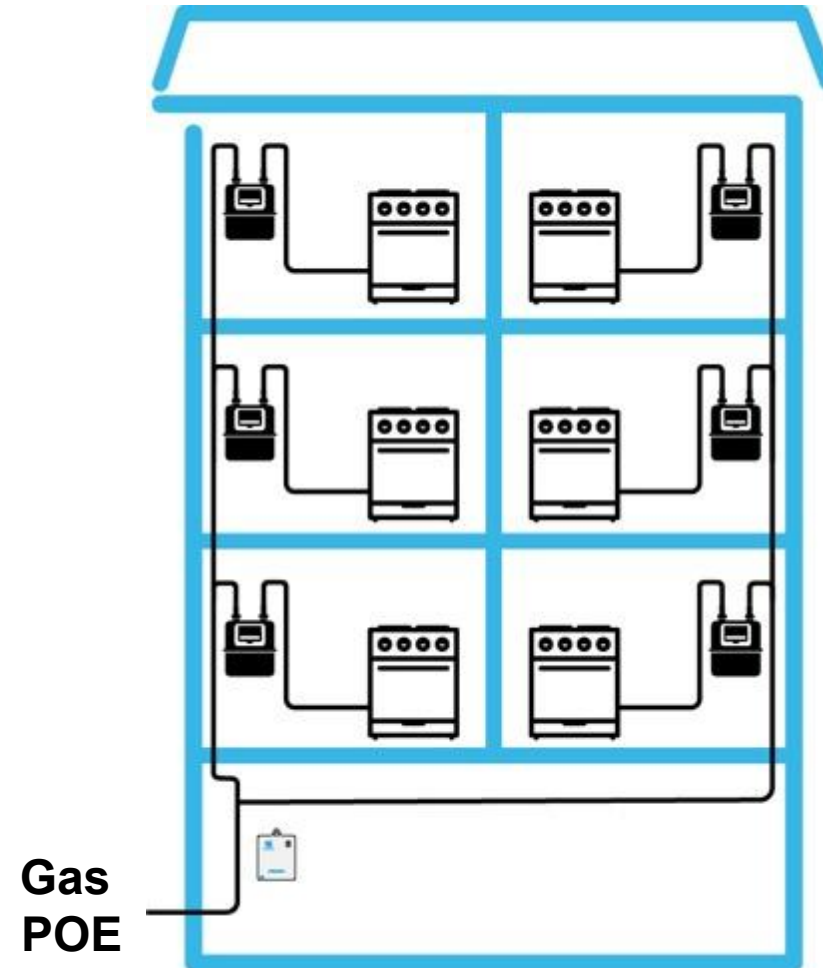
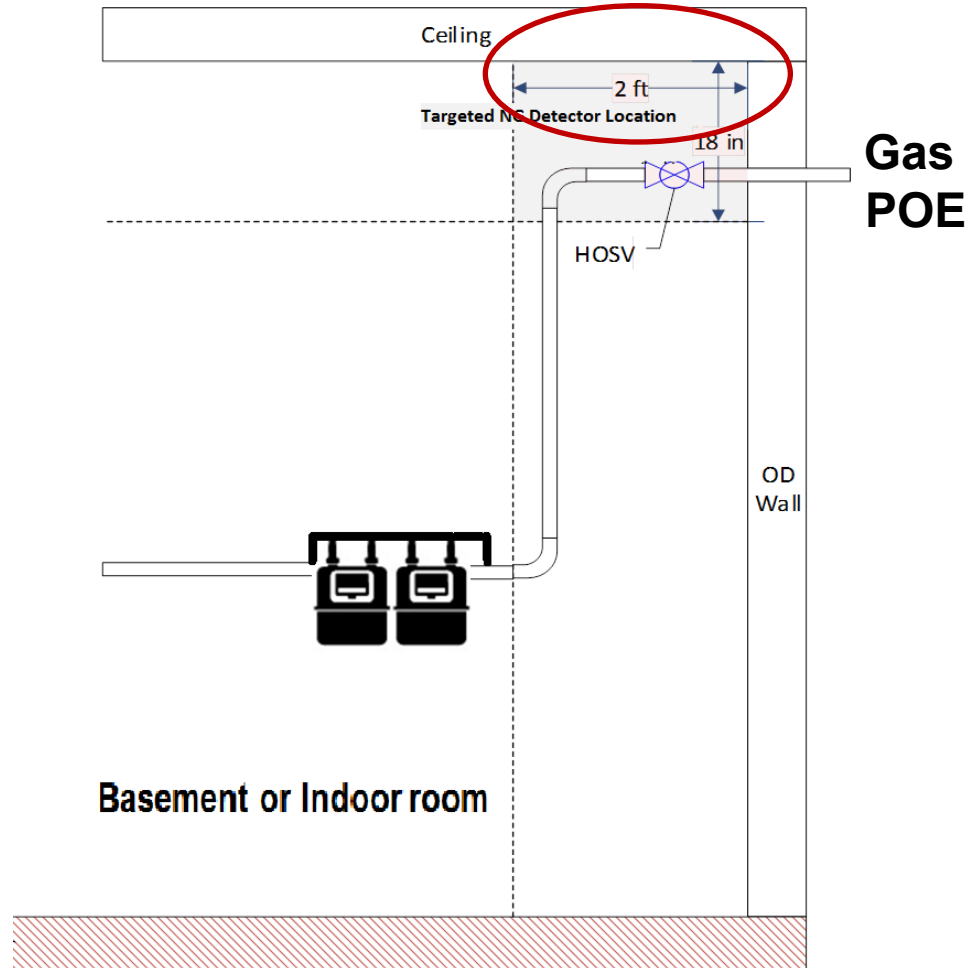
2020 – 2025+ Implementation

