

# Memorandum



DATE: April 13, 2018

TO: Honorable Mayor and Members of the City Council

SUBJECT: **Atmos Energy Update**

On Wednesday, April 18, 2018 you will be briefed on the Atmos Energy Update. Atmos Energy is scheduled to discuss the planned outage in Northwest Dallas, system modernization, customer service and billing, and their ongoing commitment to safety and communication.

Attending will be Mike Haefner, President and CEO, David Park, Senior VP of Utility Operations, John Paris, President of the Mid-Tex Division, Chris Felan, VP of Rates and Regulatory, and Liz Beauchamp, VP of Government and Public Affairs.

The memorandum from Atmos is attached for your review.

Please contact me if you have any questions or need additional information.



Jon Fortune  
Assistant City Manager

[Attachment]

Cc: A.C. Gonzalez, City Manager  
Christopher D. Bowers, (I) City Attorney  
Craig D. Kinton, City Auditor  
Rosa A. Rios, City Secretary  
Daniel F. Solis, Administrative Judge  
Ryan S. Evans, First Assistant City Manager  
Eric D. Campbell, Assistant City Manager

Jill A. Jordan, P.E., Assistant City Manager  
Mark McDaniel, Assistant City Manager  
Joey Zapata, Assistant City Manager  
Jeanne Chipperfield, Chief Financial Officer  
Sana Syed, Public Information Officer  
Elsa Cantu, Assistant to the City Manager – Mayor & Council

# Memorandum

DATE April 18, 2018

TO Honorable Members of the Dallas City Council

SUBJECT **Atmos Energy Update**

On April 18, 2018 Atmos Energy will brief the council on the planned outage, investments in our infrastructure, our ongoing commitment to safety, our communication efforts and customer service and billing. Attending will be Mike Haefner, President and CEO, David Park, Senior VP of Utility Operations, John Paris, President of the Mid-Tex Division, Chris Felan, VP of Rates and Regulatory, and Liz Beauchamp, VP of Government and Public Affairs.

## Planned Outage in Northwest Dallas

On March 1, Atmos Energy initiated a historical planned outage of its natural gas distribution system. In the days leading up to March 1, we began observing sudden and unexplainable system performance that was unprecedented in our company's history. We were unable to explain system performance given our prior maintenance and operating experience with this system. We hired a Geotechnical and Forensic Services firm to understand the potential cause. The preliminary finding of the firm indicated that an extraordinary confluence of events, in a limited geographic area, damaged our pipeline system in that area. There is no evidence this unprecedented combination of conditions exists elsewhere in our system or could have been readily modeled, predicted, anticipated, or foreseen. The preliminary report is attached.

The safety of the public, our customers, employees, and system is our highest priority and we took immediate and decisive action to shut down the system which affected approximately 2,800 residences, 2,435 of whom are Atmos Energy customers. We promptly began replacing every main, service line, and meter in the planned outage area. Atmos Energy employees and contract crews completed a replacement project that would normally take 12 months in three weeks.

We knew this would be disruptive and inconvenient to our customers. We began immediately working with the City Manager's office and the Office of Emergency Management. Within minutes of learning about the planned outage, the OEM activated the EOC and we began working on plans to take care of the affected residents.

- Atmos Energy established two information centers open seven days a week to assist with lodging needs or monetary assistance. This effort was closely coordinated with the City of Dallas, OEM, Dallas County, the American Red Cross, and other local, county and state officials.
  1. To date, more than \$15 million in monetary assistance has been provided to approximately 2,400 customers.
  2. Plumbing assistance was provided to approximately 1005 of the residents.
- Within 24 hours we created our Command Center in the affected area. Functioning like a typical service center during the outage, it became the largest service center in Atmos Energy.

1. The Command Center operated 24-hours a day, seven days a week with hundreds of employees and 120 contract crews until the replacement project was completed.
2. More than 40 contract plumbing crews from across the metroplex and also Waco, were onsite to make plumbing repairs.
3. Created a dedicated website for information, dedicated 24 hour hotline, and interactive real-time map showing progress for customers.

### **System Modernization**

Our vision is to be the safest provider of natural gas services. To that end, we remain vigilant in our focus as a company on:

- Public, Employee and System Safety
  - Following industry accepted operating practices
  - And Federal and State Regulations
- Close Monitoring and system maintenance
- 24/7 hotline for customer's to call if they smell natural gas
- Pipe replacement
- Steel service line replacement
- New and improved technology
- Public Awareness and Customer and Community Education
- State-of-the-art training

Atmos Energy's natural gas distribution lines, which were installed over many decades, are made of various materials. The most common types are protected steel and polyethylene plastic. We also have pipelines made of cast iron, bare steel, and vintage plastic.

Our modernization program along with federal and state rules and regulations guide the prioritization of pipeline infrastructure selected for monitoring or replacement every year. In 2011, the Texas Railroad Commission adopted a comprehensive pipeline safety rule that required all Texas natural gas distribution companies to develop risk-based prioritization programs to model and determine the relative risks of pipe in their system and then develop a prioritized process for replacement. Companies are required to report annually their pipe replacement activities under this rule and their plans for the following year.

Our risk based prioritization model takes many factors into consideration, including, maintenance history, age, material, construction methods, and other factors. Using what we learned from the geotechnical experts, we are working to incorporate these new findings into our risk based prioritization models. We will then adjust the prioritization of replacement projects and system monitoring accordingly and as a result our future pipe replacement in the City of Dallas. This is consistent with prior operating practice and required by federal and state regulations.

The risk based approach guides our work. For any segment of pipe that is identified as being highest relative risk, the pipe is either scheduled for replacement or accelerated action is taken by scheduling it to be leak surveyed more frequently. Each year, we reassess the performance of our system and re-prioritize our work based on that performance.

Greater than 80% of our investments are directed at pipe replacement, as well as other system modernization and safety and reliability needs.

Since 2011 in Texas, we have:

- Replaced 1,700 miles of distribution pipe including 300 miles of cast iron
- Replaced approximately 195,000 steel service lines
- Lowered excavation damage per 1,000 line locates by 36%

### **Ongoing Commitment to Safety**

Our vision is for Atmos Energy to be the safest provider of natural gas services. We intend to achieve this vision by: operating our business exceptionally well, providing excellent customer service, investing in our people, infrastructure and culture.

Our system is safe and we remain vigilant in our commitment to safely maintaining and operating our natural gas system.

Pipeline leaks are a primary safety focus of all natural gas utilities, with extensive precautions taken to prevent, detect and eliminate them. When we identify a hazardous leak on our system, we take immediate action to eliminate the hazard and replace the pipe segment.

We perform leak surveys on all our pipelines at time intervals that meet or exceed state and federal regulations. We adhere to state mandated leak grading and repair criteria.

We monitor and review technology throughout the industry and implement proven technologies where appropriate. Our leak survey technicians now have Remote Methane Leak Detectors (RMLDs) that use lasers to detect and pinpoint the presence of natural gas.

We have made significant investments in state-of-the-art mobile leak detection technology that uses innovative gas-analysis instruments which are approximately 1,000 times more sensitive than traditional leak detection equipment.

We will continue to embrace new technologies that allow us to run our systems even more safely.

The overwhelming majority of significant natural gas leaks are the result of damage to our lines by third parties that fail to call before they dig or respect the markings of our pipe in violation of federal and state law and Railroad Commission regulations.

We routinely promote the Texas One Call system at the FCC-mandated number of 811 or the Texas Once Call number of 1-800-545-6005.

### **Commitment to Communication**

Atmos Energy employees work closely with numerous departments and organizations within the City of Dallas on a regular basis to coordinate repair and replacement projects throughout the entire city.

We consistently work with local, state and federal regulators and are in constant communication regarding various intricacies of our work throughout the city and state. We regularly have over 100 safety compliance auditors on the Mid-Tex system every year.

We have added industry reports, such as our distribution leak data, work plans as required by the Railroad Commission of Texas, our Mid-Tex division distribution facilities replacement completion reports as well as our annual rate filings to our website.

We have a comprehensive Investing in Safety Communication Strategy that we use to educate and inform our residents of all planned pipe replacements in their neighborhood that includes door hangers, letters, signs and various other tools to explain the process.

### **Customer Service and Billing**

Estimating bills is a common practice among most utility companies. Our customer service system's technology has the capability to estimate our customer's bills by comparing the current read to the prior usage history.

In Texas, the rules of service, estimated bills. Atmos Energy's practice is not to estimate two consecutive months. The bill will reflect whether it is "Actual Usage" or "Estimated Usage". This is not a seasonal practice, but one we utilize year round.

Estimated reading is one of the many ways that we can help keep the customer's bill low by minimizing the labor associated with reading meters. There is never a month that all of our customer's bills in Dallas are estimated.

Estimated readings can be higher or lower than actual usage. However, bills self-correct when the meter is read, ensuring a customer never pays for more natural gas than actually used. If the bill is estimated higher than actual usage, we apply the difference to the next bill as a credit. We are happy to give a refund if a customer requests.

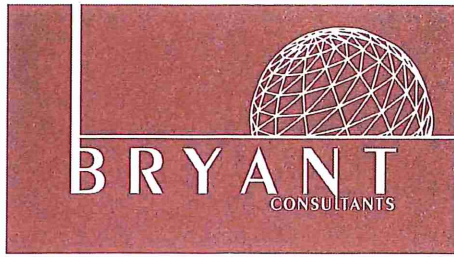
We offer several ways for customers to manage their household budget and avoiding winter surprises to their natural gas bill. One way is through Budget Billing. Budget Billing is based on a rolling, 12-month average of their bill and adjusts each month. It provides customers with a more predictable amount due every month. Each month the bill will state the current month's charges and the monthly budget amount due. The bill will also include the total budget balance- which is the balance of total charges and payments.

