



Texas Pipelines:

KEEPING THE ECONOMY PUMPING

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Key Facts



Jobs Created Per Mile of Pipeline Construction:

 **Oil: 24.1**  **Natural Gas: 57.9**

 Average Annual Salary in Natural Gas Distribution: **\$78,890**
Annual State and Local Tax Revenue Generated by Texas Pipelines: **\$1.6 Billion**
Average Annual Salary for Pipeline Transportation of Natural Gas: **\$70,050**



99.999%
Safety Record of
U.S. Pipelines



Total Miles of Pipelines in
the U.S.: **2.7 Million**
Total Miles of Pipelines in
Texas: **440,000**



16.2 Billion Barrels
of Oil & Petroleum Products
Delivered by Pipeline Each Year

Increase in Natural Gas Pipeline Capacity in 2016: **7.1 Bcf/d**

Executive Summary

If oil and natural gas are the lifeblood of the Texas economy, the almost 440,000 miles of pipelines are the critical veins and arteries that keep the Lone Star State's economy pumping. As the country's largest oil and natural gas producer and consumer, Texas relies on pipelines to collect crude oil and natural gas from the well site (gathering lines), transport across the state or country (transmission lines) to U.S. refineries and terminals, and then distribute finished products directly to fuel stations, businesses, and homes (distribution lines) safely and reliably. But it's not just Texas. Across the United States, there are **more than 2.7 million miles of pipelines** that communities from coast to coast depend on every day.

While Texas energy development depends on pipelines, these critical pieces of infrastructure play more than just a supporting role. In 2013 alone, Texas pipeline operations and construction delivered over \$33 billion in economic output, supporting more than 165,000 jobs and adding over \$18.7 billion to the gross state product. Moreover, this activity accounted for over \$1.6 billion in state and local tax revenue. The pipeline industry is an important driver of economic activities in the state of Texas and beyond. It is estimated that pipelines in Texas will contribute \$374 billion in total economic output between 2014 and 2024.

To put some of these numbers in perspective, Texas pipeline operations and construction in 2013 supported enough jobs to employ the entire population of Waco, Tex., - with 30,000 to spare - while providing over \$10 billion more in economic output than Texas' **entire commercial aviation industry** that year (\$21.6 billion).

In addition to economic benefits, pipelines allow crude oil, petroleum products, and natural gas to be safely transported over large distances, and from places that would otherwise be difficult to reach. Pipelines also help keep energy affordable by ensuring an efficient transportation source, which means the natural gas that heats your home and the gasoline you use to fill up your car both cost less. With natural gas being the largest source of electricity - both in Texas and now across the United States - these cost savings mean households pay less on their monthly electricity bills.

¹ This jobs number, along with several other Texas specific numbers mentioned in this paper, comes from a study by researchers at Texas Tech conducted in 2014, and thus does not include impacts from the recent expansion in oil and gas activities in the Permian. While it would be reasonable to assume development in the Permian has resulted in greater economic benefits for Texas than those listed, the Texas Tech report is the most up-to-date analysis of Texas specific economic contributions from oil and gas development.

Pipelines also help improve air quality. Since 2006, the increased use of cleaner-burning natural gas – nearly all of which is delivered through pipelines – in America's electric grid has prevented more than 1.5 billion metric tons of carbon dioxide (CO₂) emissions. That's over 60 percent more carbon savings than what renewables have delivered over the same period. Moreover, advancements in emission mitigation technology, pipeline integrity, maintenance and new construction techniques have allowed the natural gas transmission industry to reduce the number of pipeline leaks by 94 percent over the past three decades. These technologies have prevented 122 million metric tons of CO₂ equivalent emissions.

Pipelines are widely recognized as the safest way to transport crude oil, natural gas, and petroleum products. According to data from the U.S. Pipeline and Hazardous Materials Safety Administration and the Federal Energy Regulatory Commission, 99.999 percent of crude oil, petroleum products and natural gas transported by pipelines reach their destinations safely. Pipeline incidents potentially impacting people or the environment outside of operators' facilities are down 52 percent since 1999.

This brief report summarizes the economic and environmental benefits of pipelines, with an emphasis on Texas, which has the most extensive oil and natural gas pipeline infrastructure in the country.

Pipelines 101

The fact that pipelines are in the news demonstrates their critical role in our economy.

Pipelines safely operate all across the country, and have done so for many decades. In fact, there are more than 2.7 million miles of pipelines that transport oil, petroleum products, and natural gas. IHS Economics estimates that nearly 13,000 miles of new oil and natural gas transmission pipelines were built in the United States in 2015, which is a 29 percent increase over the last five years. Nationally, this network of pipelines allows affordable natural gas to be delivered safely and reliably to over 177 million Americans. As a result, natural gas pipelines have helped consumers realize \$874 in annual savings through natural gas use.