- Procure and train workforce
- Educate stakeholders, emergency responders, and customers
- Install NGDs pursuant to AMI rollout
- Install NGDs bundled with service line inspections
- Improved battery life to 10-years

Response & Coordination



Installation



Installation Examples



Warning Tag

 **WARNING**

This device detects the presence of NATURAL GAS, which can IGNITE or EXPLODE, CAUSING SERIOUS INJURY or DEATH. NEVER IGNORE ANY ALARM.
DO NOT TAMPER WITH THIS DEVICE OR ITS BATTERY OR MOVE OR RELOCATE THE GAS DETECTOR FROM WHERE IT IS INSTALLED.
Doing so could disable this device, cause it to malfunction, and/or result in serious injury or death.
A yellow blinking light indicates that the Gas Detector may not be functioning properly or that its battery may be running low. CONTACT CON EDISON IMMEDIATELY AT THE PHONE NUMBER BELOW IF YOU OBSERVE A YELLOW BLINKING LIGHT.

Read and follow the other Important Safety Information & Warnings for this Gas Detector available at:
conEd.com/NaturalGasDetector or by scanning this QR code:



EVACUATION PROCEDURE

If at any time you SMELL NATURAL GAS or THE ALARM ON THIS DEVICE SOUNDS:

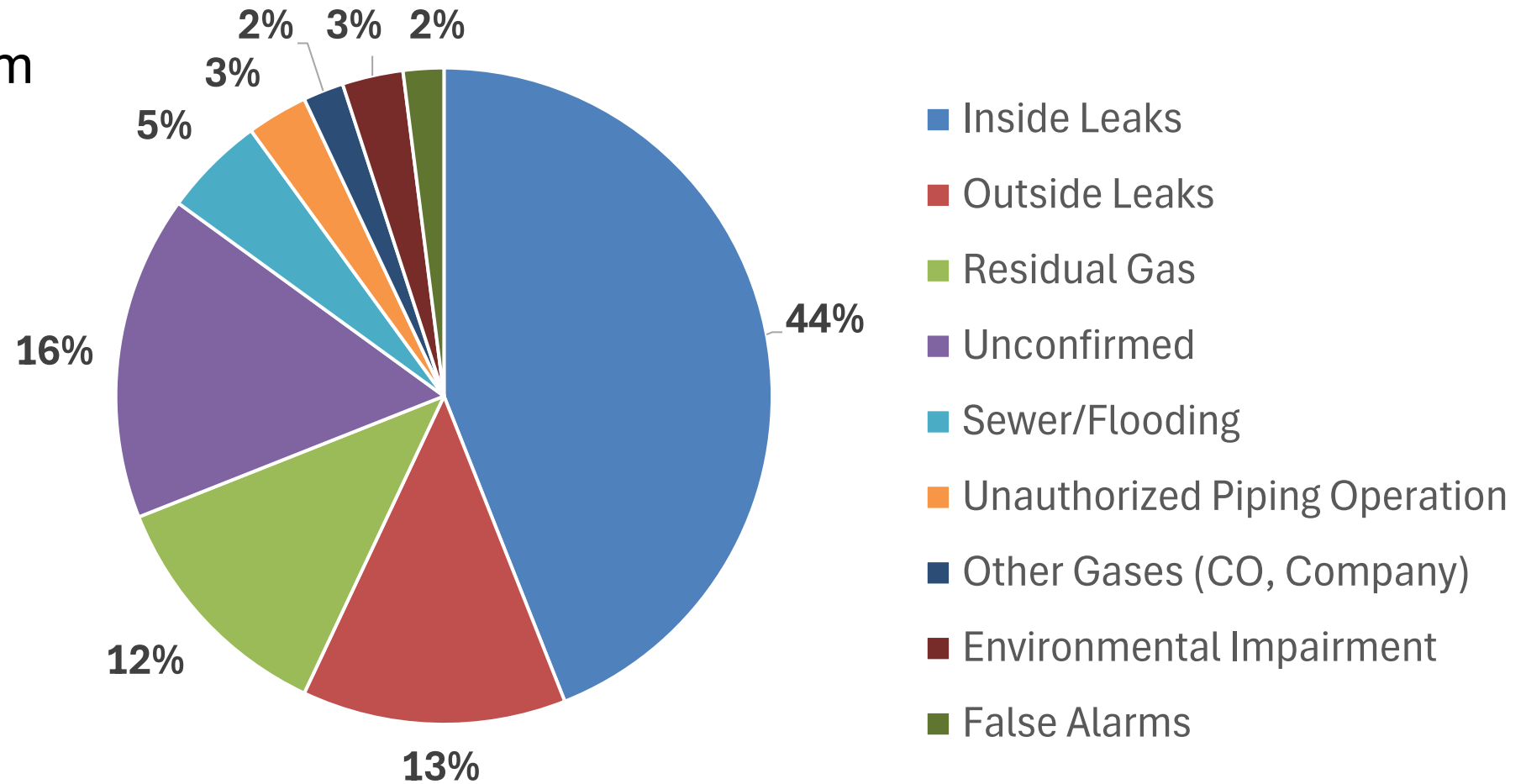
1. EVACUATE IMMEDIATELY and take others with you.
2. Do NOT use a phone, light a match, or turn on or off any light switches, flashlights, or appliances. Doing so could IGNITE a FIRE or EXPLOSION.
3. CALL 911 once you are safely outside the premises.
4. Do NOT reenter until told to do so by authorities.