This winter, due to record setting temperatures across Texas in January and February, Atmos Energy customers saw an increase in their natural gas consumption. According to the U.S. Energy Information Administration, on New Year's Day more natural gas was consumed than any other day in history. Atmos Energy experienced record demand on our natural gas distribution system. In January, we had 36% more natural gas delivered on our system compared to last year.

As a reminder, by law we do not mark up the cost of natural gas. Our customers pay what we pay to purchase natural gas. Natural gas consumption represents the largest portion of a customer's winter bill - on average two-thirds of an overall bill.

Closing Remarks

Thank you for allowing us to visit with you today about the safety of our natural gas system, the past and future investments into our system and our ongoing commitment to operate a safe and reliable system.



3360 Wiley Post Road • Suite 100 • Carrollton, TX 75006  
Tel: (972) 713-9109 • Fax: (972) 713-9171  
[www.geoneering.com](http://www.geoneering.com)

Preliminary Assessment Report  
February 28, 2018

Bryant Consultants, Inc. (BCI) was retained by Atmos Energy due to the sudden and unexplained leaks concentrated in a narrowly defined area approximately three thousand feet to the east and west of Marsh Lane and within the boundaries of Walnut Hill Lane to the north and W. Northwest Highway to the south, to identify a potential cause for the leaks and assist in developing a response. This letter report summarizes our preliminary assessment.

The area where the leaks occurred is where variable geological formations are in close proximity. More specifically, the defined area represents the meeting point of an “Eagle Ford Shale” formation, the Quaternary “Alluvium” and the “Austin Chalk” formation. Each of these formations have different soil properties and swell characteristics.

The Austin Chalk and Eagle Ford formations have high soil swell potentials, with the Eagle Ford Shale’s expansive potential being much higher than that of the Austin Chalk. The area may also have a thin layer of Quaternary terrace deposits at the surface that masks the contact between the two formations. The difference in expansive potential between the underlying potentially highly expansive soils can cause substantial differential soil movements. The close proximity of these two formations creates a geological “hinge-point” where the land generally to the west of Marsh Lane may move more relative to the land to the east of Marsh Lane where more uniform and stable soil and moisture conditions are generally encountered. The recent extended period of rain has likely exacerbated this movement. Further, the hydrogeological conditions allowing moisture migration near the contact of these two formations also is a likely causative factor. This differential movement exacerbated by the rainfall infiltration and groundwater migration over this recent period led to forces that caused unanticipated external loadings on the piping within this system. Due to the juxtaposition of the geological contact, soil conditions, the magnitude and migration of rain fall, infiltration, run-off and sub-surface water seepage and flow, and the system characteristics, it is our opinion based upon the evidence available at this time that the longitudinal forces that were added to the system could not have been readily modeled, predicted, anticipated, or foreseen.

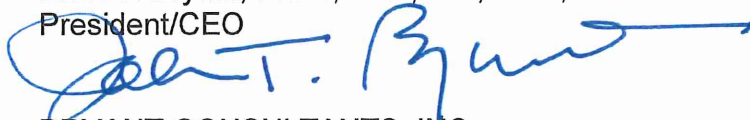
February 28, 2018  
Preliminary Assessment Report  
Page 2 of 2

Further, because these areas were saturated, these saturated soil and pooling water could potentially mask these failures for a period of time by holding the gas in place and preventing detection. As the area continues to dry, the moisture dissipates and the gas is allowed to migrate to the surface, making the gas easier to detect, and leading to the increased detection of leaks recently, after the rain event.

While there is still more work to do to confirm this theoretical model, this is the most realistic causal mechanism based upon the evidence reviewed to date. Based on the available evidence, there is no second-best theory at this time.

Sincerely,

John T. Bryant, Ph.D., P.G., P.E, CPG, D.GE  
President/CEO



BRYANT CONSULTANTS, INC.  
TX. Firm Registration No. F-844



**JOHN T. BRYANT, Ph.D., P.G., P.E., CPG, D.GE, M. ASCE**

**3360 Wiley Post Road, Suite 100**

**Carrollton, Texas 75006**

**Phone: (972) 713-9109**

**Fax: (972) 713-9171**



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## **CURRICULUM VITAE**

### **EDUCATION**

Doctor of Philosophy (Ph.D.), Civil Engineering (Geotechnical/Constructed Facilities Group), Texas A&M University, 1991

Master of Science, Geography (Geomorphology), Texas A&M University, 1987

Bachelor of Science, Engineering Geology, Texas A&M University, 1985

Bachelor of Science, Civil Engineering (BSCE), Texas A&M University, 1991

Associate in Science, Engineering, New Mexico Junior College, 1983

### **PROFESSIONAL REGISTRATION**

#### **Engineering**

Registered & Licensed Professional Engineer:

Texas, No. 80163

New Mexico, No. 18085

Louisiana, No. 33537

North Carolina, No. 034508

Arizona, No. 49063

Colorado, No. 42859

Arkansas, No. 14097

Tennessee, No. 113028

Utah, No. 8084186-2202

Florida, No. 73600

Oklahoma, No. 25878

New York, No. 092109.1

New Jersey, No. 24GE05123300

South Carolina, No. 33044

Virginia, No. 0402056235

Georgia, No. PE040925

#### Geology/Geoscience

Licensed Professional Geoscientist (Texas), No. 284

Licensed Professional Geoscientist (Tennessee), No. 2555

Licensed Professional Geologist (Mississippi), No. 0797

Licensed Professional Geologist (Kansas), No. 803

Licensed Professional Geologist (Kentucky), No. RPGGEO00218444

#### Professional Organizations

American Institute of Professional Geologists, Certified Professional Geologist, CPG-9926

American Society of Civil Engineers, Member No. 315125

Post-Tensioning Institute, Member No.

American Council of Engineering Companies, Member No.

#### **COMMITTEE MEMBERSHIP**

Committee Member, National Research Council, Transportation Research Board (TRB),  
Transportation Research Committee on Engineering Behavior of Unsaturated Soils.

Past Chairman, present Committee Member, Post Tensioning Institute's Slab-on-Ground Committee.

Committee Member, Texas American Society of Civil Engineers (ASCE), Residential Foundation  
Evaluation and Repair Subcommittee.

Committee Member, American Society of Civil Engineers (ASCE), Technical Council on Forensic  
Engineering, Committee on Forensic Practices.

Committee Member, American Society of Civil Engineers (ASCE), Geo-Institute, Design of  
Residential Structures on Expansive Soils.

## PROFESSIONAL EMPLOYMENT

Adjunct Professor of Geology and Geophysics at Texas A&M University, College Station, Texas, Spring 2016 to Present

Bryant Consultants, Inc. - September 1996 to Present

Bryant Consultants, Inc. was formed in September 1996 to provide consulting forensic geotechnical and geo-structural consulting, as well as consulting for site development for builders, developers and owners to mitigate problems associated with construction. Geographic Information Systems and computer modeling are used in conjunction with over 14 years of consulting expertise to provide innovative solutions to site development and construction related distress problems.

As president of Bryant Consultants, Inc., Dr. Bryant is the principal in charge of all engineering operations including forensic, geotechnical, geo-structural and geophysical modeling and testing. Dr. Bryant coordinates the operations of the company with other affiliated technical experts when required. Dr. Bryant has provided expert witness testimony in over 100 various mediations, arbitrations and court cases over the past 14 years.

Bryant Consultants, Inc. has performed work across Texas including Dallas, Houston, Austin, and San Antonio. BCI has also performed work in other states such as Oklahoma, New Mexico, New Jersey, Arizona, Mississippi, North Carolina, Florida, Arkansas, Louisiana, Colorado and Kansas. Bryant Consultants, Inc. provides a unique combination of geotechnical expertise coupled with geophysical exploration technology to provide the most accurate two and three-dimensional representation of subsurface conditions available.

Dr. Bryant has performed work at the world's largest earthwork project located at the Lakes of Arlington in Arlington, Texas, Texas A&M Bonfire Collapse and has also worked on individual house failures such as the dramatic slope failures shown in the news in Trophy Club, Texas and at Lake Whitney, Texas. Dr. Bryant has also evaluated other subterranean as well as mine collapses in Kansas and Louisiana, as well as tunnel collapse and geological issues.

Dr. Bryant's specialties include, but are not necessarily limited to the following areas:

- \*Evaluation of Soil-Structure Interaction including Pavements, Foundation Analysis and Design, Retaining Wall Design and Analysis, Slope Stability and Soil Dynamics.
- \*Geotechnical Engineering and Design
- \*Vibration Testing, Analysis and Evaluation
- \*Pavement Design and Analysis
- \*Geophysical Modeling including Seismic, Electrical and Radar.
- \*Geological Modeling Analysis
- \*Fault Studies including HGS Phase I and Phase II Investigations
- \*Geomorphological Modeling
- \*Numerical Modeling of Soil-Structure Interaction and Geo-structural Elements.
- \*Construction Materials Evaluation and Analysis
- \*Groundwater Modeling
- \*Specialist Geotechnical Laboratory Testing including Soil Suction and Triaxial Testing
- \*Research and Development
- \*Supervision and personal experience (field and laboratory) in construction material testing and observations including, but not necessarily limited to: 1) earthwork placement, 2) concrete and

asphalt pavement placement, 3) drilled shaft construction, 4) compressive cylinder testing, 5) Proctor moisture and density curve derivation, and 6) placement of reinforcement in piers and concrete including pavements.

#### PE Consultants/Dallas January 1996 to September 1996

PE Consultants/Dallas was founded in January 1996 to provide better service for clients and customers after leaving Maxim Technologies, Inc. PE Consultants performed work on approximately 60 projects across the state including projects in Rockwall (Wal-Mart), Houston, Wichita Falls, Brownwood, and the DFW Metroplex. PE Consultants/Dallas provided geotechnical engineering, geophysical testing and consulting, construction materials engineering and testing, as well as environmental consulting services to a diversified client base. The projects ranged in complexity from analysis of landslide stability, providing design parameters for small residential construction and large industrial sites and forensic engineering to assess the distress conditions at residences and other structures.

