



NARUC

Summer Committee Meetings

Committee On Gas

**Natural Gas Pipeline Locators -- Safety and Damage
Prevention Power in Cooperation**



NARUC

Summer Committee Meetings

July 24-27, 2016



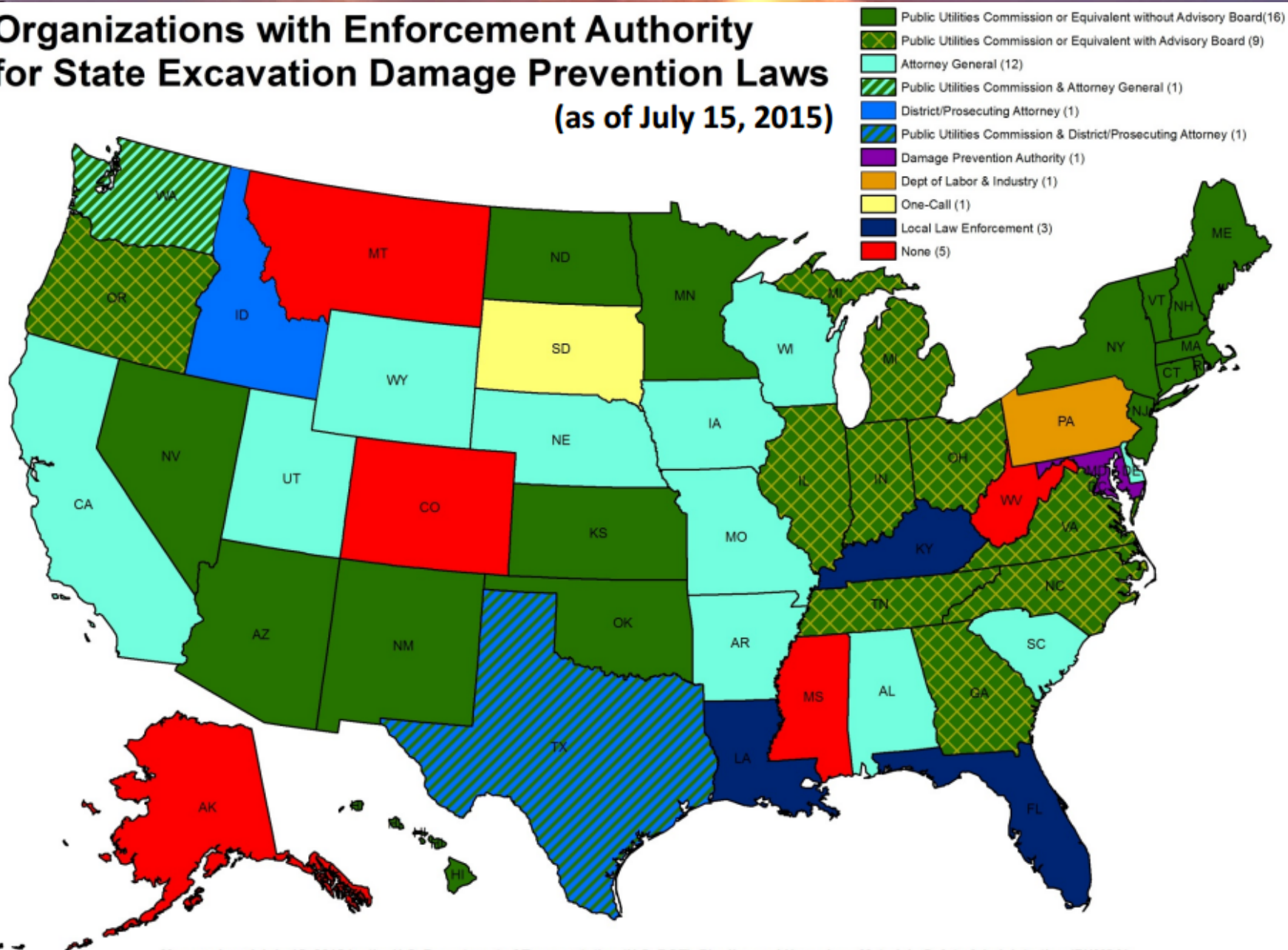
NARUC

Natural Gas Pipeline Locators

July 26, 2016

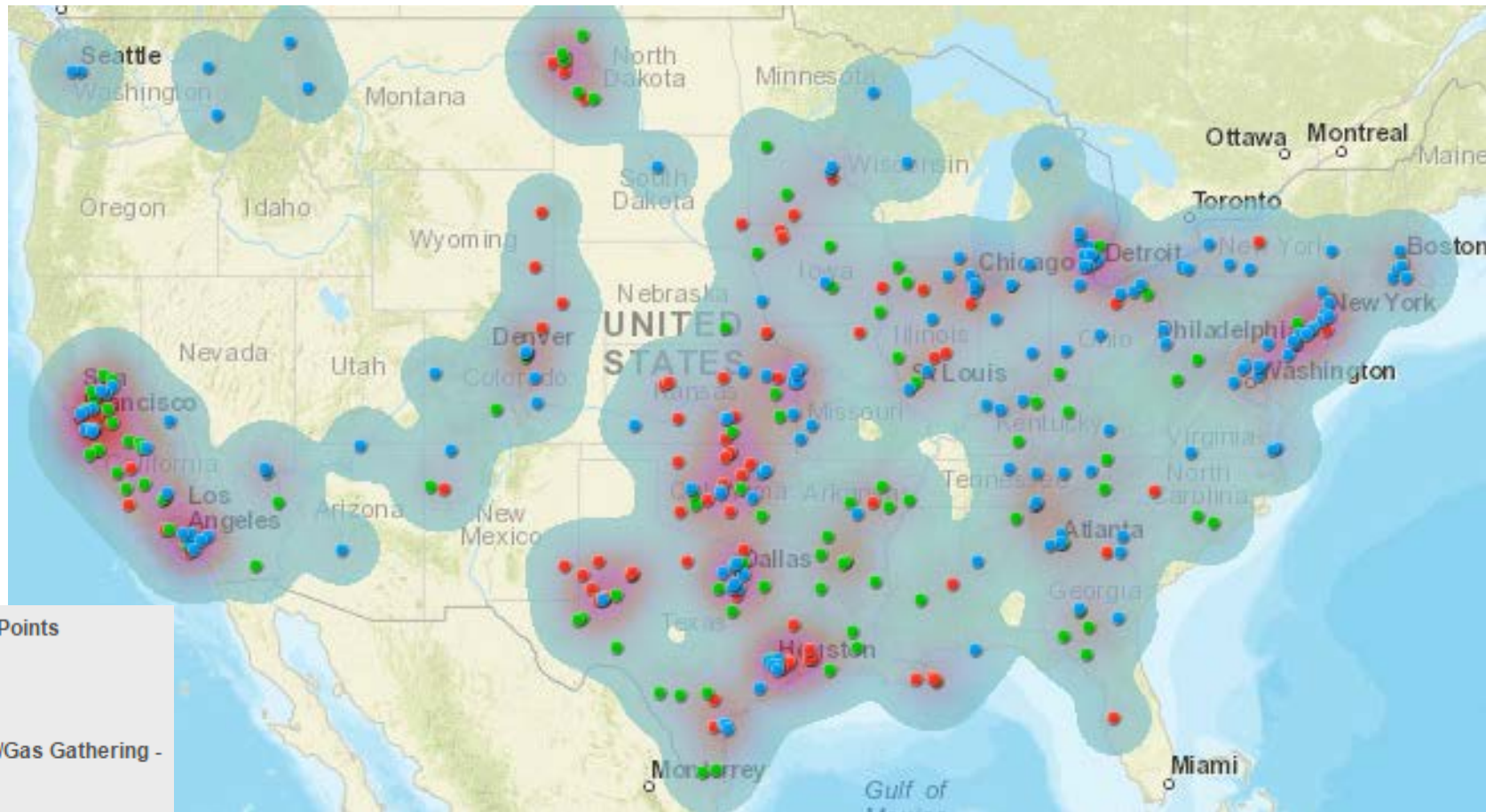
**Federal
Statistics
Incidents**

Organizations with Enforcement Authority for State Excavation Damage Prevention Laws (as of July 15, 2015)



Map produced July 15, 2015 by the U.S. Department of Transportation (U.S. DOT), Pipeline and Hazardous Materials Safety Administration (PHMSA)
 Map provided as a reference only. PHMSA makes no representations or warranties of any kind, express or implied, about the completeness, accuracy, reliability, suitability or availability with respect to this map for any purpose. PHMSA expressly disclaims liability for errors and omissions in the contents of this map.

Federal Reportable Pipeline Incidents Caused by Excavation Damage 2010 through March 31, 2016