 **conEdison**

Natural Gas Detector
For information or questions, call
1-800-75-CONED (1-800-752-6633).
Mira el otro lado para español.
中文請見其他標籤
다른 한국어 태그 참조
См. другую метку с русским текстом
বাংলার জন্য অন্য ট্যাগ দেখুন

Gas Leak Alarm (GLA) Summary (6/30/26)

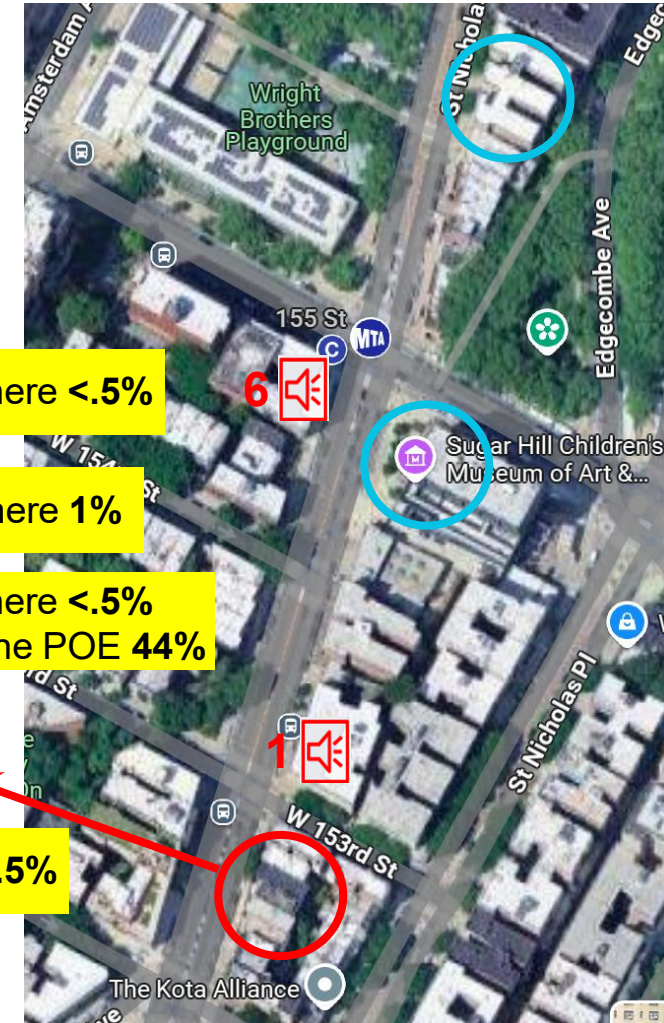
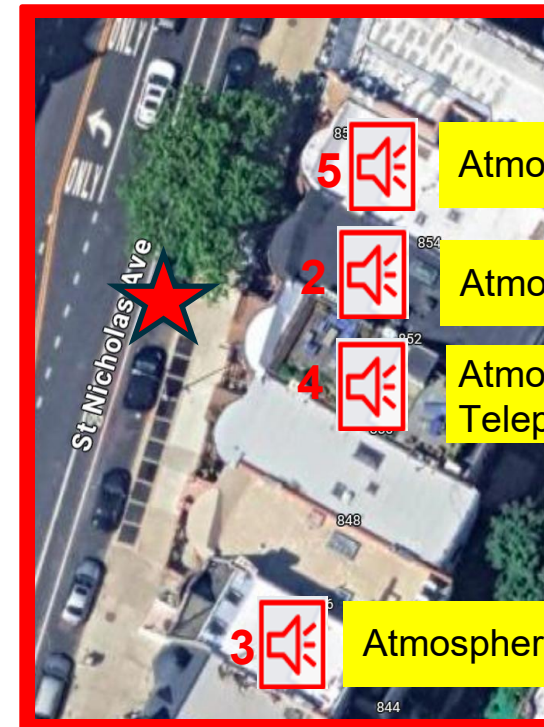
- 7,783 actuations from program



Main Leak Detection

- January 2025, Manhattan
- ★ leak location – Low Pressure CI
- 6 GLAs
 - 1st 2055 hrs.
 - 2nd +4 mins
 - 3rd – 6th +13 to 43 mins
- 0017: atmospheric readings
- 0129: atmospheric readings
- 0251: identified leak
- 0359: repair complete