Dr. Bryant helped in design of several post-tensioned slab-on-grade foundations for three story hotel structures and for individual residences using the VOLFLO and PTISLAB design programs. He also performed structural inspections at numerous residences across the DFW Metroplex to evaluate the distress patterns at these structures and to develop possible causes for the distress condition.

Dr. Bryant has worked closely with Dr. Robert L. Lytton, P.E., on several interesting projects using the total soil suction and matric soil suction test methods to evaluate the PTI slab design parameters. Over the past few years, several thousand total and matric soil suction tests have been performed under his supervision. These tests have been used to estimate the actual movement magnitudes to develop slab-on-grade design parameters for each site.

#### Maxim Engineers/Technologies, Inc. July 1994 to January 1996

Dr. Bryant's duties at Maxim Engineers, Inc. included coordination of the geotechnical laboratory, geotechnical drilling and geotechnical engineering activities. Dr. Bryant also worked closely with the Construction Materials Testing and Environmental Consulting parts of the organization when projects required construction monitoring and Environmental Site Assessments. During his tenure with Maxim Engineers, Inc. as the Manager of Geotechnical Engineering, he worked on a number of interesting geotechnical projects across the State of Texas. A partial list of these projects includes:

1. MedCath Heart Institute, McAllen, Texas. Performed geotechnical engineering and analysis for a two story medical facility. This project was challenging because of the various field testing problems encountered and the large structural loads imposed.
2. Pavestone Plant, Katy, Texas. Performed geotechnical engineering and analysis for a sensitive car/truck block retrieval system for storage of Pavestones' wall and paver products. The challenge on this project was to provide safe, but not over-conservative design parameters and recommendations for tolerances of movement of less than 0.25 inches.
3. Omnimax Theater, Dallas, Texas. Performed geotechnical engineering and analysis for a multi-level theater/museum complex at Fair Park.

4. Various remedial forensic geotechnical and geological investigations. The challenge in these projects is to develop "why" structures are experiencing distress and to work with the structural engineer to develop solutions to the problem soil conditions.

Dr. Bryant was also involved in research at Maxim Engineers, Inc. to test various chemical additives on the highly expansive clay soils in the Dallas/Fort Worth Metroplex Area. Other research activities include modeling movement magnitudes using soil suction, theoretical diffusion models and standard empirical models.

Southwestern Laboratories, Inc., July 1991 to July 1994

During Dr. Bryant's tenure at Southwestern Laboratories his duties as a staff and project engineer included: 1) designing shallow and deep foundation systems for large buildings to individual houses, 2) forensic investigations of foundation failure, 3) field and design work for pipeline, tunneling and light rail projects for the City of Farmers Branch and Dallas Area Rapid Transit (DART), 4) use of laterally loaded shaft and slope stability programs to determine safe construction and final slope designs, and 5) use of electrical resistivity to identify leachate migration from municipal landfills, to locate gravel and sand deposits and for the grounding of transmission towers.

Dr. Bryant's geotechnical experience involved using several different computer programs for analysis of slope stability (UTEXAS2), lateral load capacity and deflection (COM624G), and settlement predictions (SETANL). Dr. Bryant also wrote several computer programs including GeoPVR based on the TxDOT's 124-E procedure and Fredlund's Method using interactive methods. The TxDOT's method is based on McDowell's empirical correlations. Another program, BearSet allows calculation of bearing values for shallow foundations, as well as settlement using Schmertmann's method in sand or classical Terzaghi consolidation theory in clay for NC or OC clays.

Dr. Bryant's field experience with Southwestern Laboratories included geological mapping and surveying using a transit and brunton compass, as well as construction observation of drilled shafts, retaining walls, and water injection of slab-on-grade pads. While working on the Farmers Branch (5' diameter) and DART (20' diameter) tunnel projects, he supervised drilling of approximately 100 borings, both oriented and vertical, ranging in depths from 30 feet to over 200 feet. Dr. Bryant's field responsibilities included visually logging all core samples and recording shear, joint and fault orientations, as well as identifying subtle stratigraphic variations. Dr. Bryant observed and supervised the installation of approximately 100 piezometers and monitor wells during his tenure at SwL.

Further, Dr. Bryant was responsible for conducting single and double packer pressure tests used to establish the formation's hydraulic conductivity or coefficient of permeability. Finally, Dr. Bryant's field experience included constructing and setting various piezometers for the tunnel projects and conducting California Bearing Ratio tests for pavement evaluation and design.

Dr. Bryant also used geophysical methods including electromagnetics (EM) resistivity, gravity and seismic methods to identify landfill volumes, depths and fill composition. In one study, he mapped a 10-acre tract using resistivity, EM and borings, and located construction debris including steel drums and concrete rubble.

Calvin E. Woods, Ph.D., P.E., R.P.L.S., an engineering consultant, June 1989 to June 1991

1) Prepared preliminary (Phase I) environmental site assessment for a site near San Antonio, Texas. Took soil samples and analyzed and synthesized geologic and soils information and maps. Prepared a report based on the laboratory information and geology and soils data.

2) Prepared hydrological and geological reports including flood routing and ditch sizings for expected peak flood rainfall events for landfill cap at Texas Municipal Power Authority (TMPA) lignite mine near Carlos, Texas.

K. W. Brown and Associates an environmental consulting firm, March 1990 to June 1990

Worked part-time on a post-closure permit application for a hazardous waste site at a General Electric plant in Pennsylvania. Prepared maps and coordinated computer-aided design draftsmen.

Texas A&M University, January 1986 to May 1991

Teaching Assistant/Part-Time Instructor, Texas A&M University, Department of Civil Engineering, Geotechnical Engineering Class, January 1991 to May 1991.

Research Assistant, Texas A&M University, Department of Civil Engineering, Fall 1988 to December 1990.

Graduate Teaching Assistant, Texas A&M University, Department of Civil Engineering, Spring 1988. Teaching assistant for CVEN 365, Geotechnical Engineering class.

Graduate Teaching Assistant, Texas A&M University, Department of Geography, Fall 1987. Teaching assistant for GEOG 213, Physical Geography Lab.

Graduate Teaching Assistant, Texas A&M University, Department of Geography, Spring 1987. Teaching assistant for GEOG 380, Environmental Workshop class.

Graduate Teaching Assistant, Texas A&M University, Department of Geography, Fall 1986. Teaching assistant for GEOG 431, Geomorphology class and GEOG 689, Coastal Geomorphology class.

Graduate Teaching Assistant, Texas A&M University, Department of Geography, Spring 1986. Teaching assistant for GEOG 430, Cartography. Also constructed and compiled a general-use map for a ranch in West Texas.

## RESEARCH EXPERIENCE

### Geomorphologic Research

1. Analysis of coastal landforms and coastal morphodynamics. Galveston Island and Bolivar Peninsula, Texas. January 1986 to December 1987.
2. Analysis of sediment surrounding Hohokam Indian settlement sites in South Central Arizona by dry-sieving methods, Spring 1987.
3. Construction of engineering geomorphologic map of Wolf Pen Creek, College Station, Texas, Spring 1987. The work involved use of transit for accurate placement of markers to determine slope angles and erosion rates in the area.

### Civil Engineering/Geophysical Research

1. Research using a scale-model test tank and forward computer models involving cross-borehole and surface-to-borehole electrode configurations to locate subsurface conductive/resistive anomalies and to characterize the two-dimensional sub-surface resistivity structure.
2. Installation and monitoring of slope indicator and pressure sensor devices, as well as strain gages, for a retaining wall adjacent to a new road embankment near Houston, Texas for the Texas Department of Transportation.
3. Evaluation of heave mechanisms in expansive clay soils including computer simulation of various prediction schemes.
4. Correlation of soil suction values to other physical and engineering soil properties.
5. Development of GMMIR process via US Patents to reduce the error of non-uniqueness in geophysical inversion testing of the Direct Current Resistivity Method/Electrical Resistivity Tomography (DCRM/ERT).
6. Development of prototype of Thunderbird electrical resistivity modelling system using “smart” electrodes including software and hardware.
7. Research of and development of a 3D slab-on-grade soil-structure interaction model for design and analysis of slabs for expansive clay soils.

## PUBLICATIONS

### Papers

M. ADIL HAQUE, JOHN T. BRYANT, “Failure of VERT Wall System: Forensic Evaluation and Lesson Learned” Geo-Frontiers 2011, ASCE 2011.

JOHN T. BRYANT, M. ADIL HAQUE, “Soil–Pipe Interaction Analysis: A Forensic Evaluation”, Geo-Frontiers 2011, ASCE 2011.

BRYANT, J.T. and HAQUE, M.A., "Performance and Design of Foundations on Unsaturated Expansive Soils", UNSAT 2010, Barcelona, Spain, accepted for Publication.

BRYANT, J.T., HAQUE, M.A., and ROSENBERK, R.S., "Performance and Design of Slab-on-grade and Pier Foundation Systems: Theoretical Considerations and Practical Applications", Geotechnical Special Publication No. 198, 2010.

HAQUE, M. ADIL and BRYANT, J. T., "Failure of Vertical Wall System: Forensic Evaluation and Lessons Learned", Electronic Journal of Geotechnical Engineering, Vol. 15E, 2010.

BRYANT, J. T., "The Theoretical Foundations of Geotechnical Engineering I: A Geotechnical Engineer Apologist's Perspective", Texas ASCE Proceedings, Harlingen, Texas, Spring 2009.

HAQUE, M. ADIL and BRYANT, J. T., "Generalized Relationships to Estimate Soil Properties from Electrical Resistivity", Texas ASCE Proceedings, Fall 2008.

BRYANT, J. T., "Simplified Approach to PTI 3.1 Method", PTI Journal, February 2008.

MORRIS, D. V., GEHRIG, M. H., SWEENEY, S. P., and BRYANT, J. T., "A Slow-Moving Landslide Characterized by Both Engineering and Geo-Electrical Techniques", 1<sup>st</sup> North American Landslide Conference, Vail, Colorado, June 2007.