Gas Distribution - Points



Gas Transmission/Gas Gathering -
Points

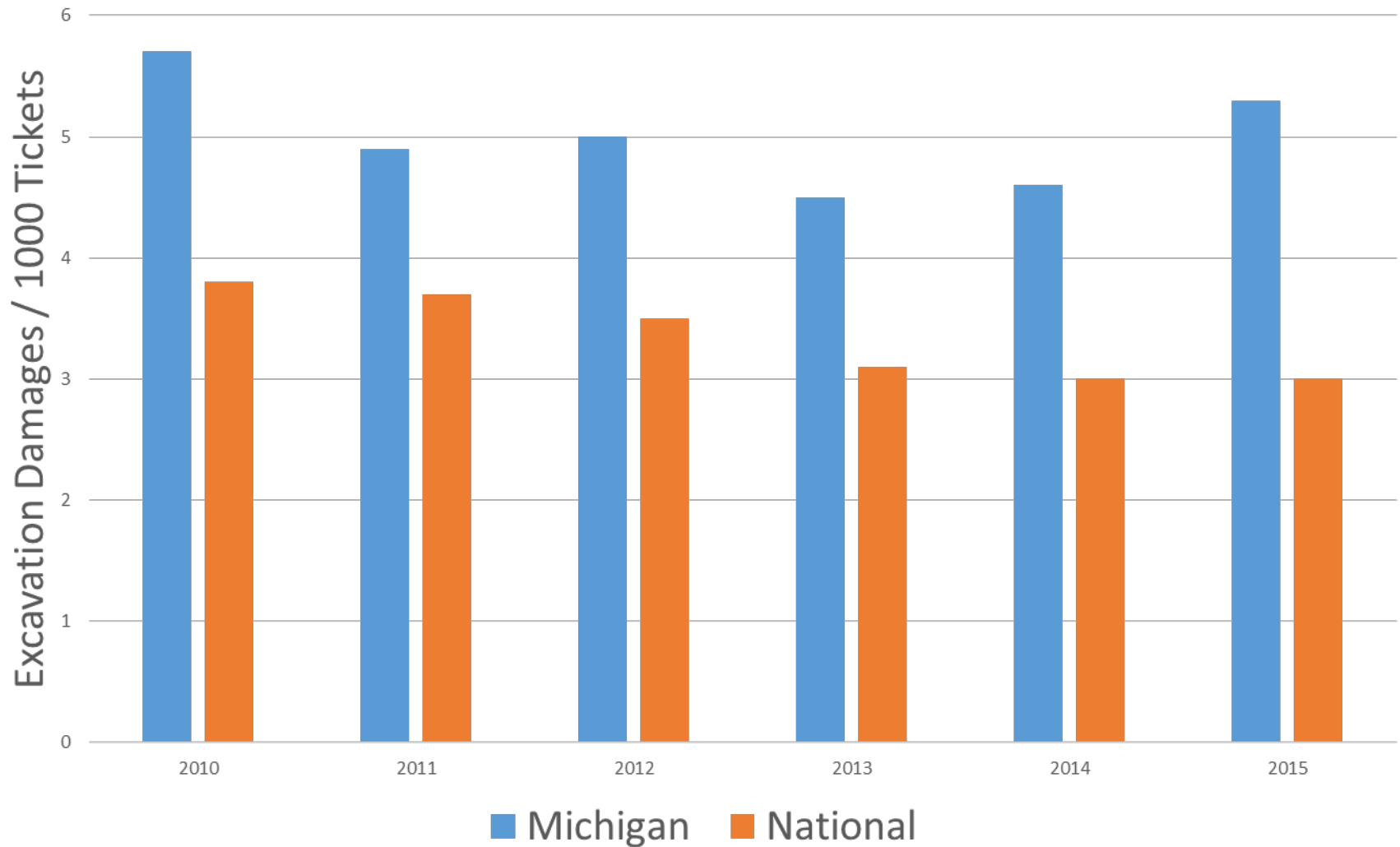


Hazardous Liquid - Points



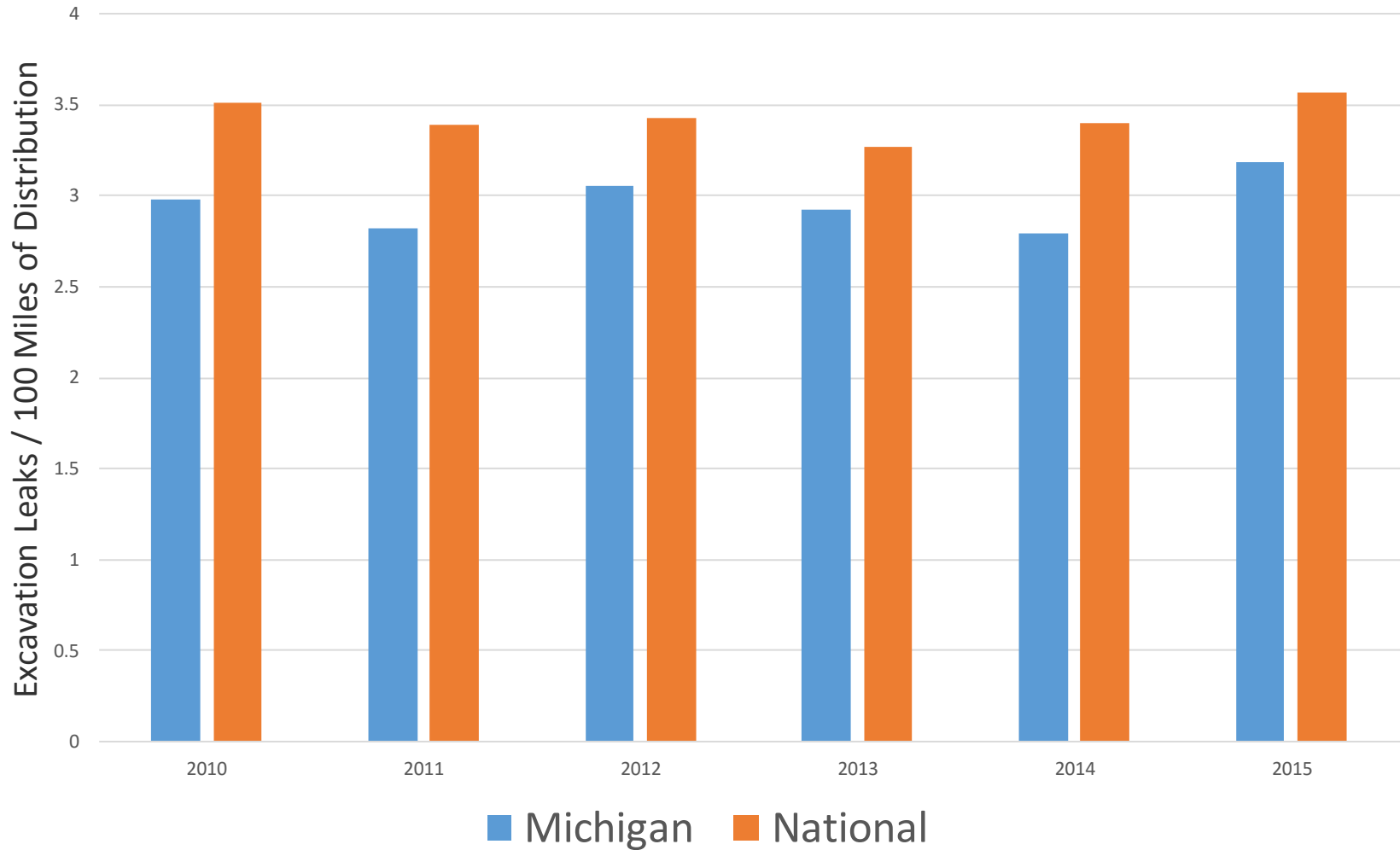
Source: <http://primis.phmsa.dot.gov/comm/DamagePrevention.htm?nocache=7090>

Damages



Source: 2010-2015 Annual Distribution Reports. Form PHMSA F7100.1-1

Damages



Communications



Depth



Cross-bore



Thank You

David Chislea
Manager, Gas Operations
Michigan Public Service Commission
(517) 284-8231
chislead@michigan.gov



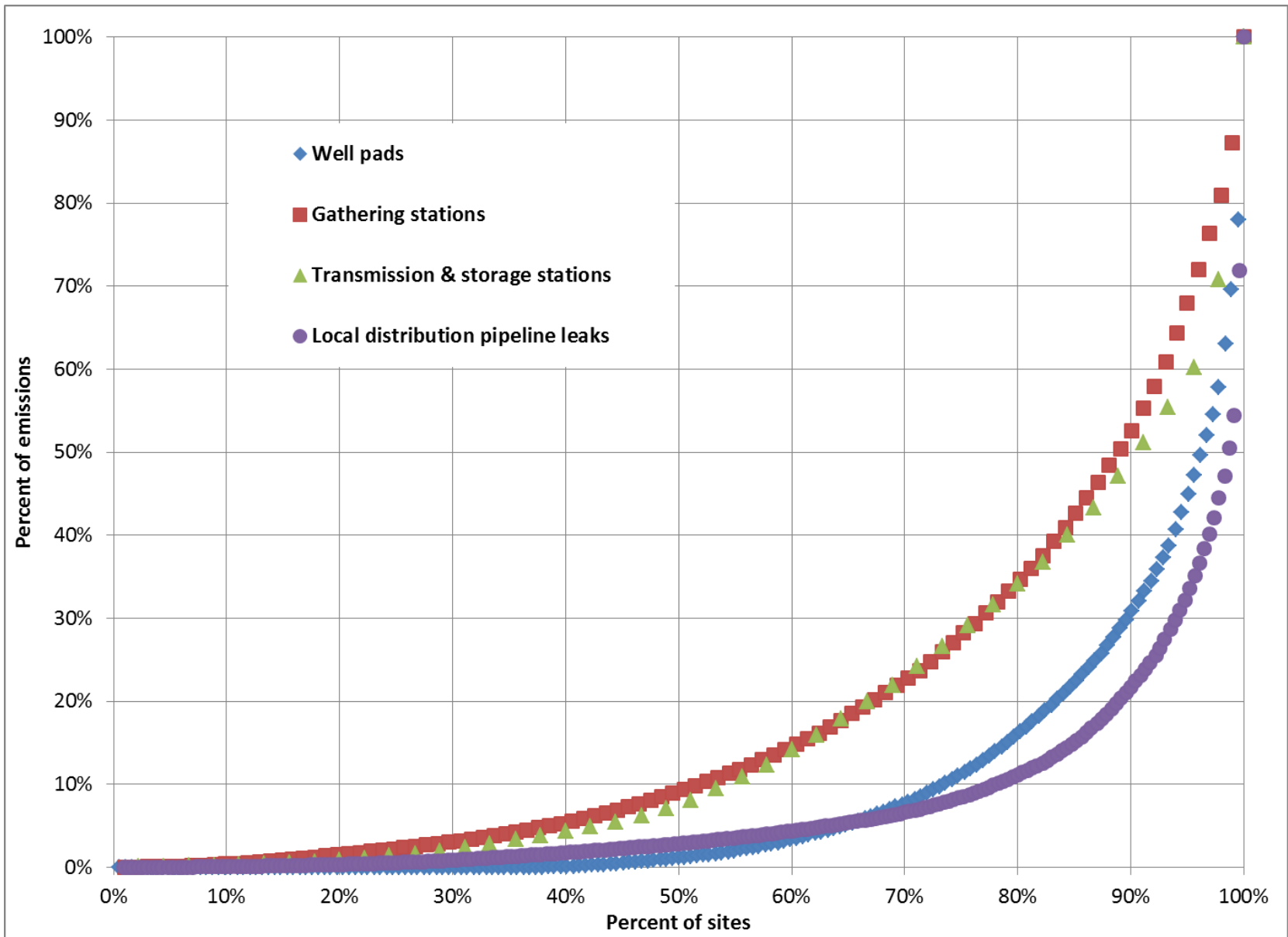
Spatial Analytics: Optimizing Leak Abatement with Natural Gas Locational Services

NARUC Summer Meetings - July 26, 2016



N. Jonathan Peress
Environmental Defense Fund

A small fraction of sites and components contributes the majority of emissions.



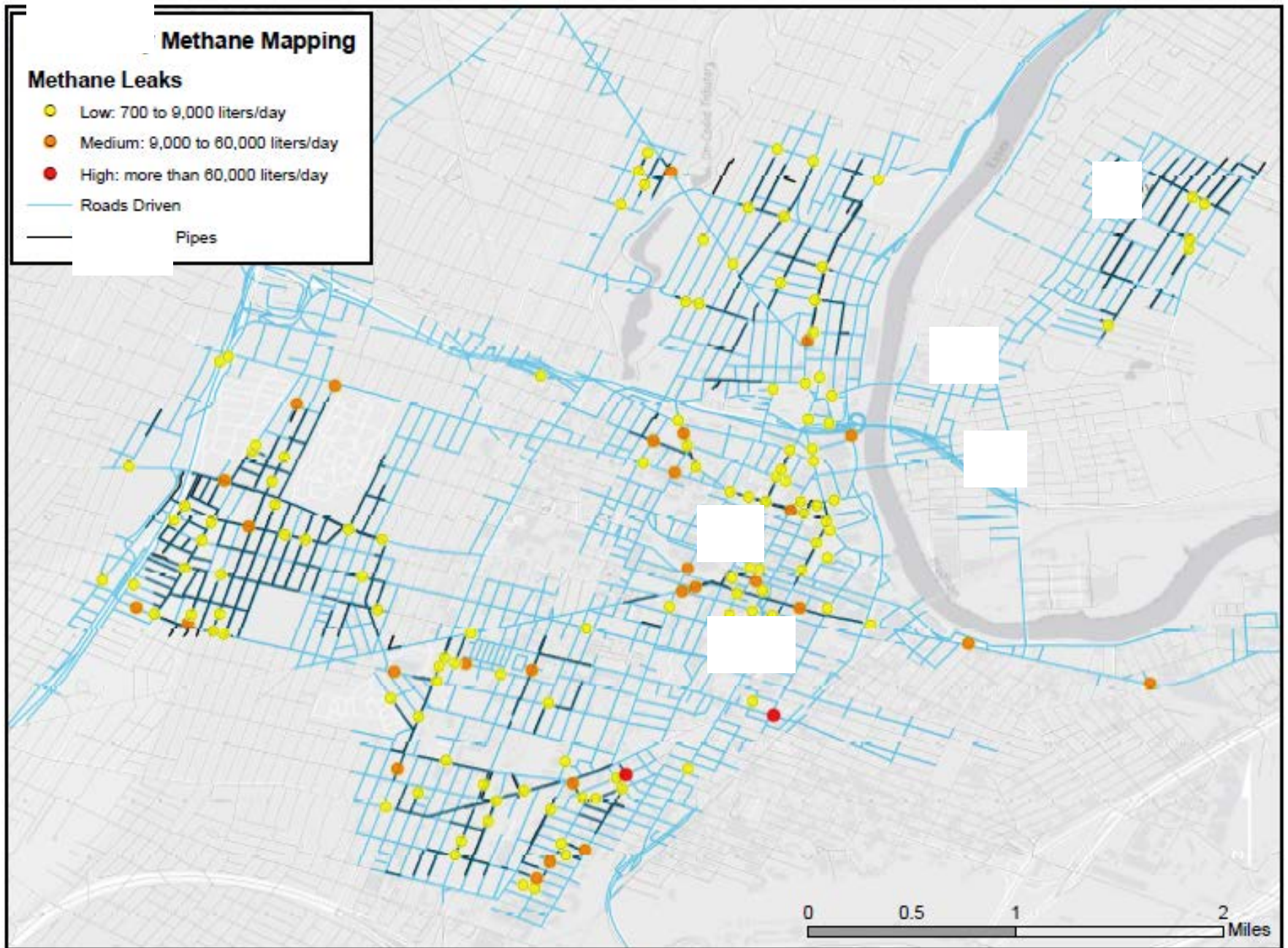
Methane Mapping

Methane Leaks

- Low: 700 to 9,000 liters/day
- Medium: 9,000 to 60,000 liters/day
- High: more than 60,000 liters/day

— Roads Driven

— Pipes

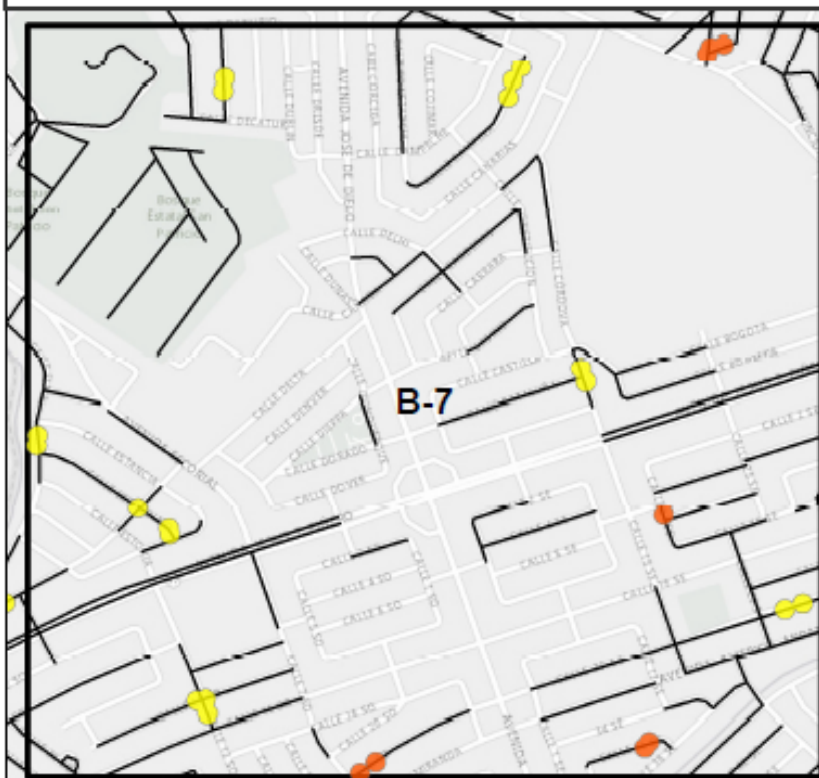


Overlap of Utility Pipes and Observed Data from EDF Methane Mapping

Observed Readings

Clusters of readings that contribute to one verified leak of the following size:

- 700 to 9,000 liters/day
- 9,000 to 60,000 liters/day
- More than 60,000 liters/day
- Grid No.
- Utility Pipes



Overlap of Utility Pipes and Verified Leaks from EDF Methane Mapping

Verified Leaks

- 700 to 9,000 liters/day
- 9,000 to 60,000 liters/day
- More than 60,000 liters/day
- Grid No.
- Utility Pipes

Estimated Total Flow Rate: 34.6 (+/- 6.0*) L/min

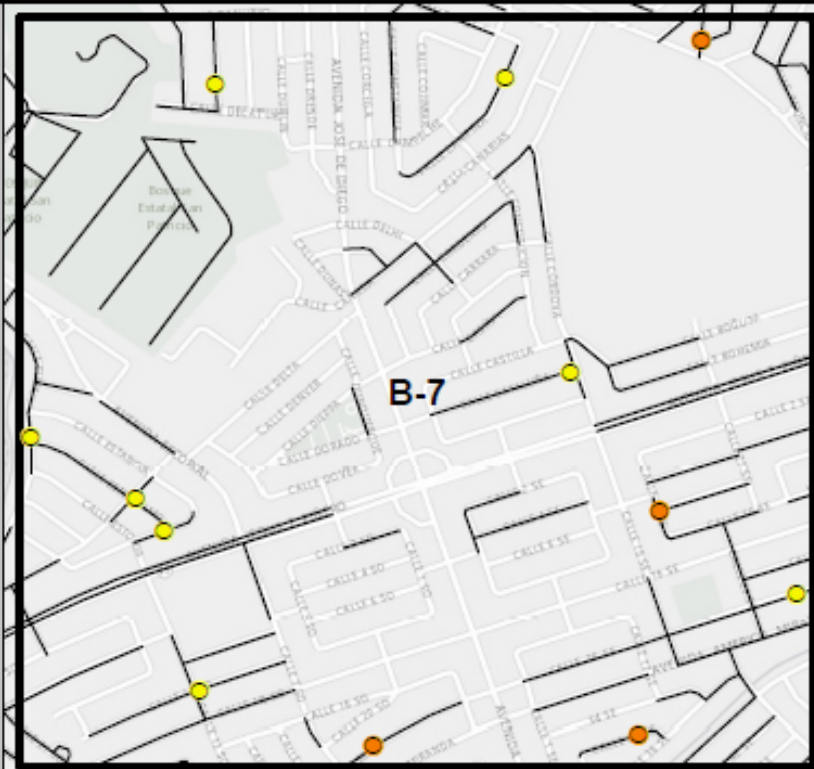
Number of Verified Leaks: 12

Miles of Pipe: 7.4 miles

Flow Rate/Mile Pipe: 4.7 (+/- 0.8*) L/min/mile

Rank: 17

* Represents 95% confidence of true leak rate



These maps only show readings that overlap with utility pipes.
Other recorded data is not represented.

0 1,000 2,000
Feet

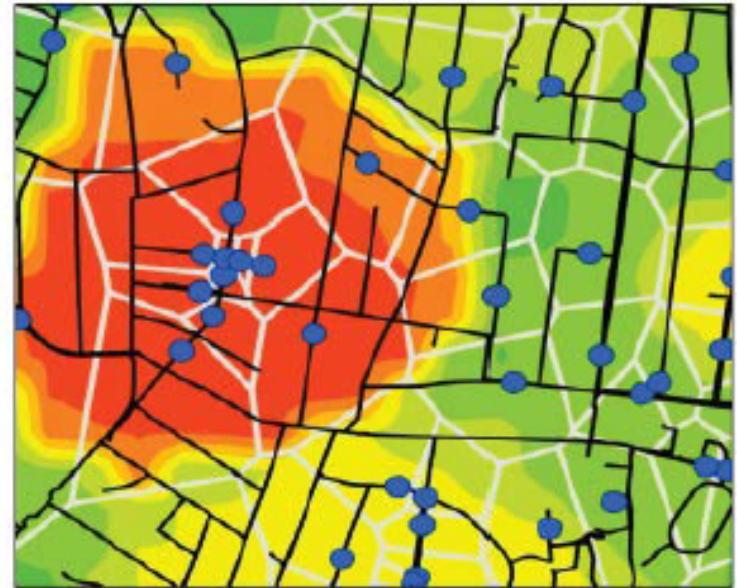
Leak-Prone Pipe / Replacement Grid Flow Ranking

Grid	Drive Order	No. Verified Leaks in Grid	Total Estimated Flow Rate (L/min)	Measure of Uncertainty	Miles of UPCI Pipe in Grid	Estimated Flow Rate (L/min) per Mile	Measure of Uncertainty	Rank By Total Estimated Flow Rate	Rank by Estimated Flow Rate per Mile
A-1	1	10	142.0	26.94	19.3	7.36	1.40	5	12
A-2	2	17	98.7	14.36	16.8	5.88	0.85	7	14
A-4	3	6	30.2	7.40	3.9	7.74	1.90	17	9
A-7	4	13	90.6	15.08	24	3.78	0.63	9	19
B-2	5	12	45.5	7.88	8.8	5.17	0.90	15	15
B-3	6	8	88.4	18.75	18.7	4.73	1.00	11	16
B-5	7	22	183.3	23.45	9.3	19.71	2.52	1	1
B-7	8	12	34.6	5.99	7.4	4.68	0.81	16	17
B-8	9	24	166.8	20.43	11.3	14.76	1.81	2	3
C-1	10	13	142.3	23.68	17.1	8.32	1.38	4	7
D-5	11	8	24.2	5.13	3.2	7.56	1.60	19	11
D-6	12	0	0.0	N/A	7.2	0.00	N/A	20	20
D-8	13	26	163.9	19.29	9.7	16.90	1.99	3	2
F-2	14	16	55.5	8.33	7.3	7.60	1.14	14	10
F-3	15	11	66.6	12.05	9.3	7.16	1.30	12	13
F-6	16	4	27.8	8.34	6.5	4.28	1.28	18	18
G-1	17	6	93.0	22.78	7.1	13.10	3.21	8	4
H-2	18	10	88.5	16.79	11	8.05	1.53	10	8
H-4	19	5	60.6	16.26	6.2	9.77	2.62	13	6
H-6	20	19	102.9	14.16	8.8	11.69	1.61	6	5
		Total Estimated Flow Rate	1,705.40						

PSE&G using data after applying Hazard Index algorithm to prioritize parcels

New locational methods and sensors (e.g., Picarro) being integrated by utilities

- PG&E, CenterPoint Energy, EDF UNU analysis finds 3 to 5 times more leaks than standard (e.g., FI)
- Integration of Current Systems
 - Assessment Tool (Picarro Technology)
 - Soil Data
 - GIS
 - Historical Leak Data
 - DIMP Data



Source: CenterPoint Energy Presentation
July 2015

How spatial analytics can empower asset management for gas utility companies PWC – April 2016

- “By integrating spatial analytics’ predictive modelling with risk-based integrity management programs, utilities can meaningfully improve their asset integrity, investment decisions and deployment of people, processes and technologies.” –Source: PWC

Figure 2: Spatial analytics modeling steps

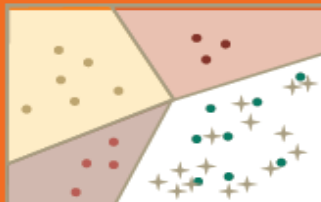
Clustering Analysis

- Filter data for above/ below ground leaks
- Map open and repaired leaks and customer calls
- Deploy clustering algorithms



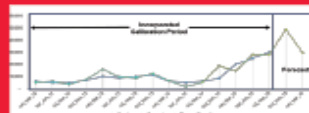
Condition Assessment Integration

- Map condition assessment data
- Assign condition assessment data to clusters



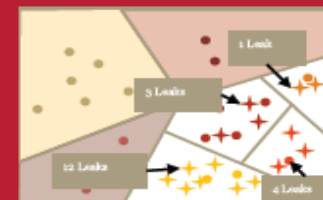
Predictive Modeling

- Create weighted master data set
- Model calibration and validation
- Forecast future indications
- Aggregate annual forecast



Hot Spot Analysis

- Bin network according to clusters
- Assigned weight to points in bins
- Distributed cluster rate forecast to bins



Project Level Predictions

- Calculate indications for GIS segments based on locations within bins and segment length
- Aggregate forecasts for DIMP projects

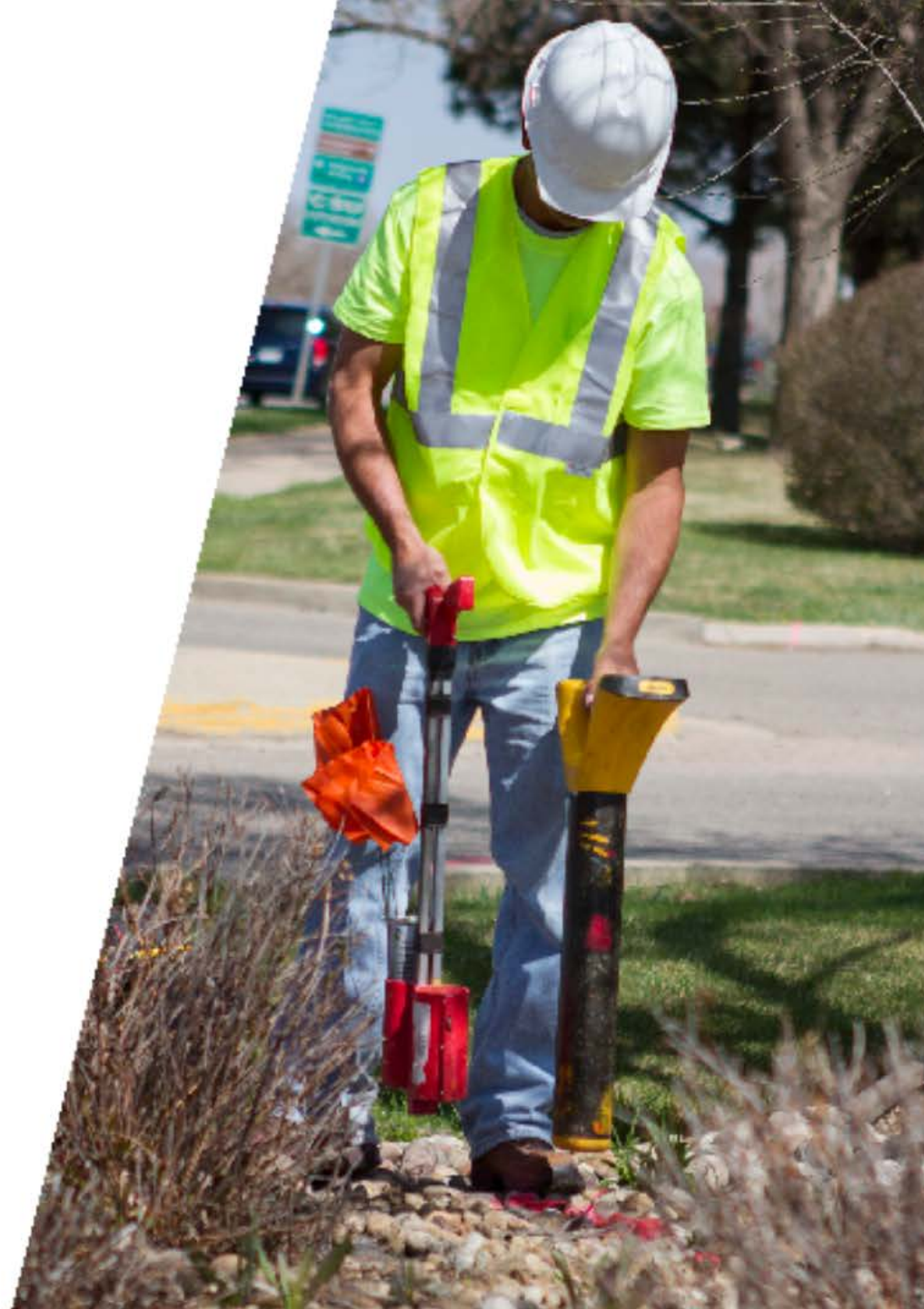
$$(1.2 \text{ lks}) / (1000 \text{ ft}) (2,400 \text{ ft}) + (0.6 \text{ lks}) / 1000 \text{ ft} (500 \text{ ft}) = 3.2 \text{ leaks}$$