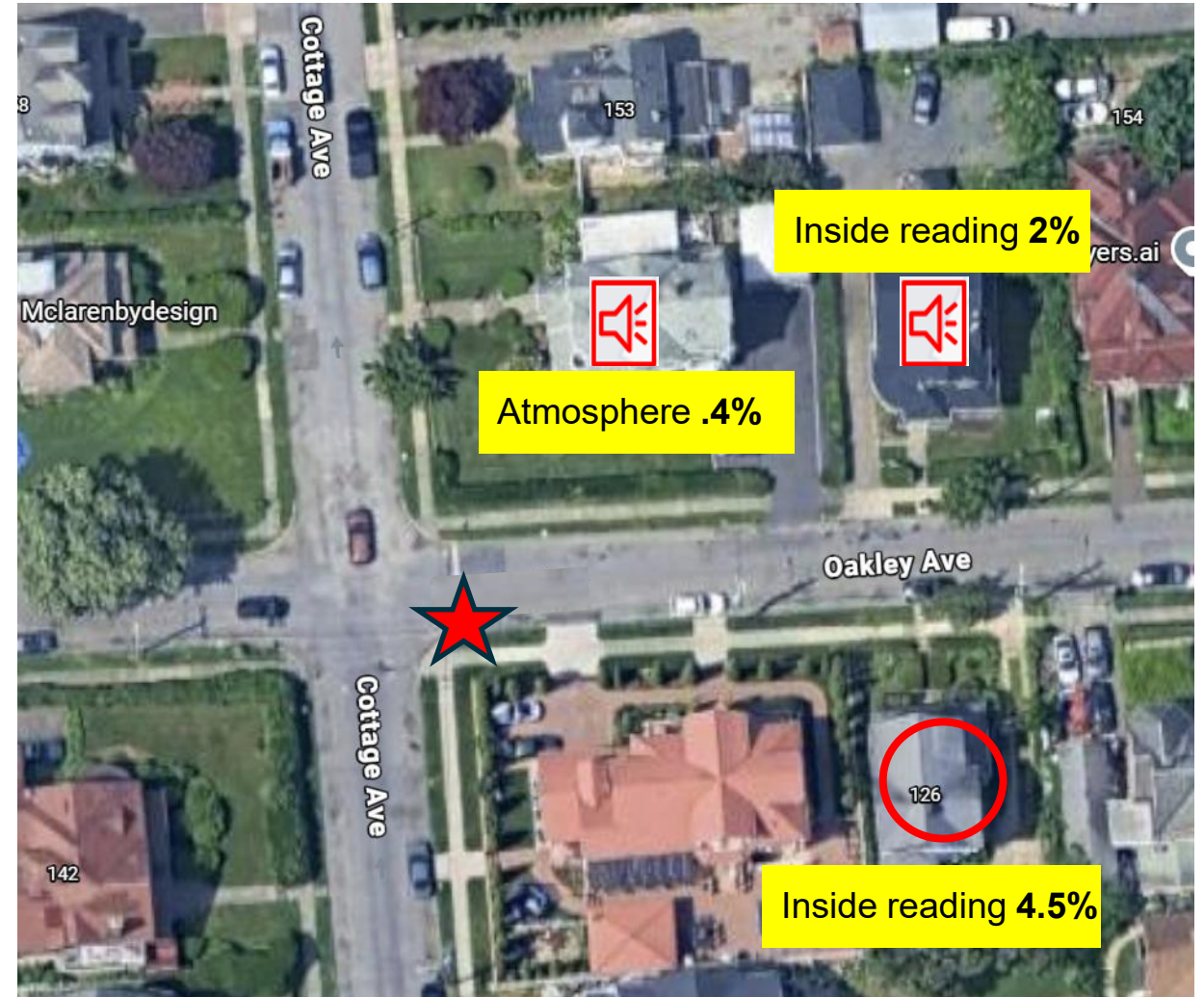
 = GLA



Main Leak Detection

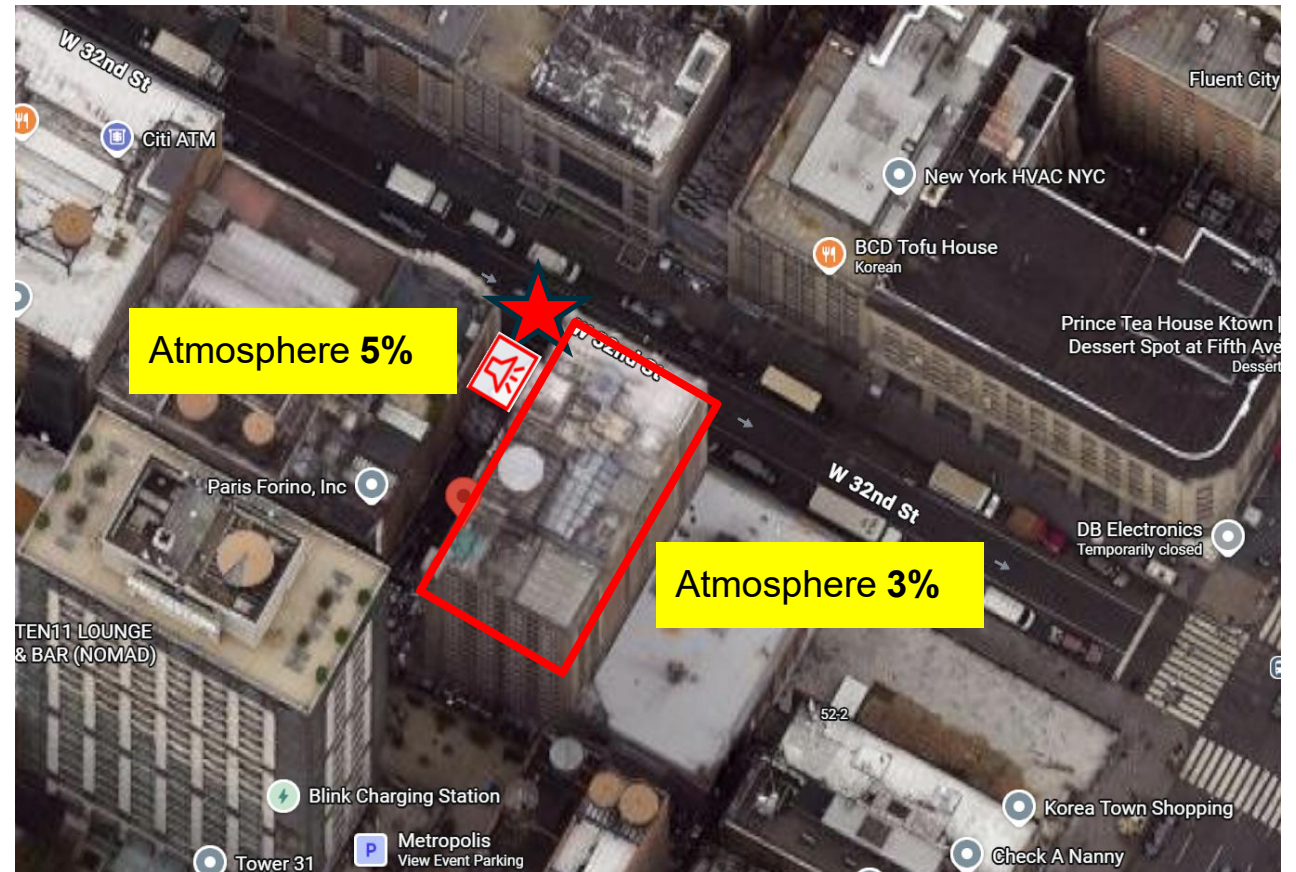
- February 2022 , Westchester County
- ★ leak location – Low Pressure CI
- 1st 0100 hrs.
- 2nd 0149 hrs.