BRYANT, J. T., NISTALA, S., MORRIS, D. V., SWEENEY, S.P., and GEHRIG, M. D., "The Zone/Area of Influence Concept in Design and Forensic Engineering and Geosciences", Texas ASCE Proceedings, Fall 2006.

BRYANT, J. T., PH.D., P.G., P.E., "A Mathematical Model for Point Source Moisture Migration: The Standard Plumbing Leak Model in Expansive Clay Soils", Texas ASCE Proceedings, Spring 2006.

MORRIS, D. V., BRYANT, J. T., and GEHRIG, M. D., "Differentiation of Water Sources Using Analytical Water Chemistry Data", TPG (The Professional Geologist), Volume 42, Number 6, pp 39-42, Sept/Oct 2005.

MORRIS, D. V., PH.D., P.E., GEHRIG, M. D., PE. PG., and BRYANT, J.T., PH.D., P.E., "Detection of Three-Dimensional Voids in Karstic Ground", The Tenth Multidisciplinary Conference, Texas ASCE Proceedings, San Antonio, Texas, September 2005.

PHILLIPS, H. F., P.E., PIERRY, R. F. JR., P.E., and BRYANT, J. T., Ph.D., P.G., P.E., "Reliability Based Soil Structure Foundation Interaction Evaluation Approach", Texas ASCE Proceedings, Spring 2004.

GEHRIG, M.G., BRYANT, J.T., and MORRIS, D.V., "Ground Penetrating Radar for Concrete Evaluation Studies", Texas ASCE Proceedings, Fall 2003.

PETRY, T. M., P. E., BRYANT, J. T., P.G., P.E., "Evaluation and Use of the Decagon WP4 Dewpoint Potentiometer", Texas ASCE Proceedings, Fall 2002.



BRYANT, J. T., MORRIS, D.V., SWEENEY, S.P, and GEHRIG, M. D., “Underground Cavity Evaluation Near Structures”, Texas ASCE Proceedings, Spring 2002.

BRYANT, J. T., MORRIS, D.V., SWEENEY, S.P., GEHRIG, M. D., and MATHIS, J. D., “Tree Root Influence on Soil-structure Interaction in Expansive Clay Soils”, Geotechnical Special Publication Number 115, Expansive Clay Soils and Vegetative Influence on Shallow Foundations, ASCE, Houston, Texas, 2001.

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“Natural Gas Study”, 2016 AEGIS Claims Seminar, Hyatt Regency Scottsdale Resort & Spa at Gainey Ranch, Scottsdale, Arizona, October 17-19, 2016.

“Design of Post-Tensioned Slab-on-Ground Foundations”, SOG Geotechnical Design Seminar, Post-Tensioning Institute, San Francisco, California, May 10, 2016.

“Investigation of Subsurface Anomalies Including Faults”, Foundation Performance Association (FPA), Houston, Texas, March 9, 2016.

“Application of Expansive Soil - Geotechnical Procedures”, 2015 PTI Convention, Royal Sonesta Houston Galleria, Houston, Texas, April 28, 2015.

“Shallow Foundation Design, Construction and Repair”, HalfMoon Education, Inc., El Paso, Texas, February 5, 2015.

“Reviewing Geotechnical Reports”, David Weekley Homes, Celebration, Florida, May 7-8, 2014.

“Soil Swell PVR Debate”, ASCE, CECOM 2014, Galveston, Texas, September 17-19, 2014.

“Sinkhole Diagnosis and Remediation”, American Foundry Society, Waco, Texas, March 1, 2013.

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“Application of Expansive Soil Geotechnical Procedures”, 17<sup>th</sup> Annual Building Professional Institute, The University of Texas at Arlington, Arlington, Texas, May 19, 2009.

“Site Investigation Techniques and Introduction to Shallow Foundation Design” and “Post-Tension Slab on Grade Design and Analysis/Brief on Deep Foundation Design and Analysis”, ASCE Fall Technical Seminar, Acadiana Branch, Lafayette, Louisiana, October 22, 2009.

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## **PROFESSIONAL AND COLLEGE ORGANIZATIONS**

American Society of Civil Engineers

American Institute of Professional Geologists

Gamma Theta Upsilon, Geographical Honor Society

Texas A&M University Association of Former Students

Texas A&M University Geology & Geophysics Advisory Council (GEODAC)

Texas A&M University Adjunct Faculty

**ACADEMIC HONORS**

New Mexico Jr. College Outstanding Student in Mathematics

New Mexico Jr. College Dean's Honor Roll

Texas A & M University Geography Scholarship

Texas A & M University Dean's Distinguished Honor Roll

**PROFESSIONAL HONORS**

Fellow, Post-Tensioning Institute.

Diplomate, Association of Geoprofessionals, American Society of Civil Engineers.

Best Paper.

# Dallas City Council

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APRIL 18, 2018



# Today's Discussion

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- Planned Outage
- System Modernization
- Safety
- Communication
- Customer Service and Billing



# Planned Outage: Overview

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In the days leading up to March 1, we began observing sudden and unexplainable system performance that was unprecedented in our company's history.

- Hired Geotechnical Engineering Firm
  - Preliminary findings indicated an extraordinary confluence of events, in a limited geographical area, damaged our pipeline system in that area.
  - Extraordinary combination of events that included:
    - Geology
    - Hydrology
    - Soil conditions
    - Record rainfall
    - Differential movement or lifting and expanding geological formations
  - Could not have been predicted, anticipated readily modeled or foreseen.

There is no current evidence this unusual combination of factors exists elsewhere in our system.

On March 1, Atmos Energy initiated a planned outage of its natural gas distribution system for approximately 2,500 homes in Northwest Dallas.



# Planned Outage: Overview

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## Operations

Set up a 24-hour Command Center that functioned as a service center for the area - became the largest service center in Atmos Energy

- Replaced all mains, services and meters
  - 152,000 feet of HD polyethylene pipe – distance from Dallas to Ft. Worth
  - 2,435 service lines
  - One year of work completed in approximately three weeks
- Hundreds of employees
- 120 contract crews
- 40+ plumbing crews



# Planned Outage: Overview

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## Customer Outreach

- Opened two Information Centers (Bachman Lake and Walnut Hill Recreation Centers) to assist with lodging and financial assistance.
  - Coordinated with the City of Dallas, OEM, CERT, Dallas County, American Red Cross and other local, county and state officials
    - Door to door campaign with OEM on March 1 to communicate project
- Created 24/7 hotline for residents
- Developed website for planned outage with daily updates
- Created interactive real-time map showing restoration progress
- Sent direct mail to all customers with planned outage information, letter from Vice President of Customer Service and safety brochures
- Daily updates to city officials, media and social media

## Financial Assistance

- Customers received more than \$15 million in financial assistance - \$250/day
  - Reloadable debit cards and ACH
- Coordinated plumbing repairs for more than 1,000 customers – typically customer responsibility
- Waived March and past-due bills for residents
- Offered appliance rebate



# Planned Outage: Project to Date

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April 11, 2018

- 2,422 customers are safely using natural gas in their homes today
  - 31 remaining relights – customers are assigned plumbers

## Follow Up Work

- Working to repair sidewalks, alleys and streets
- Working with residents on landscaping repairs
- Moving meters next to the home



# System Modernization: The Safest Provider

Our vision is to be the safest provider of natural gas services in the nation.

## System Safety

- Prioritized pipe replacement
- Pipeline integrity assessments
- Innovative leak detection
- New technology

## Public Safety

- Emergency response
- Customer & community education
- Public awareness

## Employee Safety

- State-of-the-art training
- Tools and equipment
- Ensure safe practices
- Quality assurance programs
- Operator qualifications



# System Modernization: Investment

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More than 80% of Atmos Energy investments are directed at pipe replacement

Since 2011 in Texas, Atmos Energy has

- Replaced 1,700 miles of distribution pipe, including 300 miles of cast iron
  - One crew replaces approximately 1.5 miles of cast iron per year
- Replaced approximately 195,000 steel service lines
- Lowered excavation damage per 1,000 line locates by 36%