PROJECT	Pred. Leaks	Grade
99998	0.22	A
99998	0.77	B
99998	2.43	C



Rob Tullman
President & CEO

26 July 2016



Locating & Marking



48-72 Hours

170 Million/Yr

Locate Requests

One Call



Utility



Marked By

70% Contractor

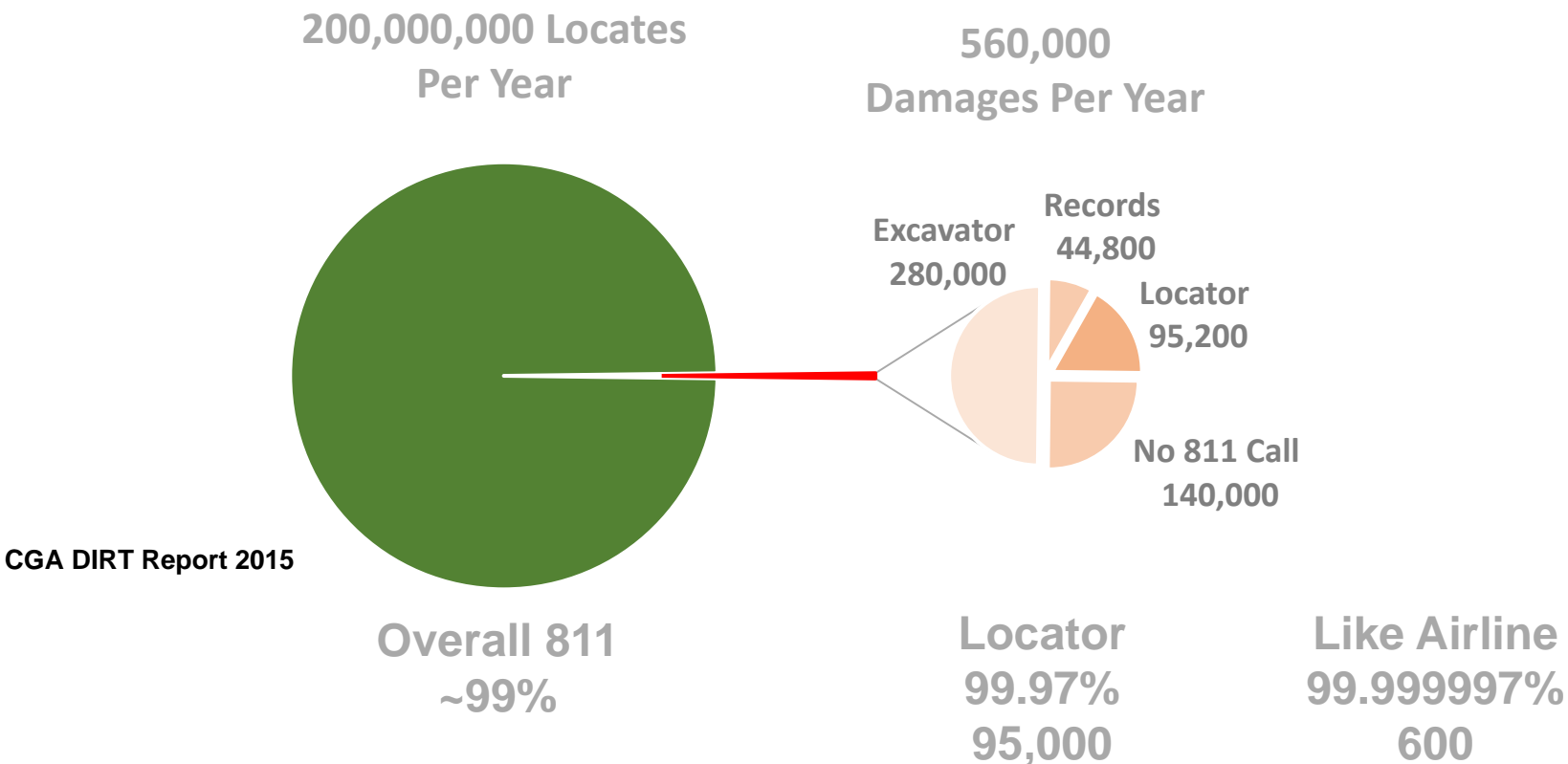
30% In House

2014 Data

**Know what's below.
Call  before you dig.**

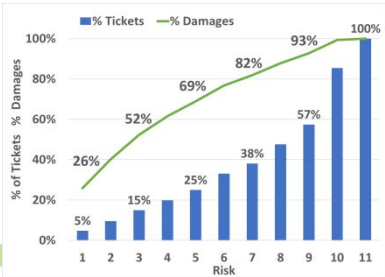
THE LEADER IN DAMAGE PREVENTION

If we were an airline...

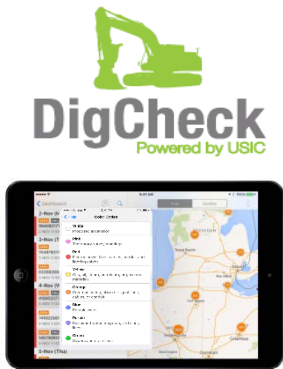


We would crash 10 Planes / week
Need to Be Better Where Risk is High
Use Data / Technology To Keep Costs Down

Tools Available



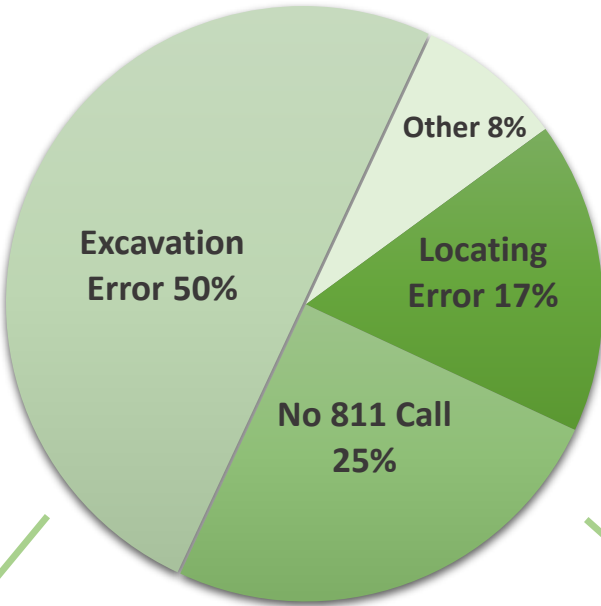
High Risk Intervention



Communication



Audits



Qualification

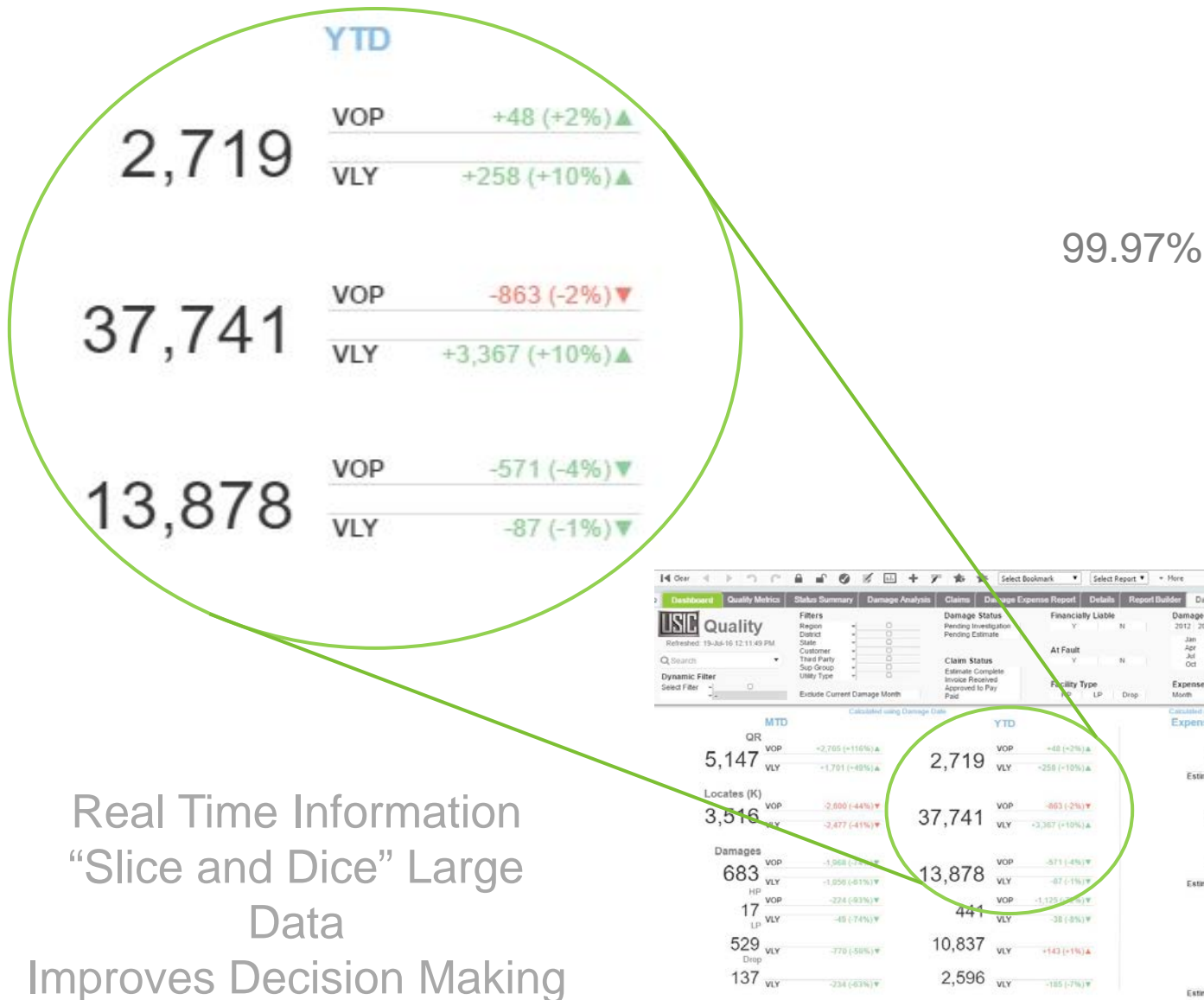
1.5 TB / Day



Know what's below.
Call before you dig.