 = GLA



Service Leak from Electric Burnout

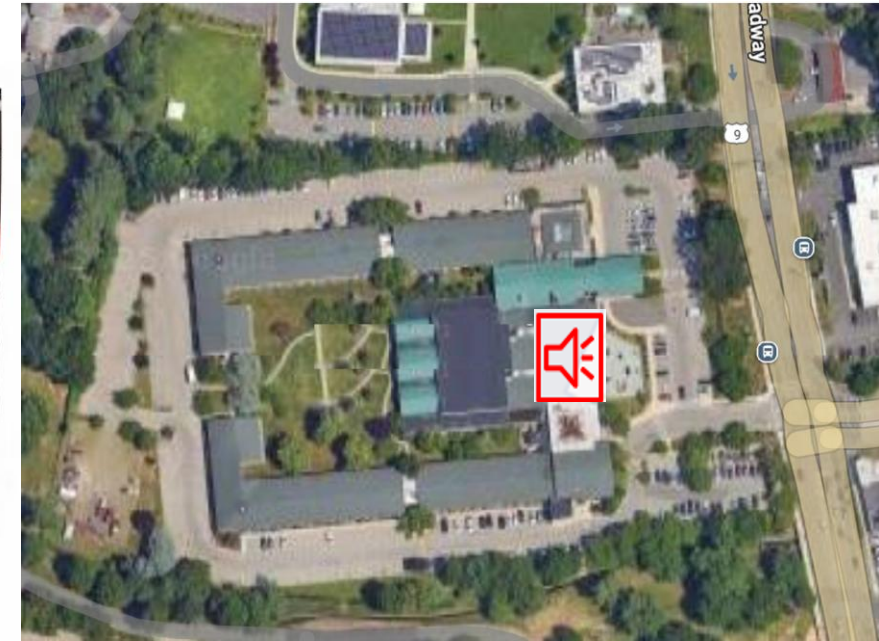
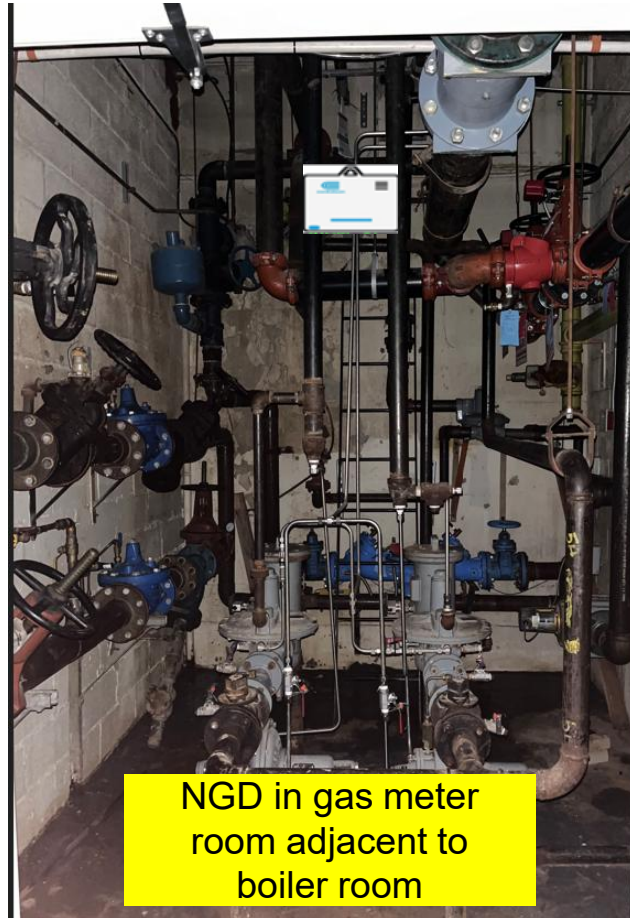
- September 2022, Manhattan
- ★ Leak location - PE service leak
- Investigation found atmospheric readings in adjoining buildings