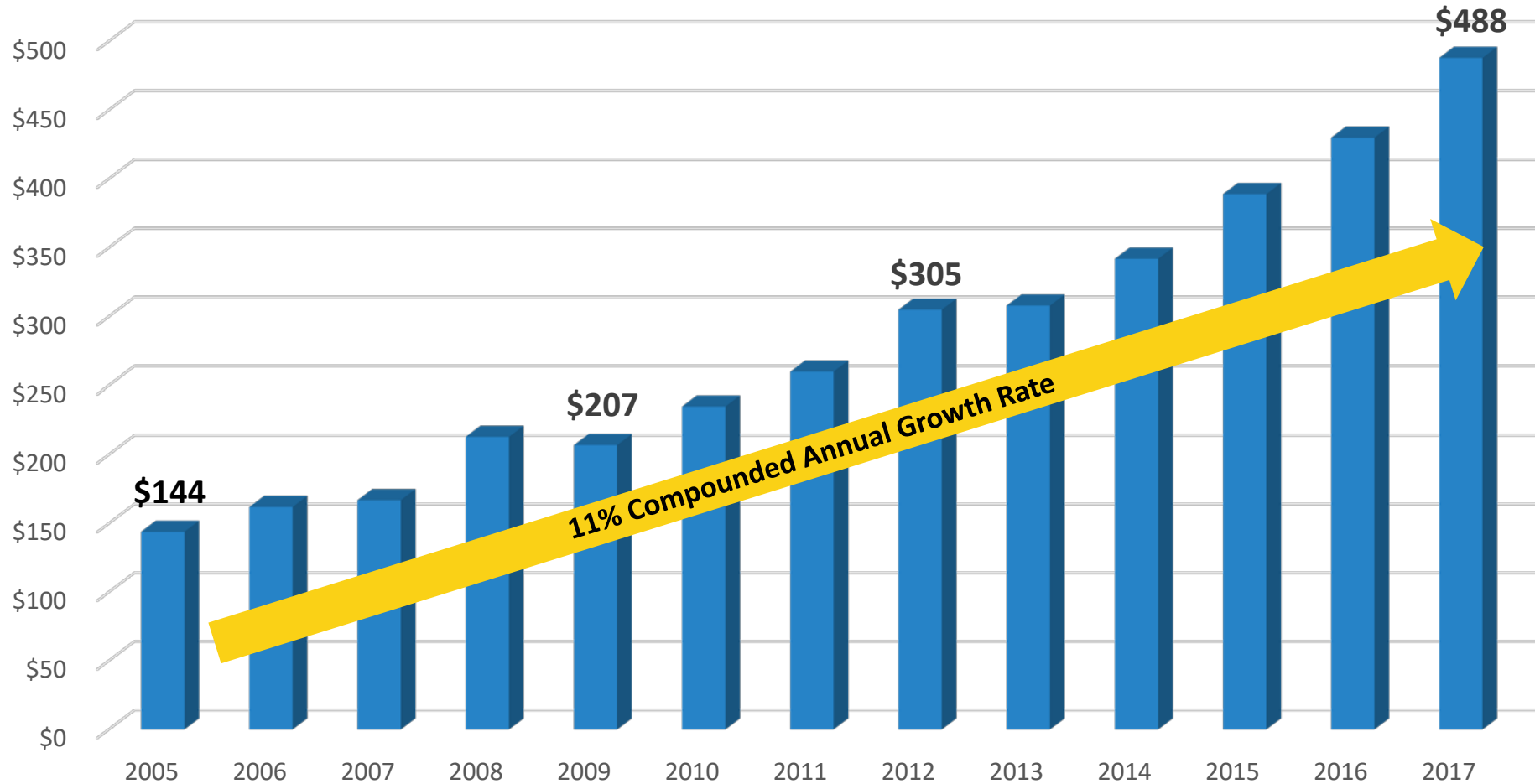
Since 2005, Atmos Energy Mid-Tex division has

- Invested more than \$3 billion in pipe replacement and safety-related modernization investment

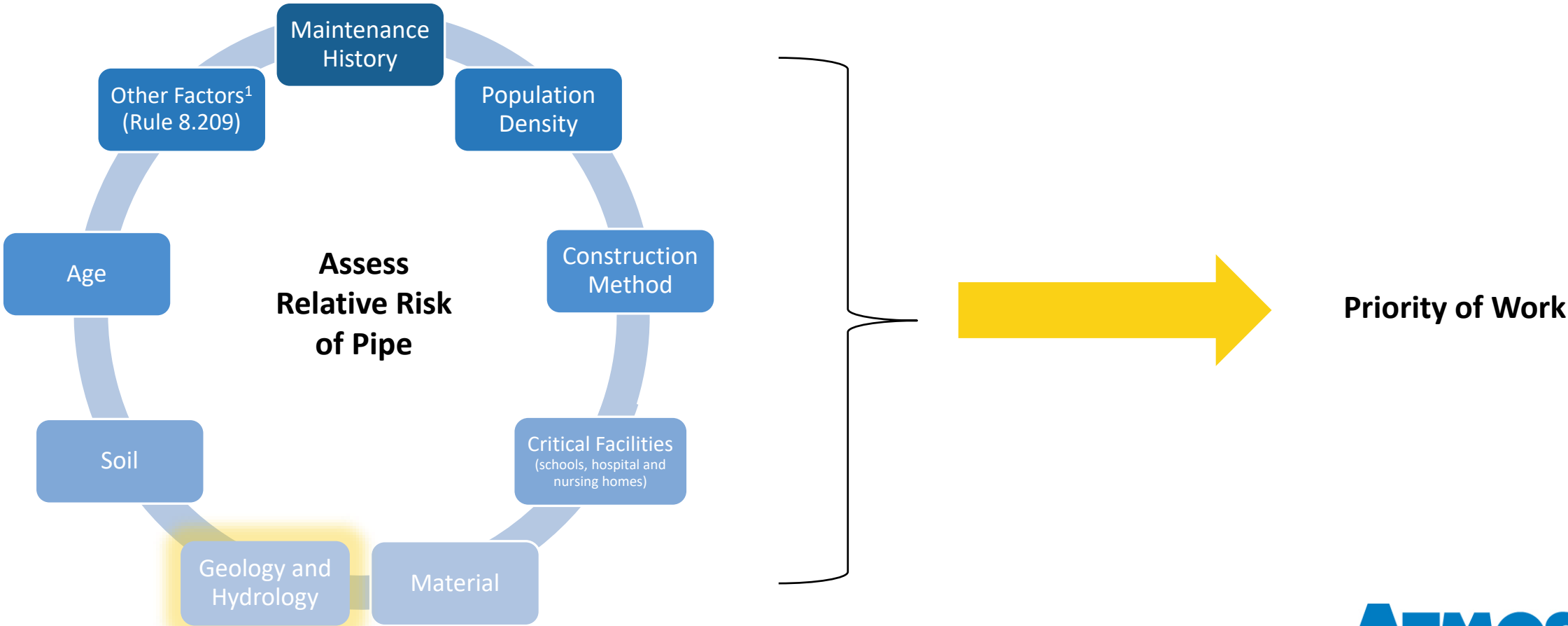
Plan to accelerate pipe replacement by investing additional \$3 billion in the next five years



# Texas Capital Expenditures



# Risk Based Prioritization Model



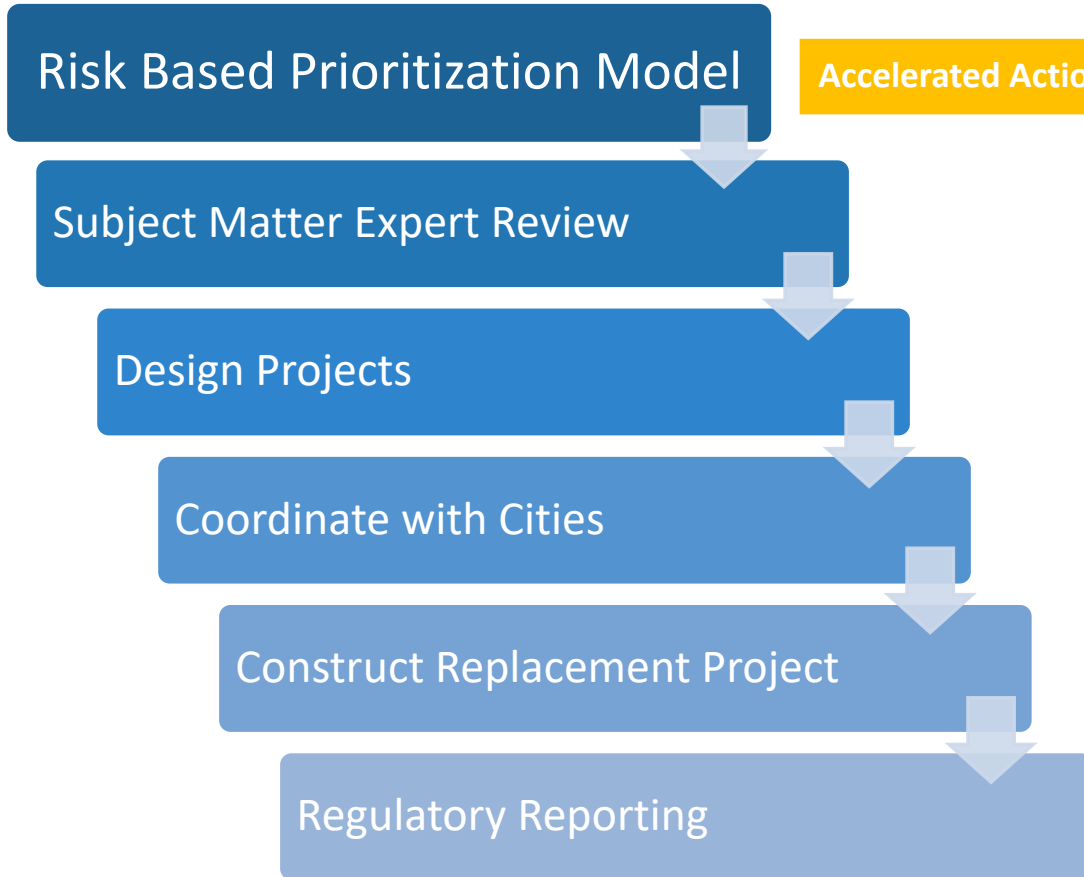
<sup>1</sup> • Pipe location • Composition and nature of the piping system: age, materials, type of facilities, operating pressures, leak history records, prior leak grade repairs and other studies  
• Corrosion history • Environmental factors that affect gas migration • Any other history known to the operator