Education

Terabytes of Data to Focus Efforts



Share Data; Communicate; Educate

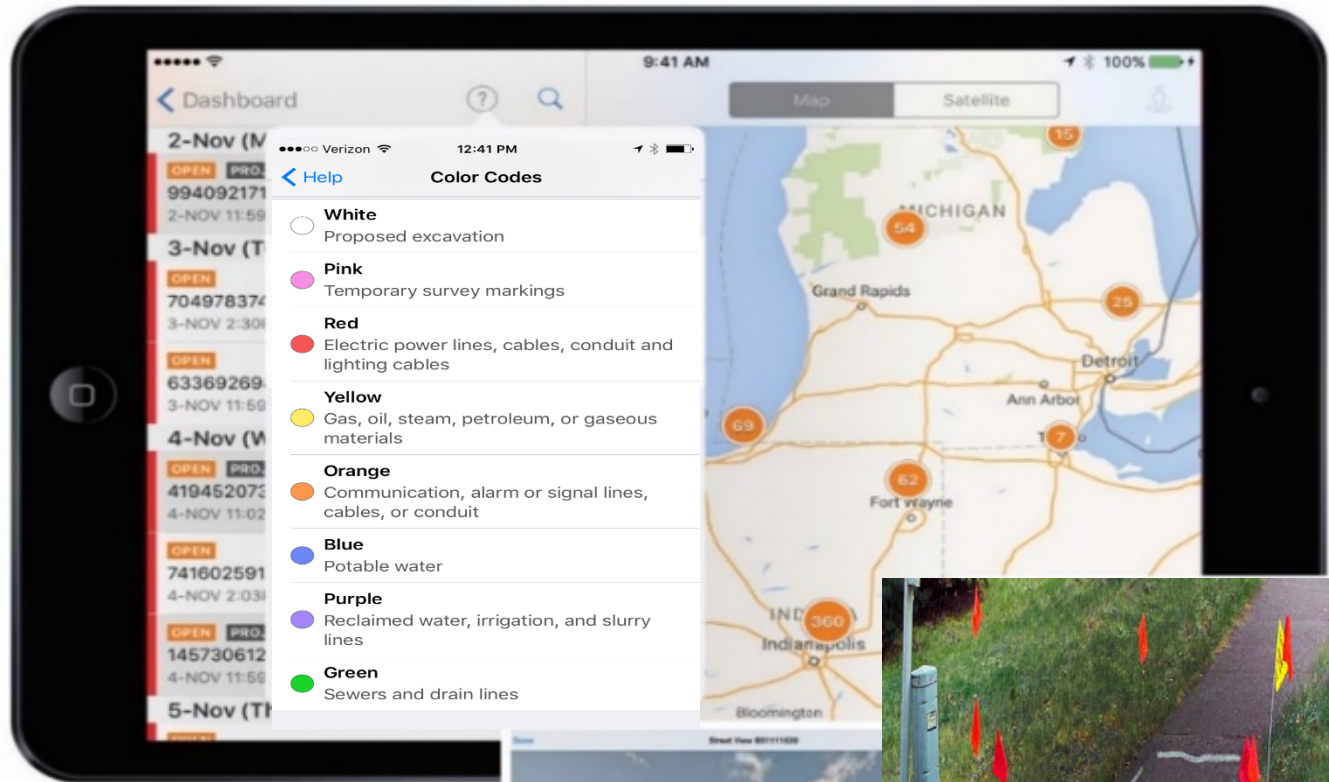


Real Time Data
Pictures, Video
Notes

Efficient

Economic
Upside For
Excavators

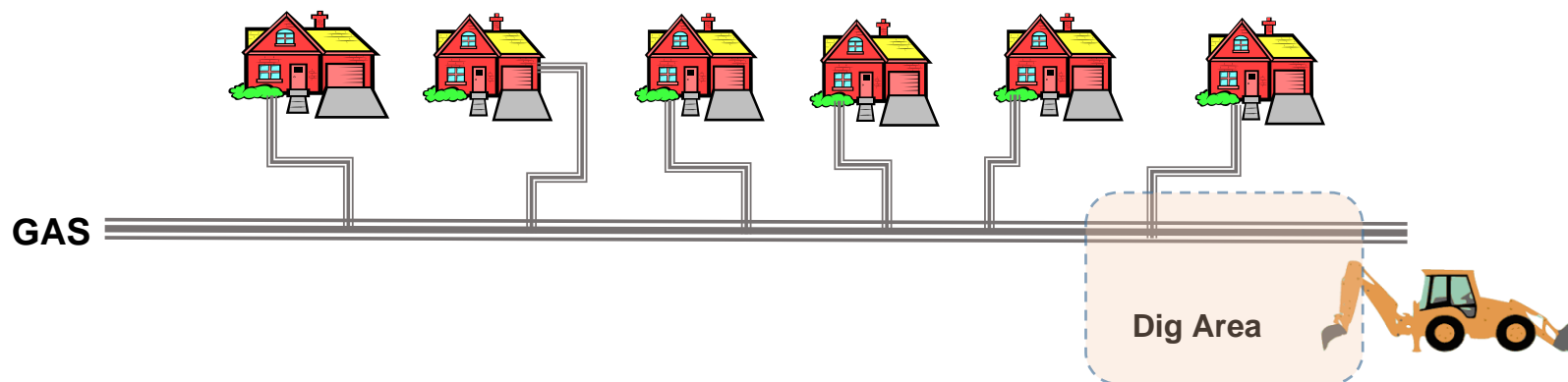
Street View
Integration



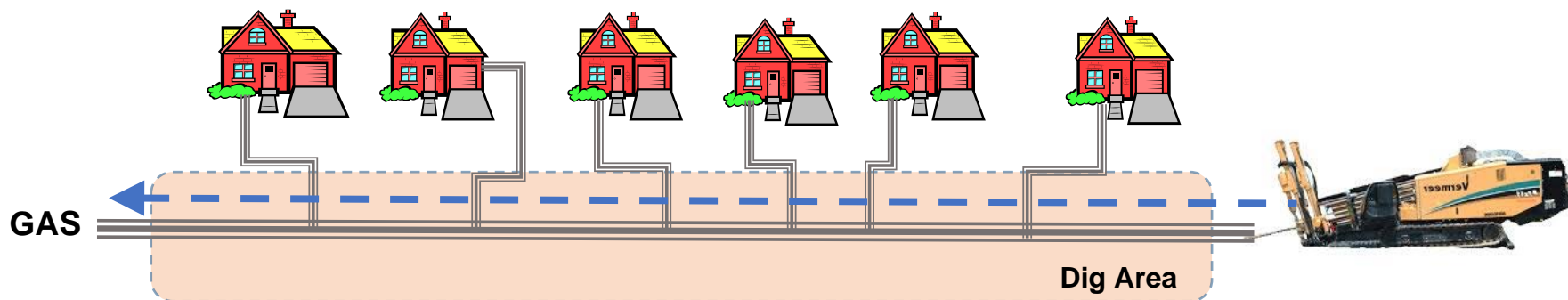
THE LEADER IN DAMAGE PREVENTION

Excavation Methods

Traditional Excavation

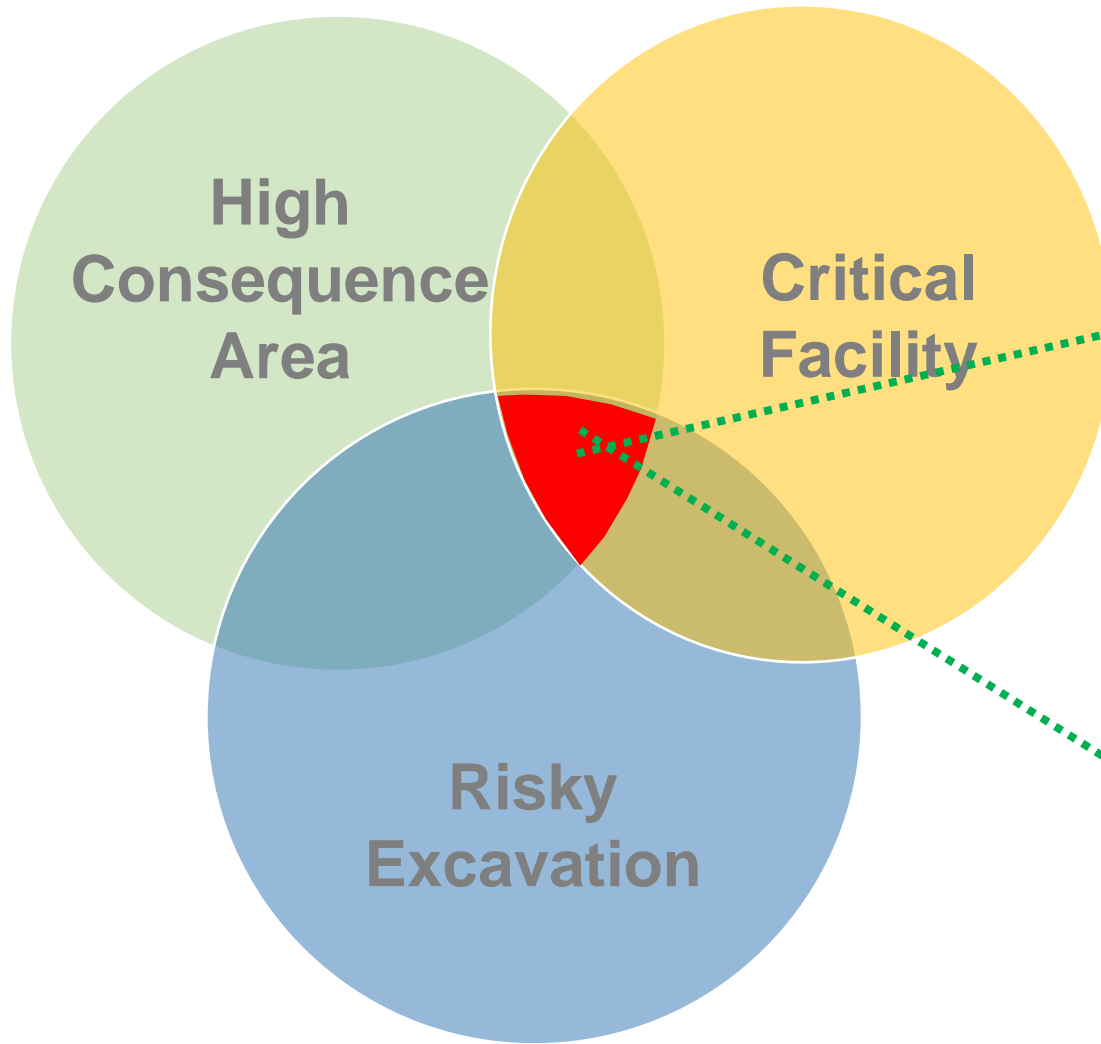


Directional Boring



Risk +6x

Boots on the Ground Where Required