 = GLA

Building Leak Detection

- July 2024, Westchester County
- 6% *gas-in-air* basement
- Boiler explosion broke fuel gas pipe
- 75 occupants evacuated



 = GLA

Building Leak Detection

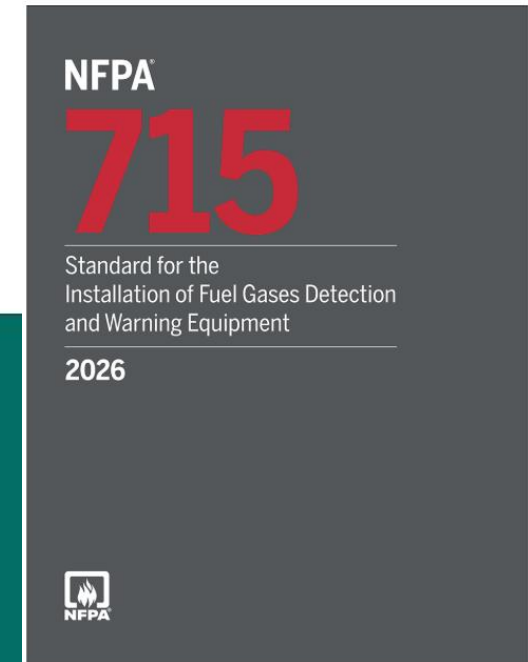
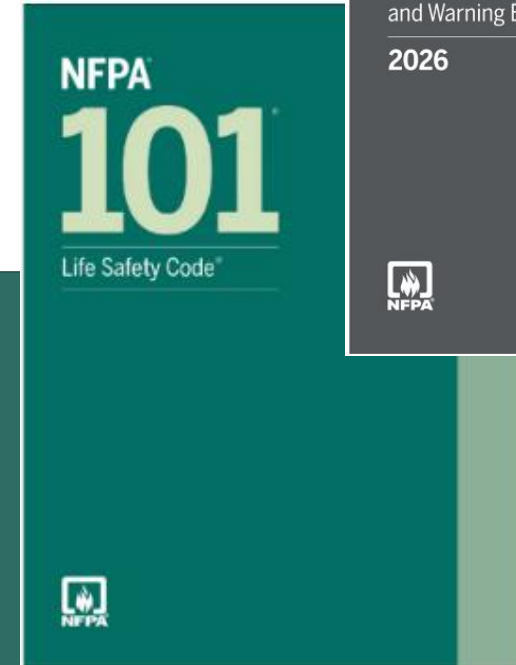
- January 2022, Westchester home
- Floor collapsed breaking house pipe
- FD evacuated consumers who were on the 2nd floor
- FD - 2.5% gas-in-air
- CE - .3% gas-in-air



Efforts to Socialize NGDs

NFPA

- NFPA 715 – Installation of Fuel Gas Detection & Warning Equipment
 - Requirements for installation of devices
 - **New Issue May 2022**
- NFPA 101 – Life Safety Code
 - Requirements for safety items by occupancy - Public Input to require in apt bldgs. & hotels
 - **Adopted into 2026 code**
- NFPA 1 – Fire Code
 - Installation requirements per NFPA 715 for occupancy's prescribed by NFPA 101
 - ***Not adopted***



Efforts to Socialize NGDs

International Code Council

- ICC – International Residential Building Code (IRBC) – 2022 ed. & 2025ed.
- *not accepted*
- ICC – International Fire Code (IFC) - 2026 edition – *not accepted*