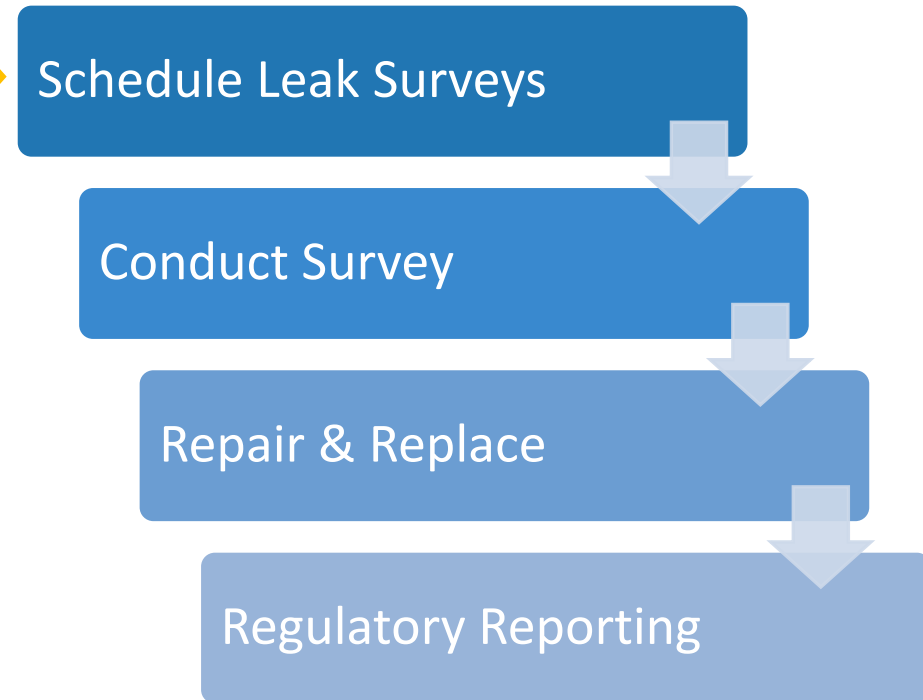
# Annual Prioritization of Work

## Modernization Work



Accelerated Action

## Maintenance Work



# City of Dallas Projects

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Since 2005, Atmos Energy:

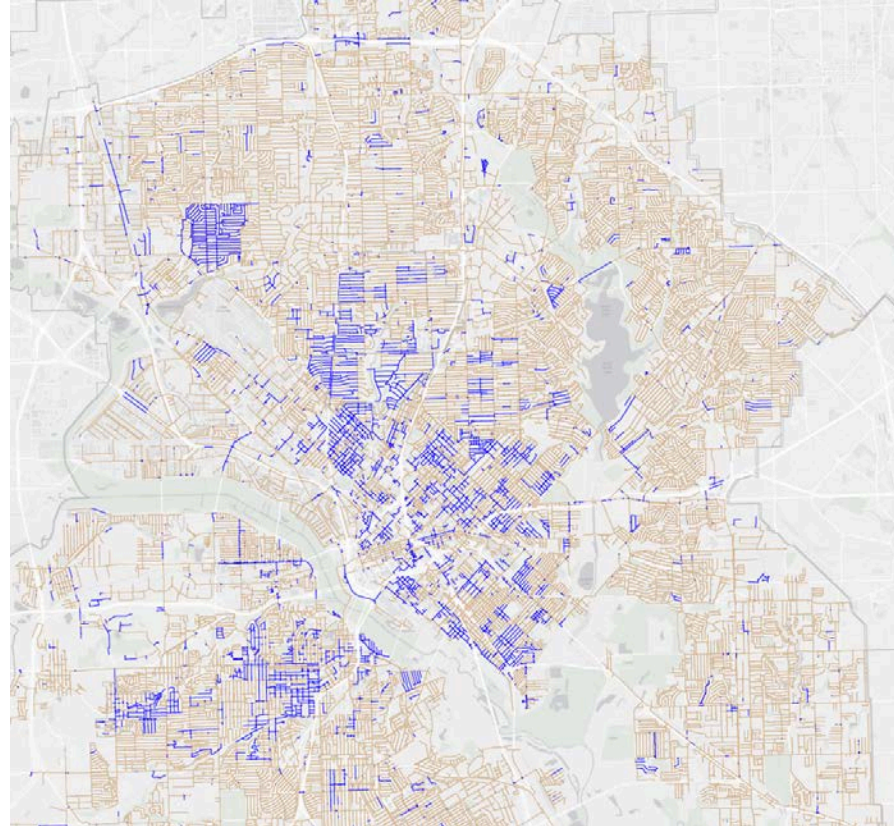
- More than 2,500 projects complete
- Total value: \$446 million

In FY 18, Atmos Energy:

- 1,343 scheduled projects

The following slides are samplings of the 40 largest projects in Dallas.

- 21 in progress
- 19 complete
- Estimated total value: \$51,541,454.44



# Top 40 Largest City of Dallas Projects FY 18

Status	Estimated or In Service Date	Estimated Value	Project Description	Location
In Progress	2018-06-30	\$ 12,866,055.02	Install 15,500 feet of 24 inch steel	Trinity River
In Progress	2018-11-26	\$ 8,446,456.42	Instaill approximately 28,030 feet of 2 in HDPE main, 7,805 feet of 4 inch HDPE main , 6,065 feet of 6 inch HDPE main, 170 feet of 8 inch HDPE main, and 6,010 feet of 12 inch HDPE main	Near Beechwood Lane and Lakemont Drive
In Progress	2018-06-30	\$ 7,721,131.85	Install 11,500 feet of 24 in steel	Trinity River
In Progress	2018-09-24	\$ 2,320,301.75	Install approximately 9460 feet of 2 inch HDPE main, 1,925 feet of 4 inch HDPE main, and 1885 feet of 12 inch HDPE main	Neach Midway Road and Ridge Road
In Progress	2018-10-04	\$ 1,983,911.94	Install 5910 feet of 2 inch HDPE, 195 feet of 4 inch HDPE, & 3070 feet of 6 inch HDPE Main; 175 service lines	Near Welch Road and I635
In Progress	2018-08-16	\$ 1,756,291.18	Install approximately 2,110 feet of 6 inch IP HDPE main and 7480 feet of 2 inch HDPE main	Near Webb Chapel Road and Manana Drive
In Progress	2018-07-10	\$ 1,518,774.30	Install approximately 1600 feet of 4 inch HDPE main	Near Warwick Drive and Merrell Road
In Progress	2018-08-03	\$ 1,294,006.72	Install approximately 6,140 feet of 8 inch IP HDPE main, 55 feet of 2 inch HDPE main, 30 feet of 4 inch HDPE main, and 10 feet of 6 inch HDPE main	Near Walnut Hill Lane and Lenel Place

# Top 40 Largest City of Dallas Projects FY 18 cont'd

Status	Estimated or In Service Date	Estimated Value	Project Description	Location
In Progress	2018-04-30	\$ 1,053,802.20	Install approximately 800 feet of 20 in steel	Near 2 <sup>nd</sup> Avenue and Parkdale Boulevard
In Progress	2018-09-24	\$ 976,516.66	Install approximately 8,530 feet of 2 inch HDPE main and 2,480 feet of 4 inch HDPE main and 2,340 feet of 6 inch HDPE main	Near Walnut Hill Lane, Dale Crest Drive and Park Lane
In Progress	2018-06-30	\$ 928,806.01	Install approximately 800 feet of 20 inch steel	Near Webb Chapel Road and I635
In Progress	2018-04-30	\$ 858,147.64	Replace 450 service lines	Sceyene Road and Glovers Pass
In Progress	2018-06-21	\$ 820,953.32	Install approximately 6720 feet of 2 inch IP HDPE main	Near Midway Road and Beaverbrook, Brookport, Northview and Cinderella
In Progress	2018-06-29	\$ 781,701.11	Install approximately 2,290 feet of 2 inch IP HDPE main and 1460 feet of 4 inch HDPE main	Near Midway Road and Melissa Lane, Bobbit Drive, St. Lazare Drive and Reaumur Drive
In Progress	2018-08-29	\$ 722,241.84	Install approximately 3,300 feet of 6 INCH HDPE main	Near Royal Lane, Waldorf Drive and Vancouver Drive
In Progress	2018-04-28	\$ 702,774.33	Install approximately 3,780 feet of 2 inch IP HDPE MAIN and 600 feet of 4 inch HDPE main	Near Rosser Road, Royal Palms Street, Deep Valley Drive and Crest Cove Circle
In Progress	2018-06-30	\$ 636,306.74	Install approximately 2800 feet of 8 inch IP HDPE main and 610 feet of 2 inch DPE main	Near Webb Chapel Road and Storey Lane

# Top 40 Largest City of Dallas Projects FY 18 cont'd

Status	Estimated or In Service Date	Estimated Value	Project Description	Location
In Progress	2018-10-11	\$ 563,435.45	Install approximately 2490 feet of 2 inch IP HDPE main and 300 feet of 4 inch IP HDPE main	Near Elsby Avenue and Hanover Avenue
In Progress	2018-06-26	\$ 555,416.62	Install approximately 285 feet of 2 inch poly main and 1,200 feet of 4 inch poly main. Replace 2 0.75 INCH service lines	Near S. Ervay Street, Parker Street and Holmes Street
Completed	2018-03-04	\$ 539,044.66	Install approximately 2910 feet of 4 inch main	Near Royal Lane and Pinocchio Drive
In Progress	2018-09-04	\$ 522,674.59	Install approximately 1,350 feet of 4 inch poly main and 625 feet of 6 inch poly main. Replace 37 0.75 inch services	Along Marydale Drive and N Oak Cliff Blvd
Completed	2018-01-27	\$ 379,966.92	Install approximately 775 feet of 2 inch IP HDPE main and 795 feet of 4 inch IP HDPE main	Near E Greenway Blvd. near Emerson Ave
Completed	2018-01-26	\$ 298,752.78	Install approximately 1,720 feet of 2 inch poly. Replace 38 - 0.75 inch services	Near Texas Drive and Superior Street
Completed	2018-02-23	\$ 298,687.18	Install approximately 1,635 feet of 4 inch poly main	Near Buffview Blvd. and Cherokee Trail
Completed	2018-02-11	\$ 277,653.35	Install approximately 1,930 feet of 2 inch IP HDPE main	Near Nutting Drive and Timothy Drive
Completed	2018-03-29	\$ 262,755.57	Install approximately 1,350 feet of 4 inch main	Near Meletio Lane and Williamstown Road