Technology to Identify

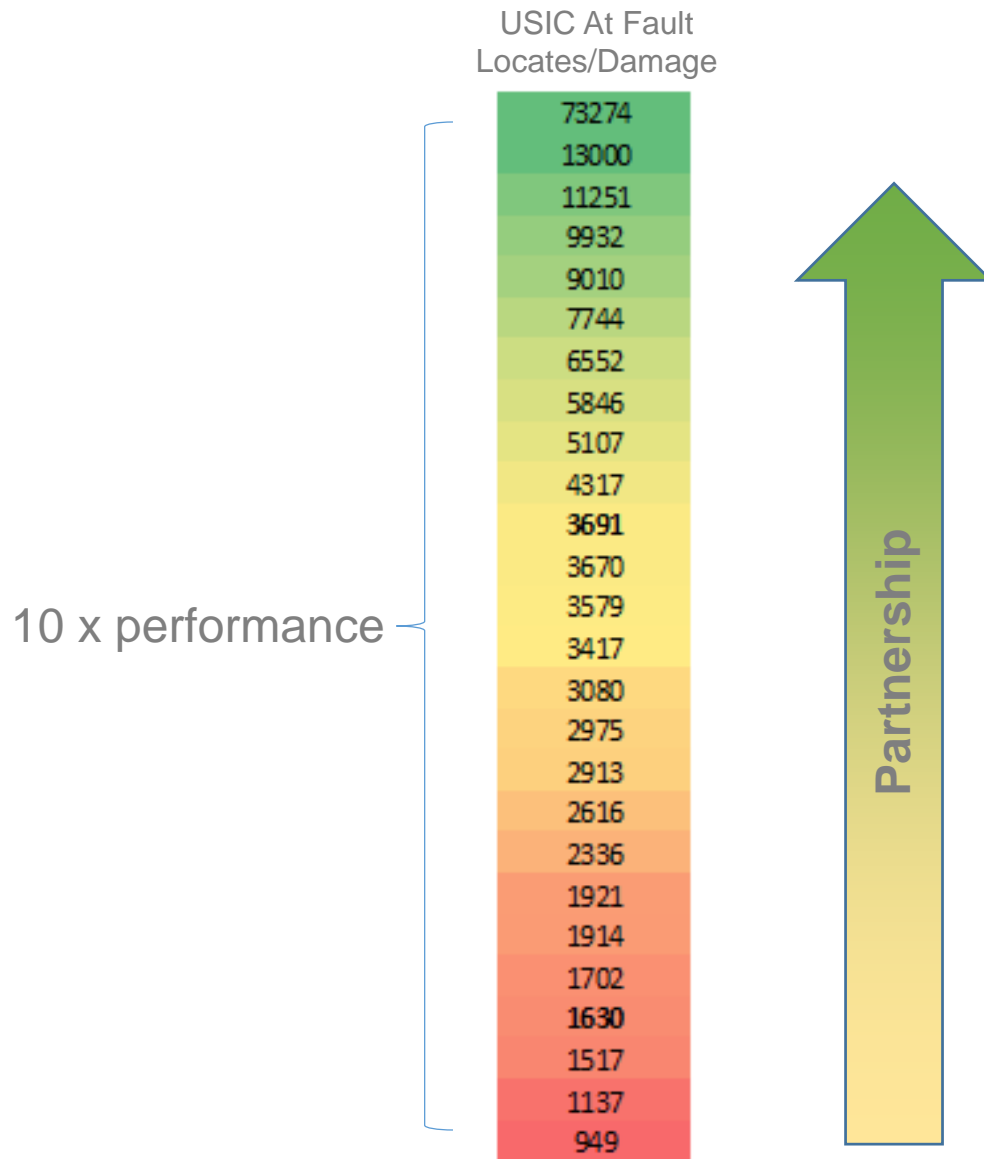


Field Action
to Mitigate
Risk



50% of the Risk in 15% of the Digs

Gas Locating Performance



Damage Prevention

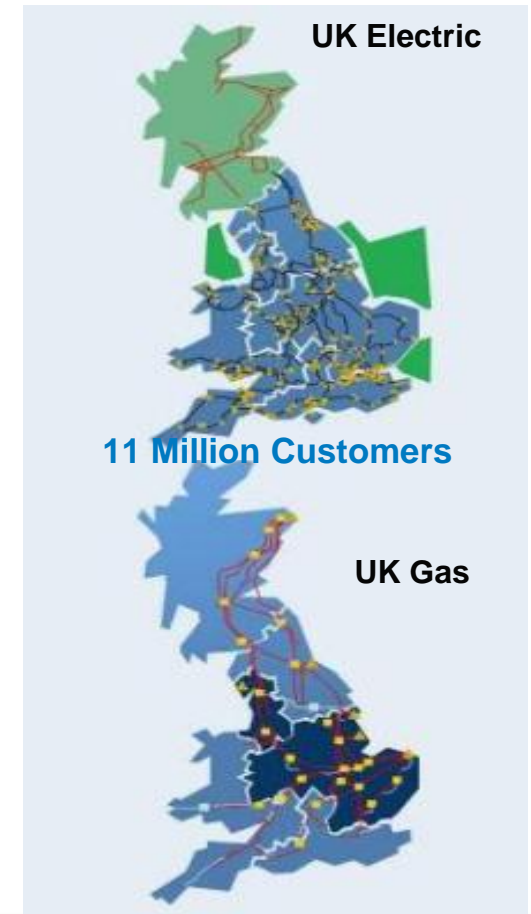
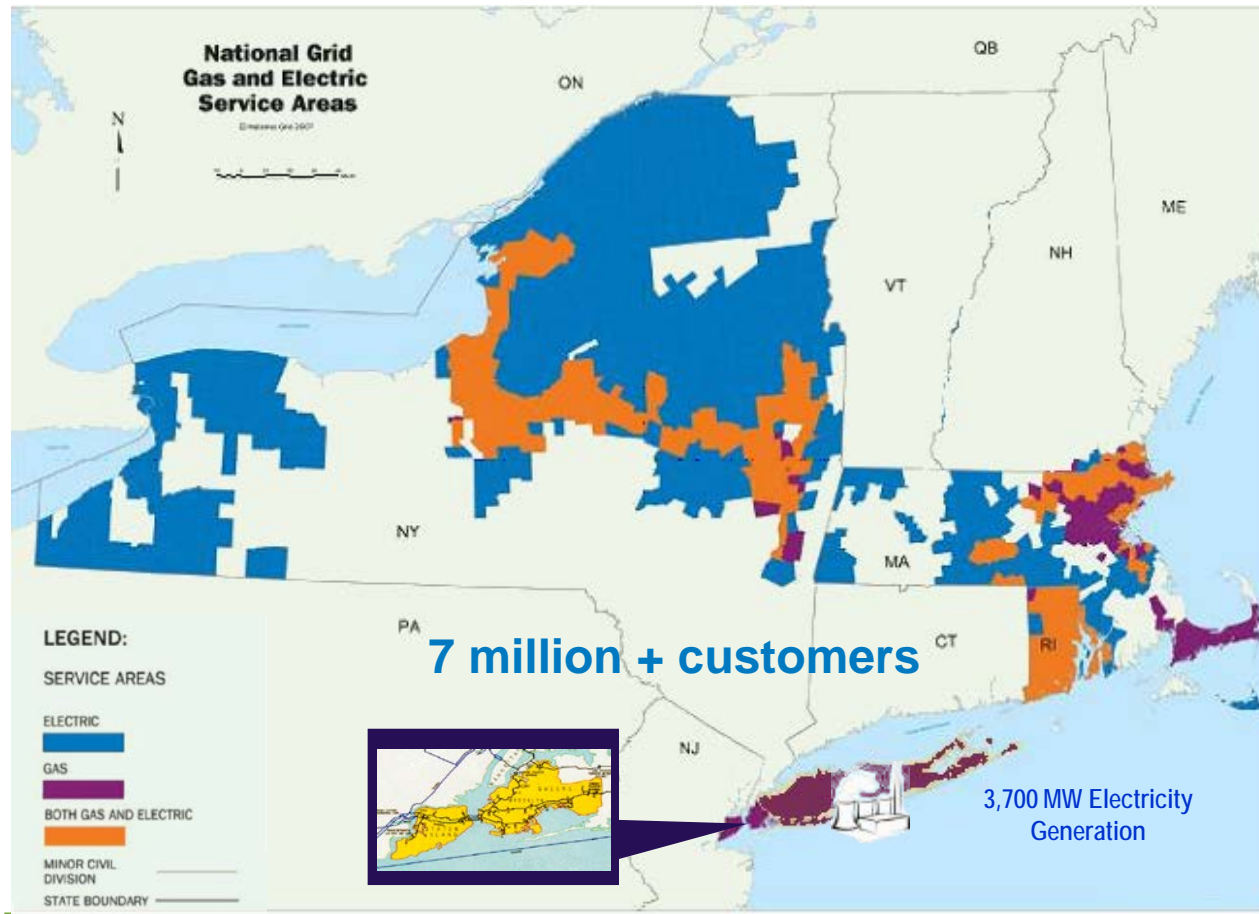


Robert DeMarinis

NARUC Meeting
July 26, 2016

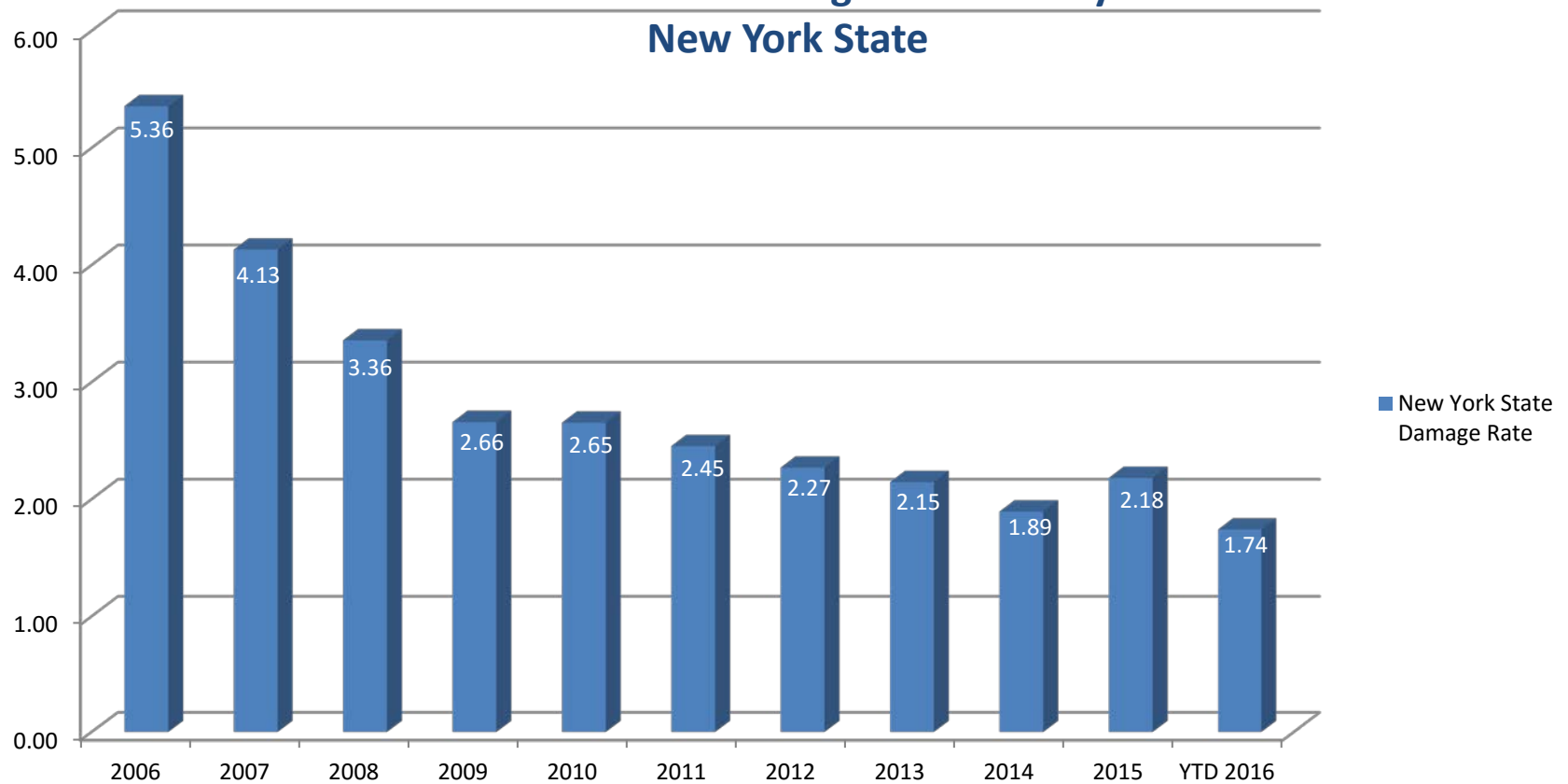
An International Energy Company

nationalgrid
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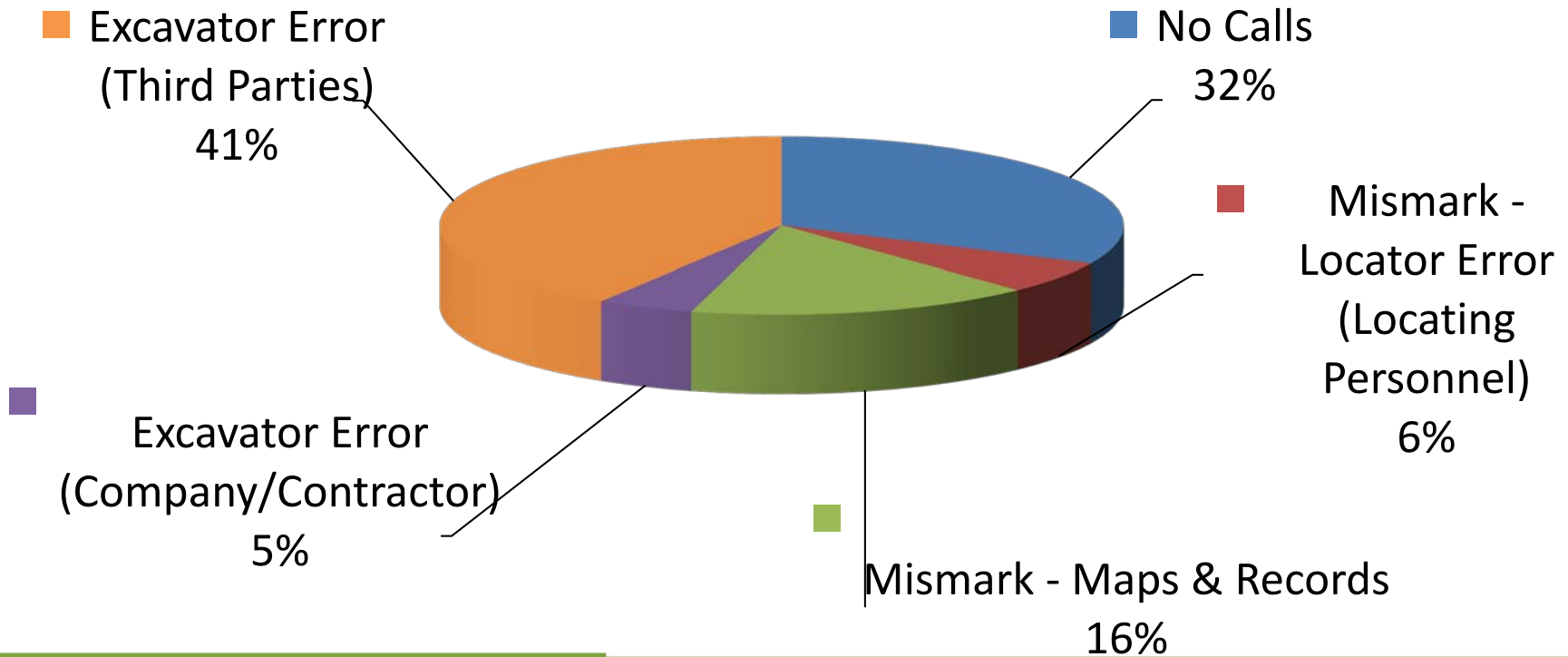
Damage Prevention Data