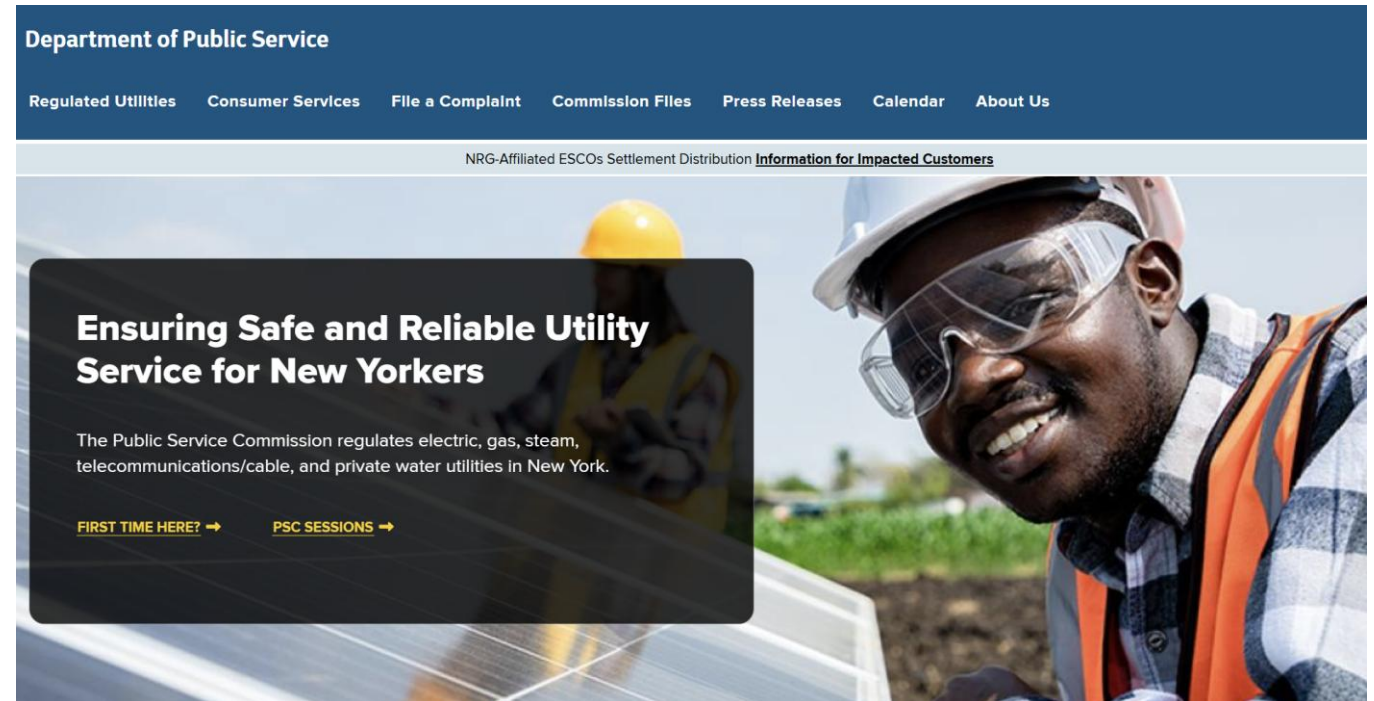
Efforts to Socialize NGDs

International Code Council

- ICC FCAC (Fire Code Action Committee) Work Group #2 (WG2) on Active Fire Protection
 - created NGD taskforce to pursue development of proposals for the next revision cycles to both the IFC and IBC.

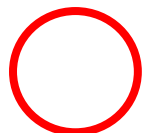
Customer Rate Touches

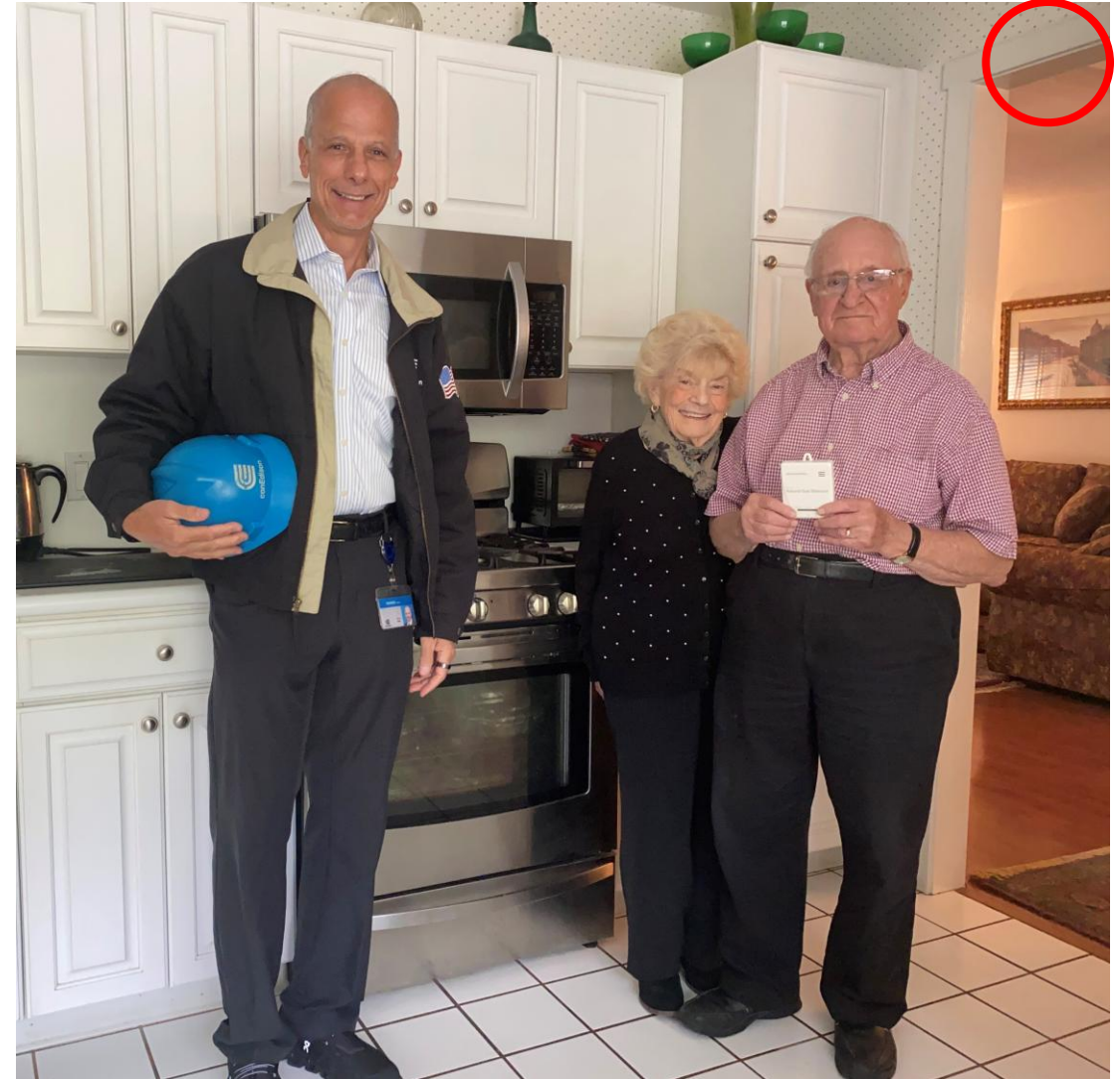
- NGD program rate based
- Service Line Inspection (SLI)
 - Device required for service
 - Business District (BD) SLI extended from *annual* to *5 yrs*
- Discussions for future
 - Non BD SLI – changing 5 yrs to 10 yrs due to no history of corrosion and presence of NGD