# Top 40 Largest City of Dallas Projects FY 18 cont'd

Status	Estimated or In Service Date	Estimated Value	Project Description	Location
Completed	2018-03-23	\$ 245,178.33	Install approximately 100 feet of 12 inch IP HDPE main and 15 feet of 4 inch IP HDPE main	Near N Rosemont Avenue and Ranier Street
Completed	2018-02-14	\$ 221,509.01	Install approximately 885 feet of 2 inch poly main, and 540 feet of 4 inch poly main	Near Kessler Parkway and Sylvan Avenue
Completed	2018-02-12	\$ 201,001.28	Install approximately 1,365 feet of 4 inch IP poly main.	Near Santa Clara Drive and Whittier Avenue
Completed	2018-02-14	\$ 196,226.54	Install approximately 1,750 feet of 2 inch poly main. Replace 7 0.75 inch services	Near MLK Blvd. and Jefferies Street
Completed	2018-01-22	\$ 184,751.79	Install approximately 1,890 feet of 2 inch IP HDPE main	Near Lawrence Street and Marder Street
Completed	2018-02-19	\$ 183,803.12	Install approximately 1,750 feet of 2 inch HDPE main and 50 feet of 4 inch HDPE main	Near Marder Street, Malcom X Boulevard, Myrtle Street, Lawrence Street, Elsie Faye Heggins St
Completed	2018-01-11	\$ 182,020.03	Install approximately 690 feet of 4 inch IP poly main, and 905 feet of 2 inch IP poly main	Near Santa Clara Drive and Whittier Avenue
Completed	2018-01-24	\$ 171,376.50	Install approximately 915 feet of 2 inch IP HDPE main and 320 feet of 4 inch IP HDPE poly main	In alley near Norris Street and St. Moritz Avenue
Completed	2018-01-31	\$ 168,132.38	Install approximately 1,395 feet of 2 in IP poly main	Near Delaware Avenue and S Van Buren Avenue

# Top 40 Largest City of Dallas Projects FY 18 cont'd

Status	Estimated or In Service Date	Estimated Value	Project Description	Location
Completed	2018-01-18	\$ 158,465.87	Install approximately 1,150 feet of 2 inch poly	Near Ash Lane and S Fitzhugh Avenue
Completed	2018-02-08	\$ 150,137.41	Install approximately 100 feet of 6 inch HDPE and 60 FT of 2 inch HDPE main. Replace 1 0.75 inch service	Near Dyson Street and Carlton Garrett Street/310
Completed	2018-01-10	\$ 136,200.55	Install approximately 1,820 feet of 2 inch poly main	Near Cedar Crest Blvd. and Peabody Avenue
Completed	2018-02-14	\$ 128,278.35	Install approximately 1,750 feet of 2 inch poly main. Replace 7 0.75 inch services	Near MLK Blvd. and Jefferies Street
Completed	2018-03-26	\$ 127,807.13	Install approximately 650 feet of 8 inch HDPE main	Near Lombardy Lane, West of Abernathy Avenue

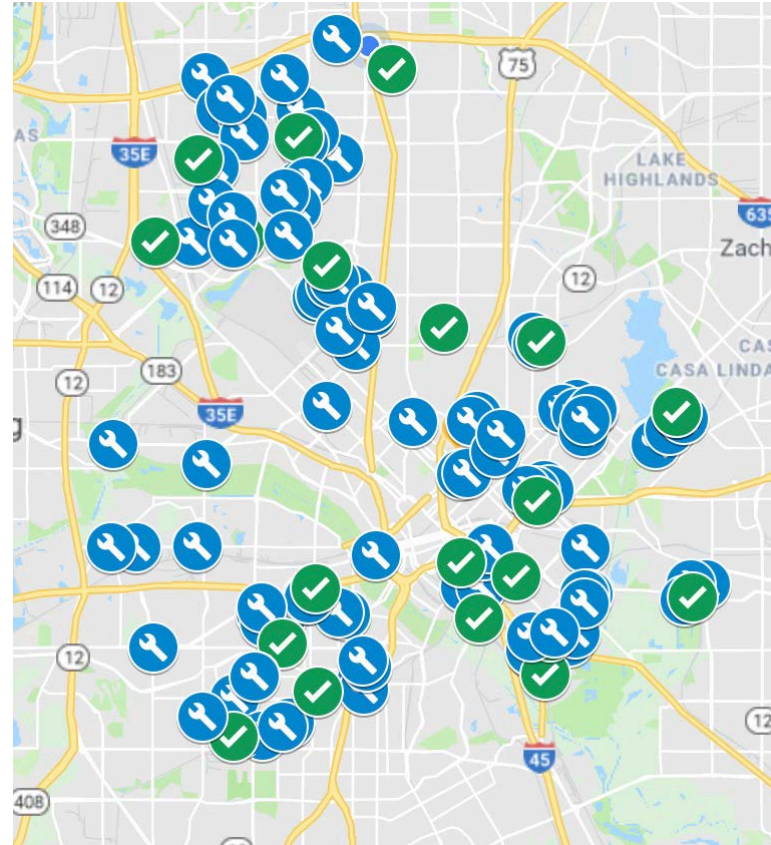


# City of Dallas 2018 Projects

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Interactive map with further details available

- [Click here](#)





# Plans for the City of Dallas

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## Crews

- Double contract crews from 40 to 80 by December to accommodate prioritized replacement projects in Dallas

## Cast Iron

- Cast Iron replacement scheduled to be complete CY end 2023

## Bryant Report

- Incorporate findings of Bryant Consulting Work into the Risk Based Prioritization Model

## Increased Investment

- Plan to increase pipe replacement spending 11% annually over the next five years

## Pace of Replacement

- Investigating feasibility of further increasing pace of pipe replacement projects in Mid-Tex division beyond plan

# Safety: Monitoring and Prevention



The majority of significant natural gas leaks are damages by third party

Atmos Energy located more than 1.17 million pipelines in Texas in 2017 for third party contractors and homeowners

- 3,575 damaged lines in 2017
- Calling to have underground utility lines marked is the law in Texas



# Safety: Monitoring and Prevention

Leaks are a primary safety focus for all natural gas utilities and extensive precautions are taken to prevent, detect and eliminate leaks.

- Leaks
  - Graded 1, 2 or 3 – regulated by state and federal rules
  - Scheduled for repair and replacement based on grading of the leak
  - **When a hazardous leak is found, Atmos Energy takes immediate action to eliminate the hazard and replace the pipe segment**
- Leak Survey Technology
  - Remote Methane Leak Detectors (RMLDS) use lasers to detect and pinpoint leaks
  - State-of-the-art mobile leak detection uses gas-analysis instruments, which is 1,000 times more sensitive than traditional technology



# Communication: Stakeholders

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## City

- Atmos Energy employees work with the City of Dallas to communicate replacement projects throughout the city
  - City Inspectors
  - Public Works
  - Permits
  - Council members

## Railroad Commission of Texas

- 100+ safety compliance audits on the Mid-Tex system each year
- Leak distribution data, work plans, and replacement reports and annual filings on our website

## Customers and Community

- Investing in Safety Communication Strategy
  - Created for customer outreach
  - Informs customers of work in their neighborhoods with doortags, letters, signs and other tools
- Community events with local chambers, HOA's, non-profits, schools, etc. to promote safety messages



# Communication: Customers



Project Sign

Español al reverso

**Atmos Energy is upgrading natural gas lines in your neighborhood.**

**Why is Atmos Energy doing this?**  
Because we're committed to being the safest natural gas provider, we're investing over \$1 billion a year in system upgrades. It's how we provide you with safe and reliable natural gas service for generations to come.

**What does this mean for me?**  
When replacing pipes, it may be necessary to dig on or around your property. If this happens, Atmos Energy will make temporary repairs to yards, sidewalks, and pavements until work is completed. We will then make arrangements with you to restore the affected areas. Pipe replacement may also result in a brief interruption to your gas service.

**What do I need to do?**  
Nothing right now. We are letting you know that our crews will soon be in your neighborhood. If your natural gas service is interrupted during this process, we'll inform you in-person or leave a door tag explaining what was done.



If you have any questions, please call 888-286-6700 during business hours. To learn more about pipeline upgrades, visit [atmosenergy.com/safety](http://atmosenergy.com/safety).



Your natural gas company

**FOR YOUR SAFETY:** If you smell natural gas or suspect a leak, leave the area immediately, then call 911 and Atmos Energy at 866-322-8667. Do not light a match or operate any electrical appliances or switches. In construction areas, do not disturb excavation or required safety barricades.

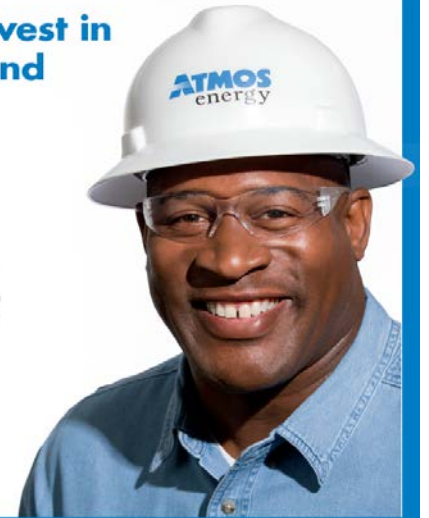
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Customer Doorhanger

## Advertisement

**We're upgrading our natural gas pipelines from the ground up.**

**It's how we invest in homes, lives and generations.**



Atmos Energy is committed to being the safest natural gas provider in the nation. That's why we're investing between \$90 and \$105 million a year in system upgrades. It's how we provide you with safe and reliable natural gas service for generations to come.



Visit [atmosenergy.com/LouisianaSafety](http://atmosenergy.com/LouisianaSafety) to learn about upgrades in your area.



# Customer Service and Billing: Estimated and Actual Readings

Estimated meter reading is common practice among utility companies

- Technology estimates current period usage based on customer’s historical usage
- Customer bills show “Actual Usage” or “Estimated Usage”
- Keeps customer bill lower by minimizing labor costs associated with reading meters
  - Out of 1.6 million bills, only 30% are estimated during the winter months.

Estimated meter reading can be higher or lower than actual usage

- Bill will correct when an actual reading occurs the next month
  - Customers will never pay for gas that wasn’t consumed
  - If a customer is over estimated, a credit is applied unless a refund is requested by the customer

By law, Atmos Energy does not mark up the cost of natural gas. Customers pay what we pay to purchase natural gas.