**National Grid Damage Rate History
New York State**



Damage Prevention Data

Long Island Root Cause Breakdown YTD June 2016

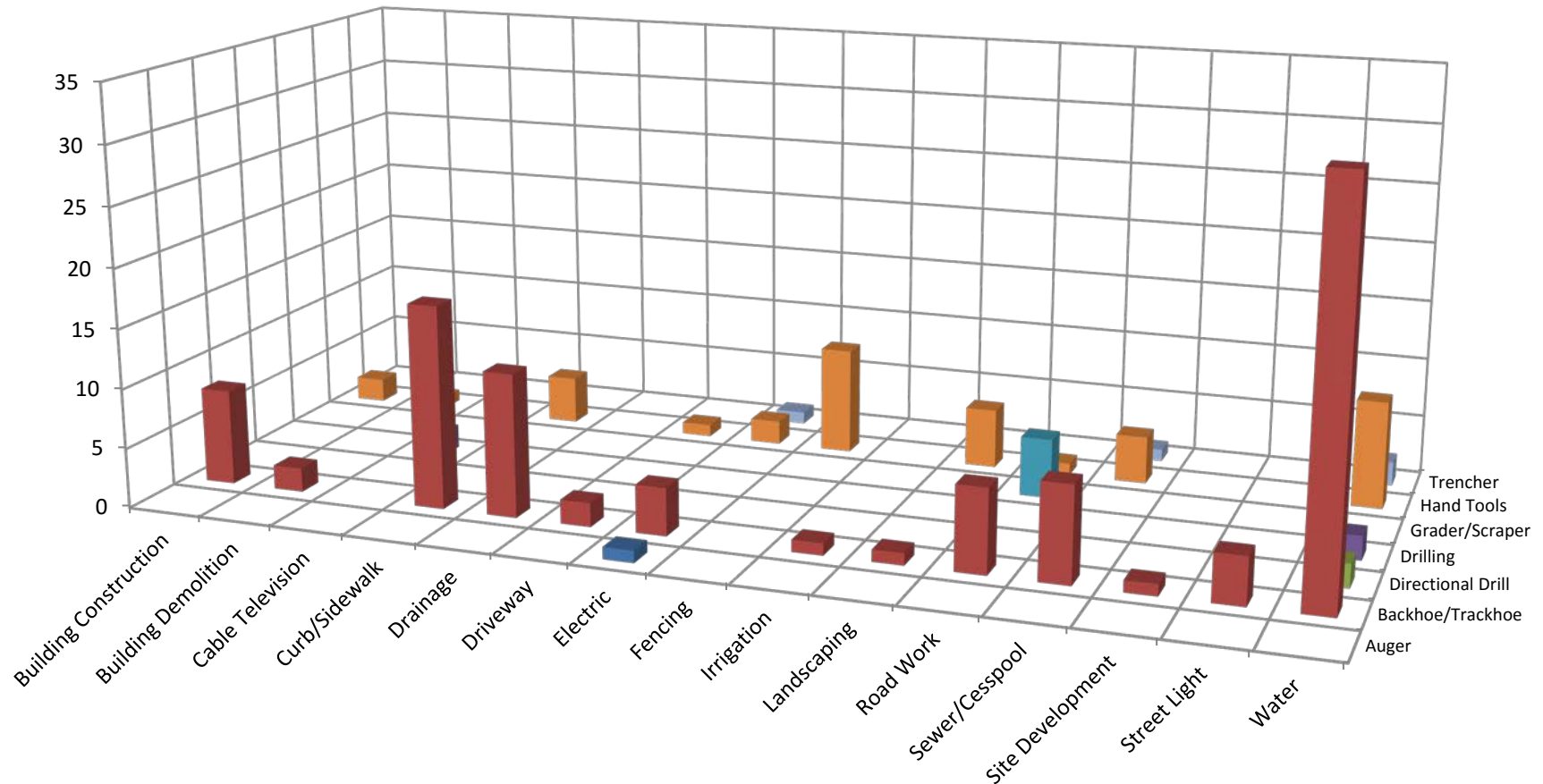


Long Island "Excavator Error" Damages

Type of Work / Equipment

June 2016

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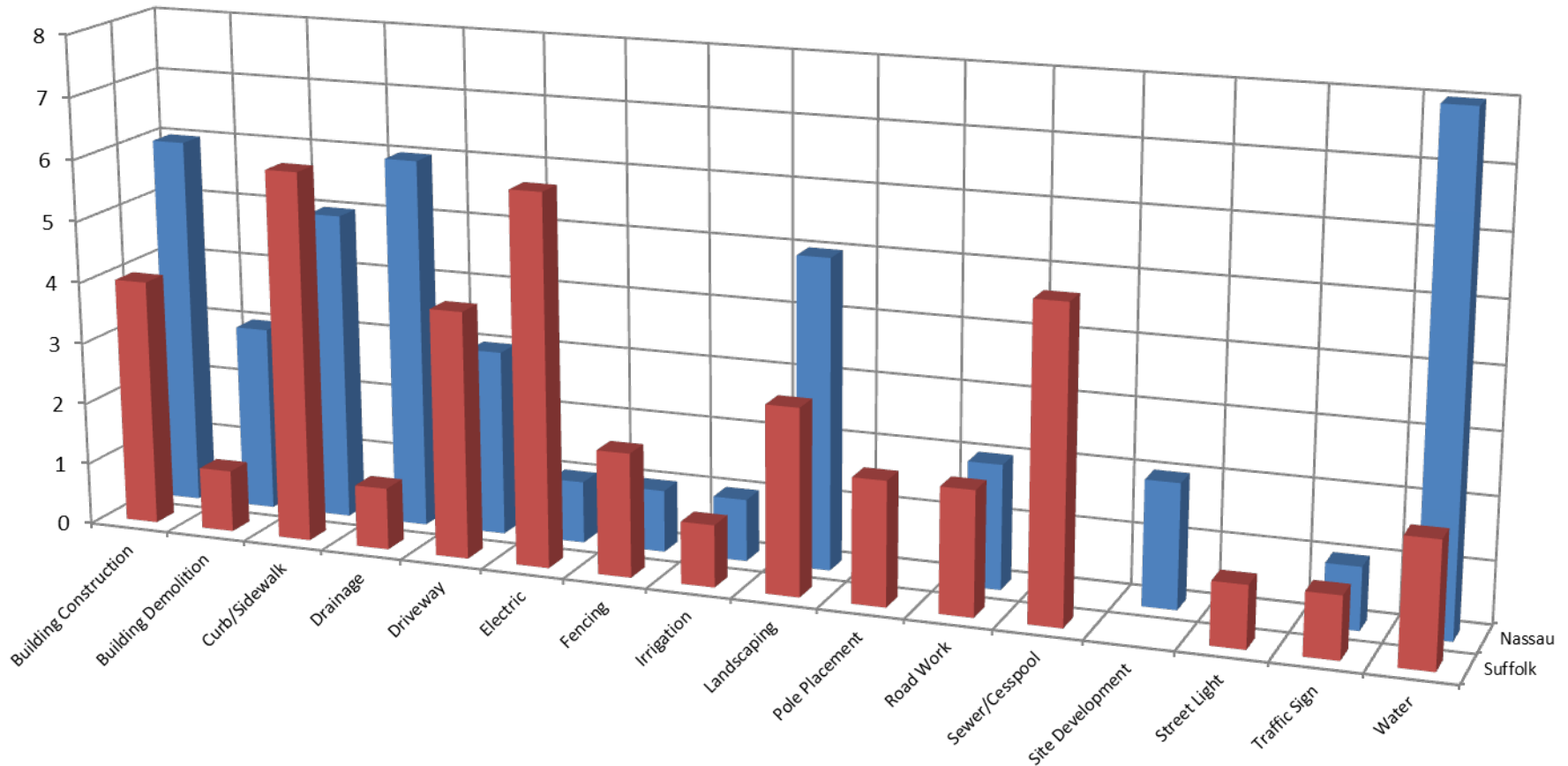


Long Island "No Call" Damages

Type of Work / County

June 2016

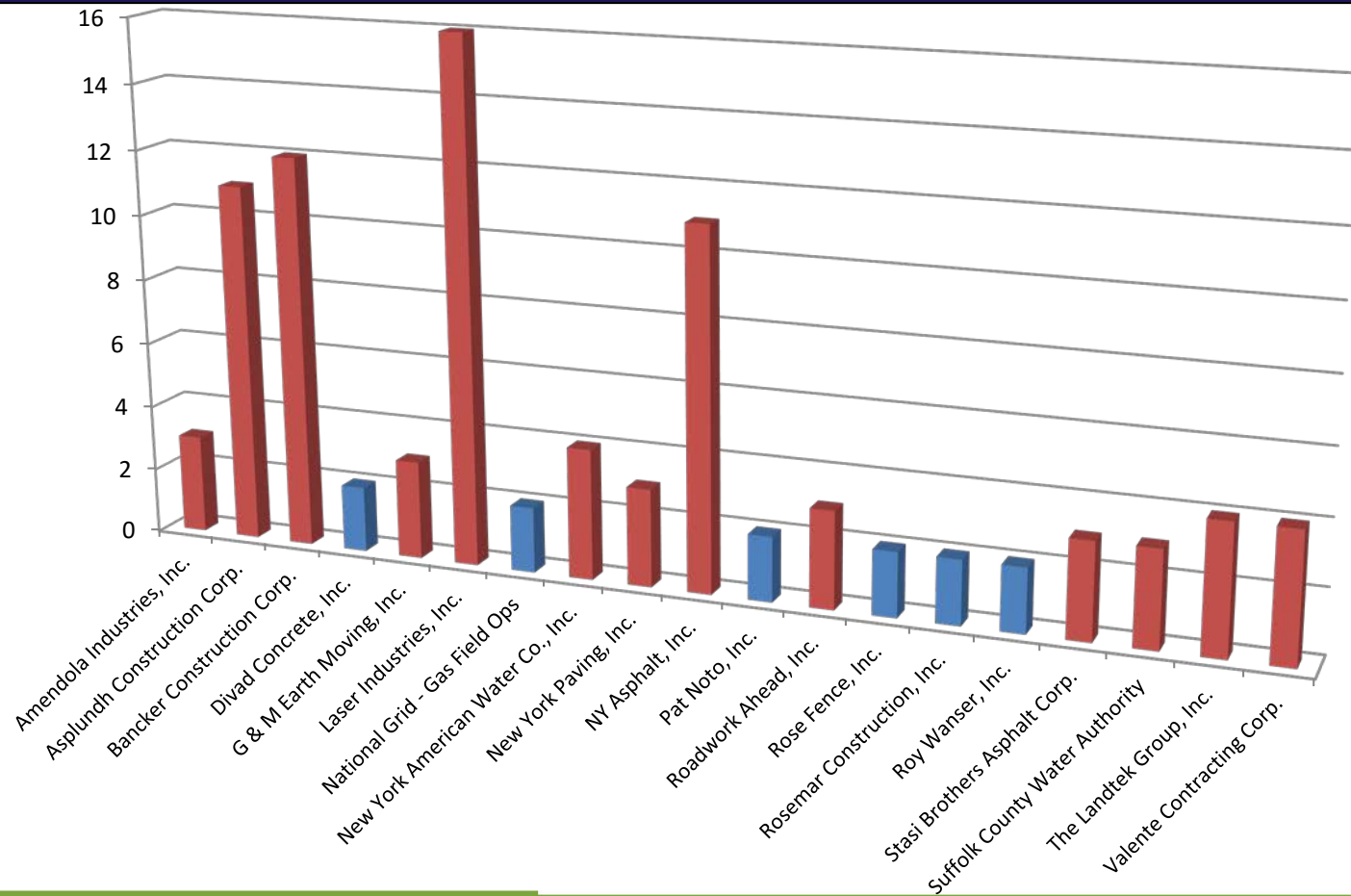
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Long Island "Repeat Offender" Excavator At-Fault Damages

June 2016

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Damage Prevention Initiatives & Partnerships

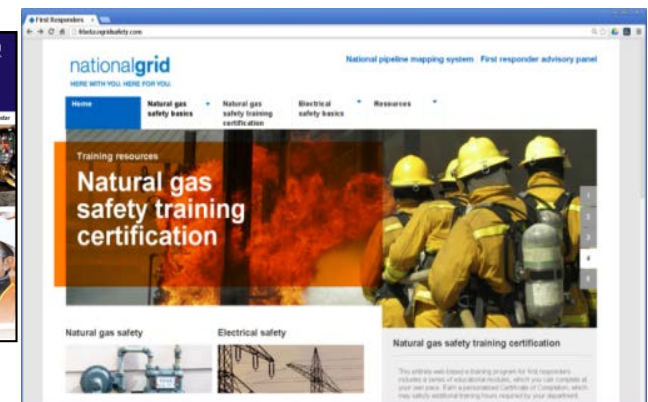
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- Utility
- Locate & Markout Contractor
- Municipality/Regulator
- One Call Centers

Public Safety Awareness

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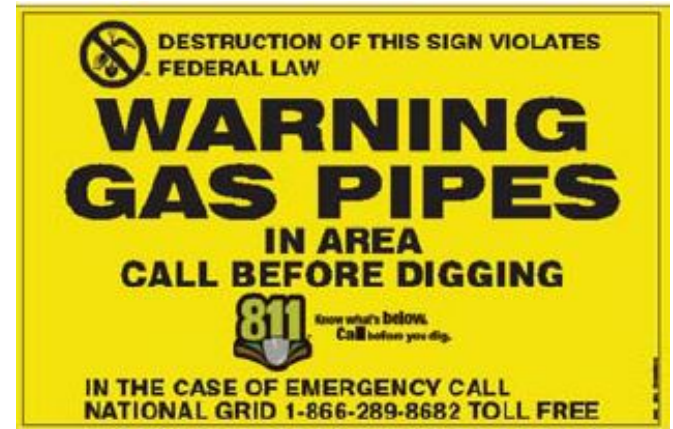
- **Schools**
- **First Responders**
 - E-learning Training system-wide
- **Annual PPAP Mailing**
 - Consumers along the ROW (IMP)
 - Excavators
 - Emergency Officials
 - Public Officials
- **Other Outreach**
 - Cross bore safety - plumbers
 - Carbon Monoxide safety



Damage Prevention Initiatives & Partnerships

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- 3rd Party Watchguard
- Pole Wraps
- 8-day Patrol Cycle
- Ultrasonic Proximity Sensors
- Drones





Damage Prevention Initiatives & Partnerships

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- Damage Prevention Advisor Program
- Ticket Risk Analysis



Damage Prevention Initiatives & Partnerships

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- Municipalities
 - Permit Requirement
- Regulators
 - Investigations
 - Repeat Offenders
 - Enforcement

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Proposed Permit Language for 753 Requirements

The contractor is cautioned to the possible presence of underground utilities in the project area. Under Rules set forth in 16 NYCRR Part 753 (Code Rule 753), the contractor must obtain a full mark-out of underground utility lines by calling 811 at least 2 business days in advance but no more than 10 business days prior to the start of any work. Failure to have a valid and active markout request that covers you every day of your project may void this permit.

Know what's below.
Call before you dig.

Damage Prevention Initiatives & Partnerships

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- Education/Outreach
 - TV, Radio, Seminars
- NY Mets Partnership - 8/11 Day



Damage Prevention Initiatives & Partnerships

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Why the Mets?

- Long Island contractors are:
 - 42% more likely than general public to attend a Mets game
 - 5% more likely than the general public to attend a Yankees game



Why SNY?