Customer Leak Detection

- September 2025, Westchester residence
- Burner left on after cooking
- Alarm activation – audible message
“Gas leak detection evacuate and call 911” **AND THAT’S WHAT THEY DID!**

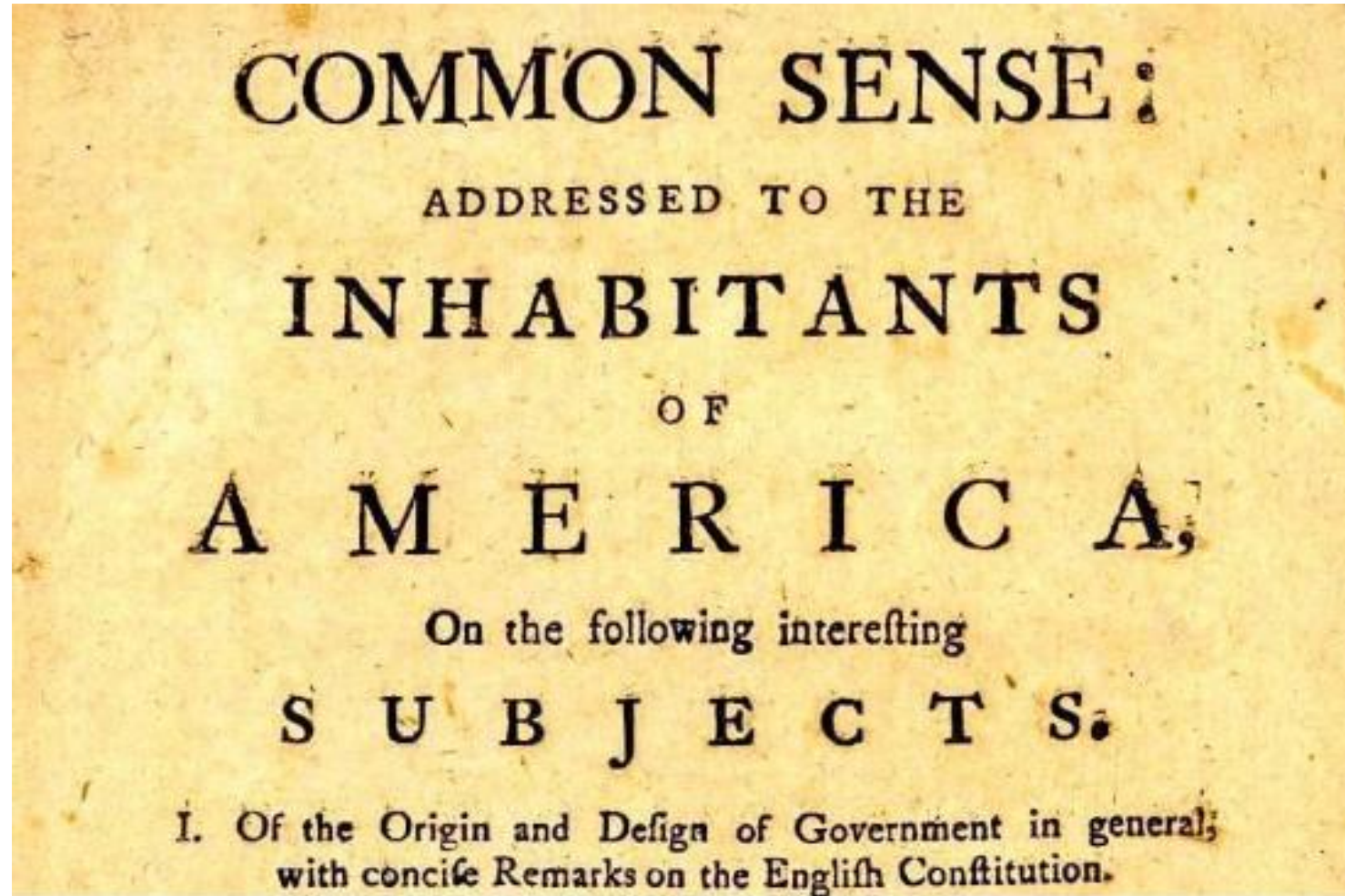
 NGD installed LR side of door jam



9th GLA – Thomas Paine's Cottage, New Rochelle NY



Residential Natural Gas Detectors are simply



Con Edison AMI Enabled Natural Gas Detector Program

Rick Trieste
Department Manager
Research, Development & Demonstration