Your Billing Detail Information:

Meter Serial #	Date of Service		Meter Reading	
	From	To	Previous	Present
040126670	2/8/17	3/6/17	8755	8811
Read Difference:				56.00
Estimated Usage in CCF:				56.00

Your Billing Detail Information:

Meter Serial #	Date of Service		Meter Reading	
	From	To	Previous	Present
040126670	3/7/17	4/6/17	8811	8865
Read Difference:				54.00
Actual Usage in CCF:				54.00



# Customer Service and Billing

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We offer several ways for customers to manage their household budget and winter surprises to their natural gas bill. One way is through Budget Billing. Budget Billings is based on a rolling, 12-month average of their bill and adjusts each month.

If a customer has a question about the accuracy of their bill, they can:

- Call us at 1-888-286-6700
- Customers may take a picture of the meter and submit it to us at our website through our Account Center for review.



# About Atmos Energy

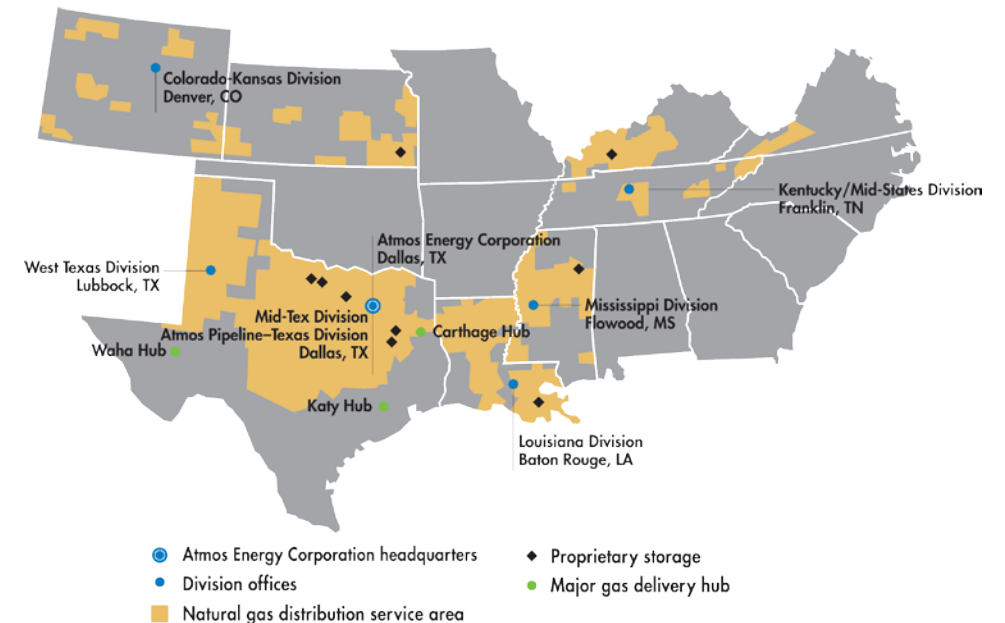




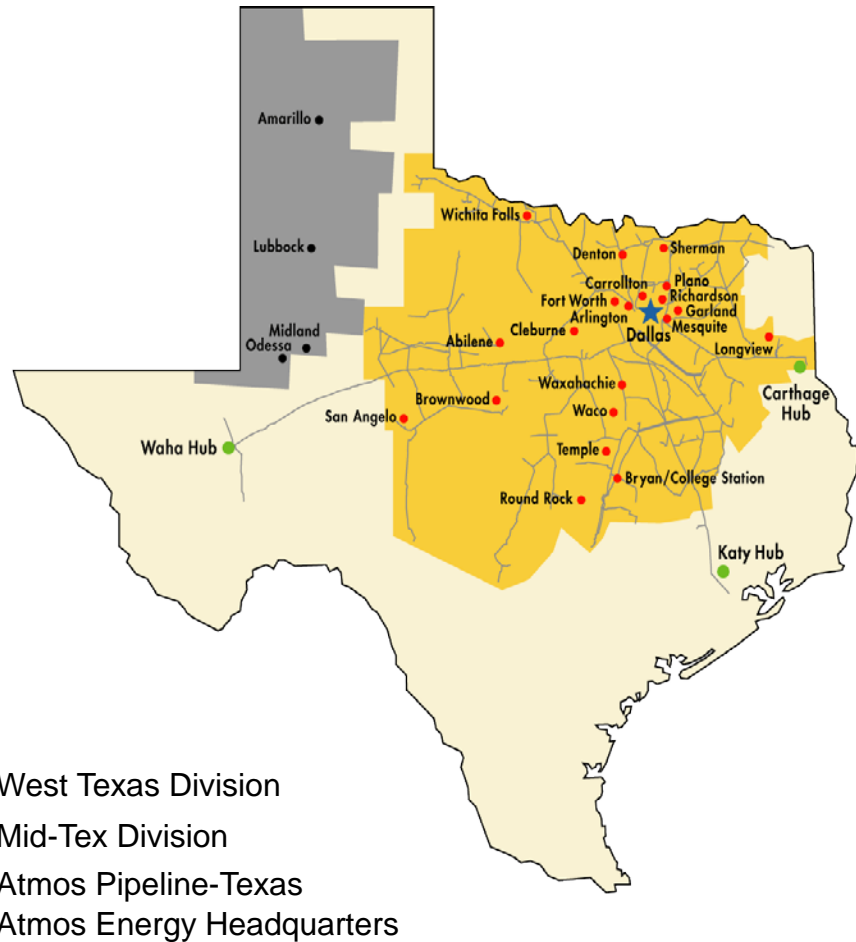
# About Atmos Energy: Your Natural Gas Company

Atmos Energy is the largest natural gas-only distributor in the nation. Atmos Energy is fully regulated natural gas delivery company that leads the industry in infrastructure modernization investment and enhancing the safety and reliability of the system.

- 76,000 miles of distribution and transmission pipelines
- 3.2 million customers
- Operates in eight states across six utility divisions
- 4,600 employees
- Leading in natural gas system modernization
  - \$8 billion in CAPEX (2018-2022)



# About Atmos Energy: Texas



70% of company assets are in Texas

- Mid-Tex Division
- West Texas Division
- Atmos Pipeline – Texas (intrastate pipeline)

70% of projected 2018 CAPEX deployed in Texas

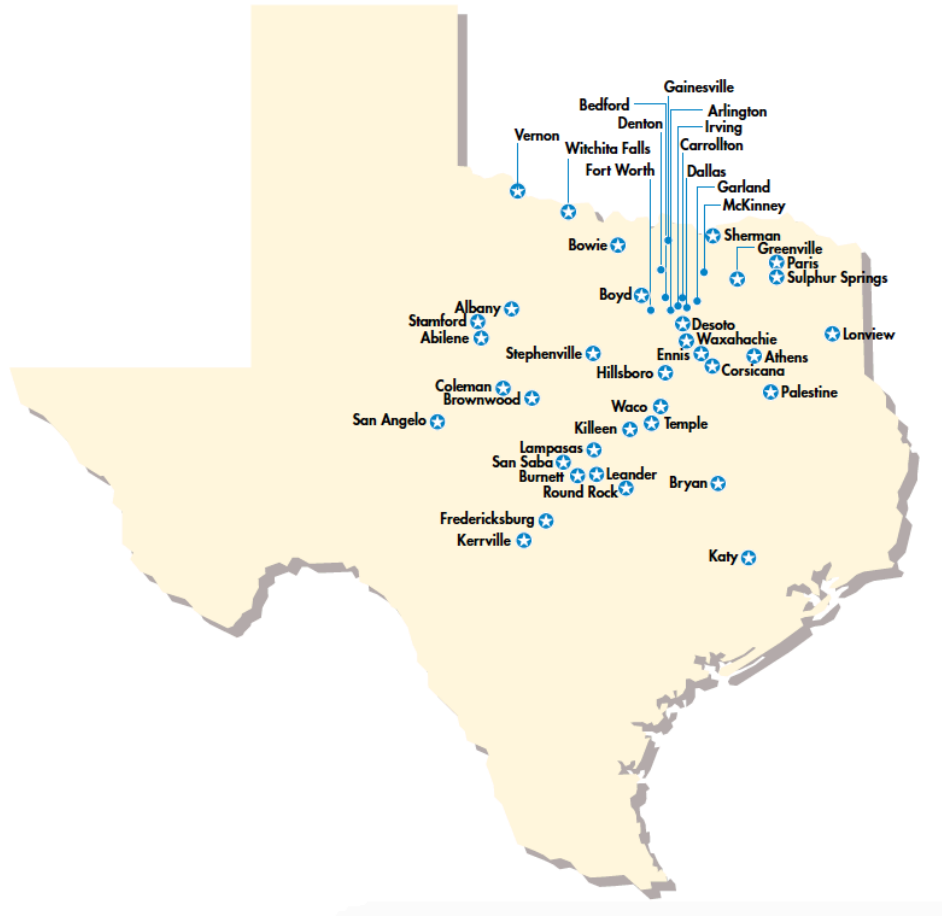
- \$935 million - \$1 billion (2018 CAPEX)
  - \$560 - \$590 million for distribution
  - \$375 - \$450 million for intrastate pipeline (Atmos Pipeline – Texas)

Texas supports our other divisions and customers

- Two customer contact centers (Waco and Amarillo)
- 24/7 Emergency Number
- Central Dispatch
- Industry leading Training Center – Charles K. Vaughan Center in Plano, Texas
- Safety and Compliance Program Development
- Corporate Headquarters



# About Atmos Energy: Mid-Tex Division



Atmos Energy's Mid Tex Service Centers

- 1.6 million customers
  - 226,000 customers in Dallas
- 31,000 miles of pipeline
- 550 communities
- 1,700 employees
  - 817 work in Dallas offices