- MGH and New York 811 conducted an excavator survey and learned:
 - 85% of respondent contractors said they watch television in the evenings
 - Mets broadcasts are among the top-rated primetime programs in the NY market during the spring/summer for Men 25-54

Damage Prevention Initiatives & Partnerships

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Damage Prevention: A Shared Data Approach

Kevin Hopper, Dig Safely New York, Inc.



www.DigSafelyNewYork.com



Data Silos



www.DigSafelyNewYork.com



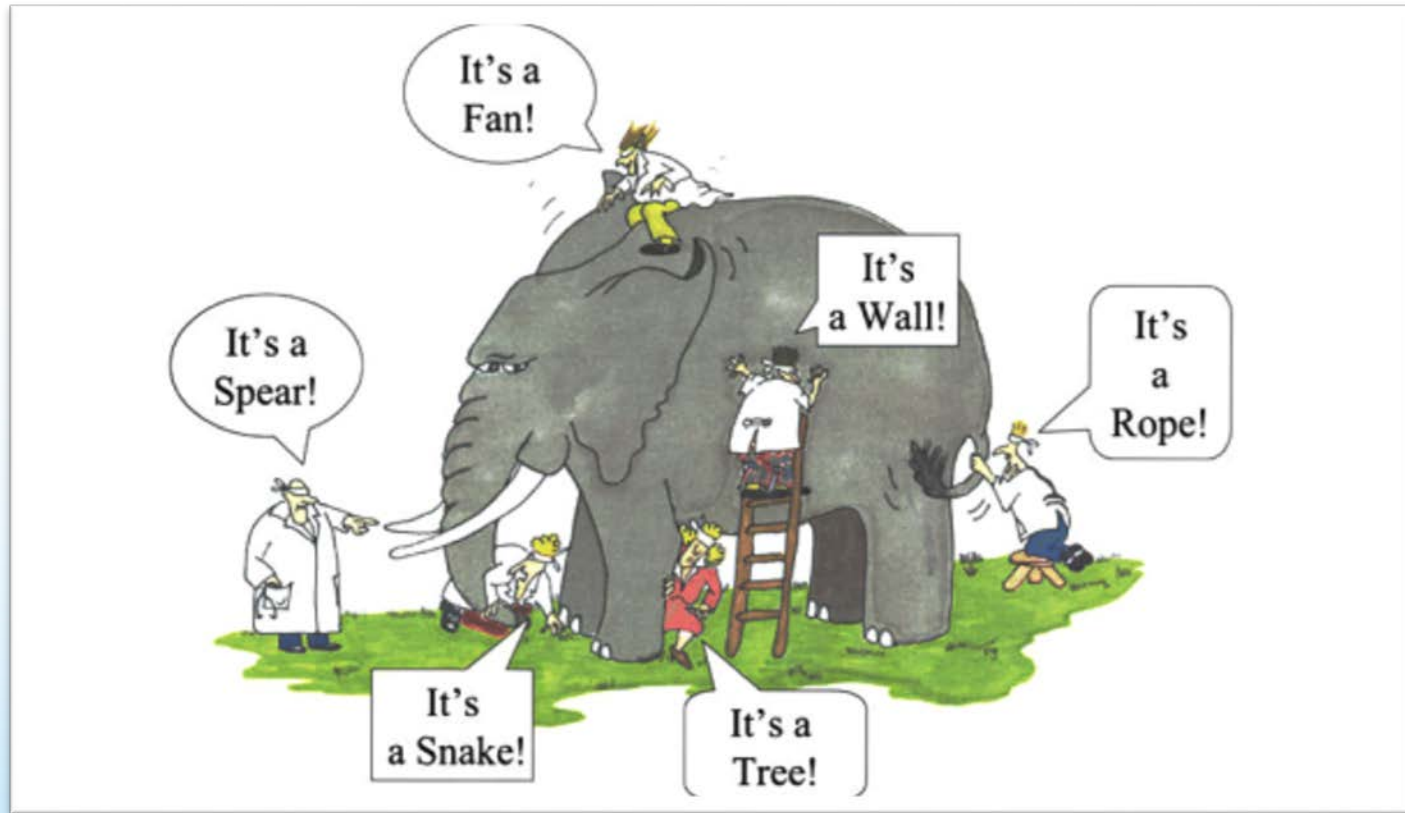
MINE, MINE, MINE



www.DigSafelyNewYork.com



Each Silo Is Only Part of The Story



www.DigSafelyNewYork.com



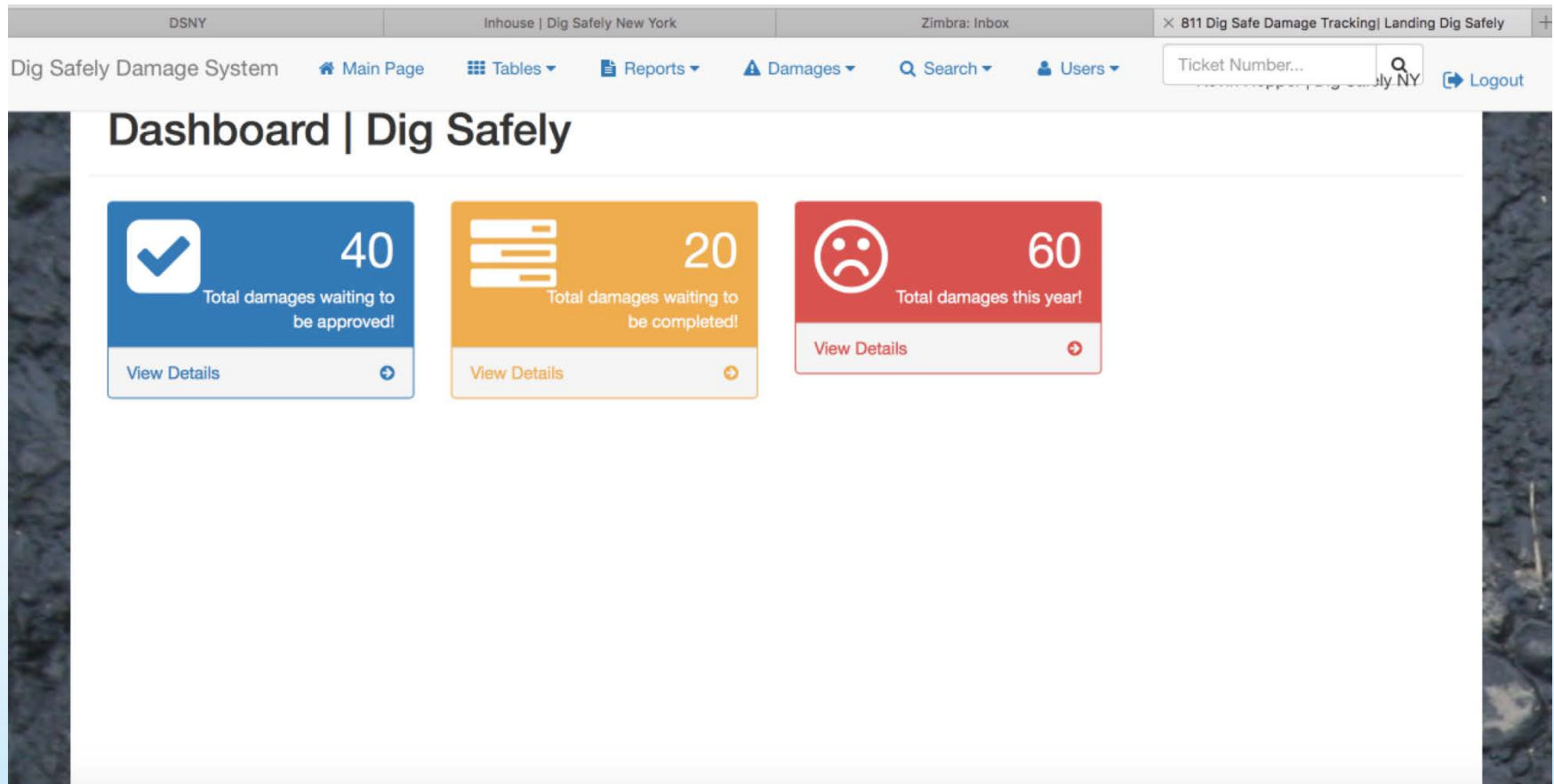
Damage Reporting System



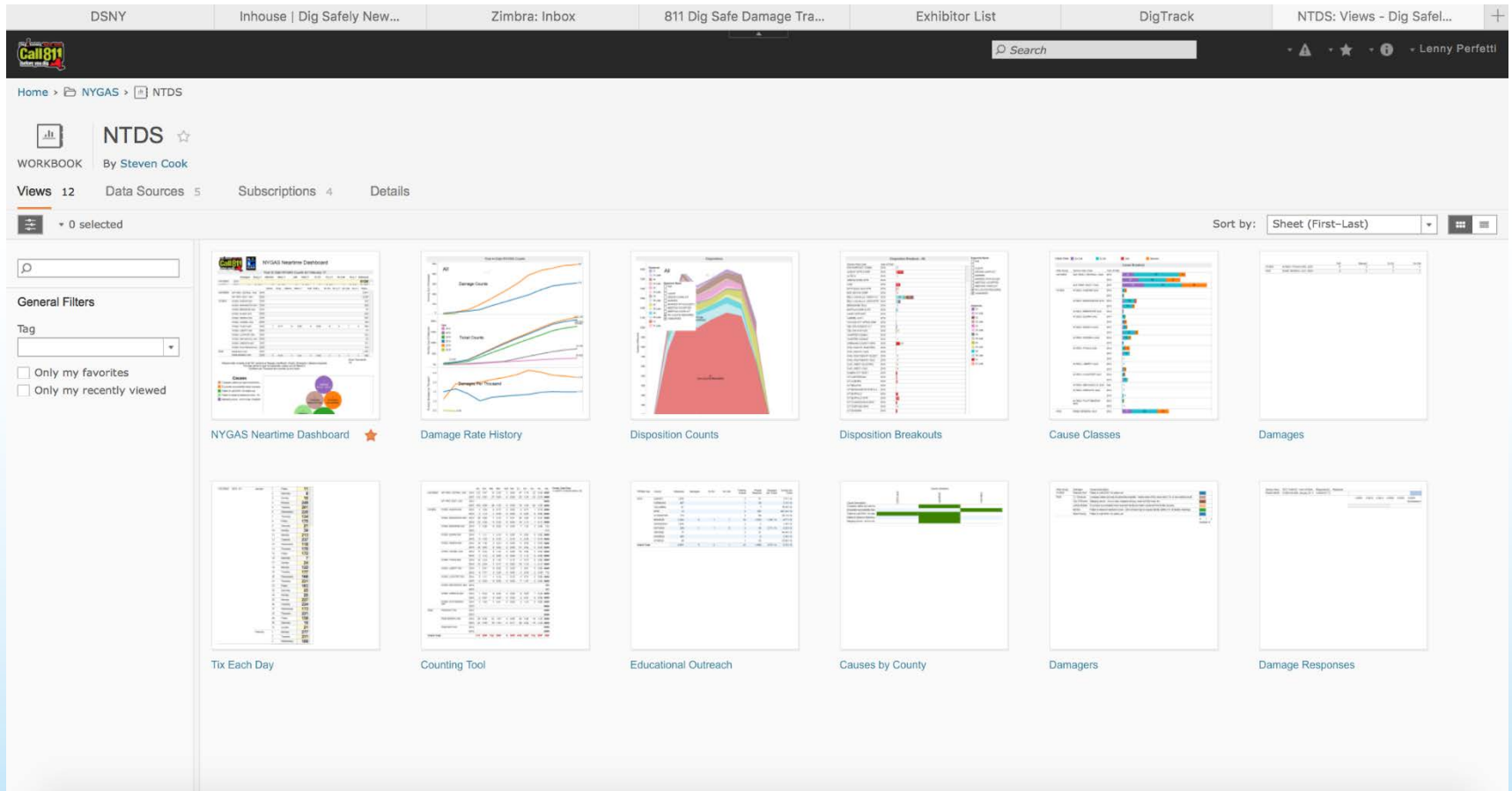
www.DigSafelyNewYork.com



Damage Collection Software



Dig Safely New York Member Portal



www.DigSafelyNewYork.com





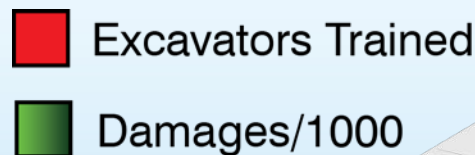
NYGAS Neartime Dashboard

Year to Date NYGAS Counts for July 23.

		Damages	Dmg p T	Mismark	MM p T	Self	Self p T	Ex Err	Err p T	No Call	No p T	Stakeouts	
NYSEG	2016	28	0.91	7	0.23	0	0.00	13	0.42	8	0.26	30725	
			Dama..	Dmg p..	Misma..	MM p T	Self	Self p T	Ex Err	Err p T	No Call	No p T	Stake..
NYSEG	NYSEG / AUBURN GAS	2016	2	0.89	1	0.44	0	0.00	0	0	1	0	2,254
	NYSEG / BINGHAMTON GAS	2016	2	0.35	1	0.17	0	0.00	0	0	1	0	5,761
	NYSEG / BREWSTER GAS	2016											419
	NYSEG / ELMIRA GAS	2016	2	0.50	1	0.25	0	0.00	0	0	1	0	3,963
	NYSEG / GENEVA GAS	2016	9	1.65	0	0.00	0	0.00	7	1	2	0	5,445
	NYSEG / HORNELL GAS	2016	1	0.55	1	0.55	0	0.00	0	0	0	0	1,827
	NYSEG / ITHACA GAS	2016	5	1.27	1	0.25	0	0.00	2	1	2	1	3,930
	NYSEG / LIBERTY GAS	2016											548
	NYSEG / LOCKPORT GAS	2016	5	1.74	1	0.35	0	0.00	4	1	0	0	2,872
	NYSEG / MECHANICVIL GAS	2016	1	5.59	0	0.00	0	0.00	0	0	1	6	179
	NYSEG / ONEONTA GAS	2016											2,218
	NYSEG / PLATTSBURGH GA..	2016	1	0.76	1	0.76	0	0.00	0	0	0	0	1,309

SAFETY TRAINING

Over the last five years excavator training numbers have increased as the number of damages per 1,000 continue to decrease.





GOAL ZERO **DAMAGES**



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NARUC

Summer Committee Meetings

Committee On Gas

**Natural Gas Pipeline Locators -- Safety and Damage
Prevention Power in Cooperation**