

November 2016



Natural Gas Utilities

Research and Development Opportunities





The American Gas Association, founded in 1918, represents more than 200 local energy companies that deliver clean natural gas throughout the United States.



Enhancing Safety: A Joint Effort

AGA and its members are dedicated to the continued enhancement of pipeline safety. Safety is a joint effort, a partnership that engages customers, regulators and policymakers at every level. We are committed to proactively collaborating with federal and state regulators, public officials, emergency responders, excavators, consumers, safety advocates and the public to continue improving the industry's longstanding record of providing natural gas service safely and effectively to more than 177 million Americans.



Transmission

AGA membership represents 57.4 % of the nation's intrastate transmission pipelines.

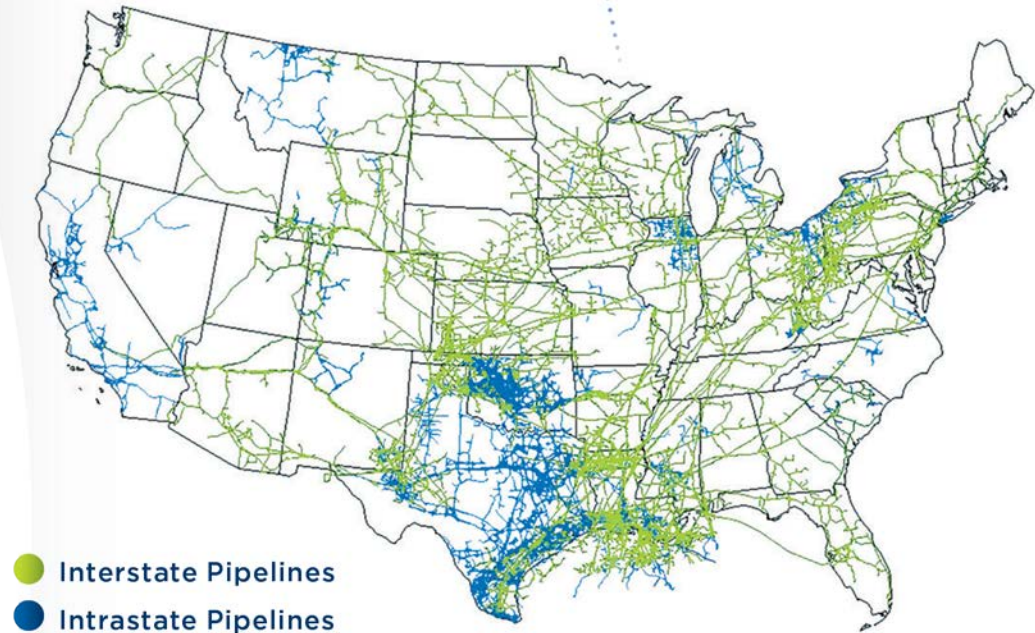
Each pipeline is unique to its accompanying infrastructure.

105,821

Miles of Intrastate

191,033

Miles of Interstate



Intrastate Transmission

Opportunities:

Hydro testing of in-service pipelines

Constraints with single feeds

Material Verification of Existing Pipelines

Verifying the material characteristics of existing pipelines without removing coupons or taking a line out of service.

Traceable

Verifiable

Complete



Challenges for In Line Inspection (ILI) of Pipelines

Opportunities:

- Placement and design of launching and receiving stations
- Extending the inspection range for robots used in non-ILI able pipelines.
- Improved ILI assessment techniques – effective weld and long seam assessment and ability to detect and characterize cracks accurately.



Damage Prevention

Opportunity for location of plastic mains and services:

- Alternatives to tracer wire
- GPS tracking technology
- Pipeline status of active or non-active



Leading cause of serious incidents

Excavation Damage

Approximately 2.2 million miles of distribution and service lines in the U.S.



Continue the Declining Trend of Natural Gas Emissions

Opportunities:

Cost effective methods for avoiding or reducing
blow-downs

More accurate and cost efficient field
measurement for emission rates

M&Rs in underground vaults

Gathering lines



*Washington State University
conducted a nationwide field
study in 2015 that found that as
little as 0.1% of the natural gas
delivered nationwide is emitted
from local distribution systems.*



UNDERGROUND STORAGE

Opportunities:

- Tools for leak detection, logging, integrity management
- Risk assessment and risk management

Past research has focused on integrity & safety, operational efficiencies, and reliability



+18%

MORE STORAGE
CAPACITY THAN
2002-2003



Vaughn W Shosted

**Vice President, Operations
Questar Gas Company**