In Texas alone, 440,000 miles of pipelines connect the Panhandle and the Permian to Beaumont and Brownsville – and pretty much everywhere in between. Every year, more than 16 billion barrels of oil and petroleum products are delivered by pipelines in

the United States, a 20 percent increase since 2010. To put that into perspective, last year the United States produced a little over 3.2 billion barrels of oil, meaning American pipelines are about more than just oil: they help deliver gasoline to communities all over the country, and they enhance our ability to trade with the rest of the world.

As PHMSA observes:

“ Pipelines enable the safe movement of extraordinary quantities of energy products to industry and consumers, literally fueling our economy and way of life. The arteries of the Nation’s energy infrastructure, as well as one of the safest and least costly ways to transport energy products, our oil and gas pipelines provide the resources needed for national defense, heat and cool our homes, generate power for business and fuel an unparalleled

”

Economic and Community Benefits

Nationally, pipelines support more than 511,000 jobs. Every mile of oil and natural gas pipeline creates between 24.1 and 57.9 jobs. As many as nine manufacturing jobs are also supported for each mile of pipeline constructed. In 2015, nearly 350,000 jobs were supported by the construction of new natural gas transmission pipelines, and an additional 164,000 jobs were supported by new crude oil pipelines. More than 86,000 of those jobs were in manufacturing.

Salaries for pipeline workers are often well above the national average. The annual salary for workers in natural gas distribution, for example, averages \$78,890 according to the latest data from the Bureau of Labor Statistics. Many occupations in natural gas distribution pay over \$100,000 per year.

A report from researchers at Texas Tech University found that pipelines supported more than 165,000 jobs in Texas. In 2013, pipelines added more than \$18.7 billion to the gross state product and generated more than \$1.6 billion in state and local tax revenue. Additional pipeline development in the state is projected to support an average of 171,000 jobs annually and add \$212 billion to the gross state product by 2024, according to an analysis from the Texas Pipeline Association.

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From 2014 to 2024, pipelines will also contribute as much as \$2 billion in new state and local tax revenue. Moreover, according to a recent [report](#) from the Texas Oil & Gas Association, spending on pipeline expansion nationwide has skyrocketed, with natural gas pipelines seeing a 94 percent increase and oil pipelines experiencing a 190 percent increase in investment from 2015 to 2016.

The numbers for individual companies and projects in Texas are impressive in their own right.

As an example, [Enbridge](#) alone had total capital expenditures of \$359 million for pipelines in Texas in 2016. These investments included steel pipe, leases, system integrity upgrades, and other equipment purchases. The company's operating and administrative expenditures in the Lone Star State, which includes salaries and wages, was also more than \$300 million in 2016. Enbridge paid \$27 million in property taxes that year, along with \$4.5 million in sales and use taxes.

Construction of the [Rio Bravo pipeline](#), which will transport natural gas from the Eagle Ford region of South Texas to the Port of Brownsville to service the proposed Rio Grande LNG terminal, is estimated to have a total economic impact of \$4.3 billion in Texas during the construction and non-operational period of the LNG project. The pipeline will also support more than 8,200 Texas jobs annually during this period and generate an additional \$1.4 billion in personal income for Texans.

But even these numbers don't capture the full economic significance of pipelines in the United States. Natural gas is a critical feedstock for petrochemical manufacturers, and over the past decade chemical companies have announced nearly \$180 billion in new capital investment in the United States to take advantage of low-cost shale gas. The American Chemistry Council estimates that these investments could yield up to 462,000 new jobs by 2025.

It's a basic concept, but manufacturers cannot take advantage of abundant natural gas in the United States if there isn't a way to transport the product from the well site. That's why the American Chemistry Council lists "Expediting the building of infrastructure, such as pipelines, that links energy production to chemical facilities" as one of its [key policies](#) to realizing the full economic opportunity from shale gas.

Thus, in addition to the direct and indirect economic impacts from construction and operation, pipelines also facilitate critical downstream investments. America's recent [manufacturing renaissance](#) simply would not be possible without pipelines.

Safety and the Environment

Pipelines are an exceedingly safe way to transport energy products. From centralized control centers, pipelines are monitored 24 hours per day, and field personnel throughout the pipeline systems provide a local presence to maintain day-to-day operations and maintenance. Federal regulators have observed that when it comes to transporting petroleum and natural gas, “pipeline systems are the safest means to move these products.” With a safety record of 99.999 percent, it’s easy to see how they came to that conclusion.

That’s not to say, however, that other forms of transportation are unsafe. In some situations, existing infrastructure (or lack thereof) makes alternatives like trucks or rail a safer and more cost-effective option. But there’s a reason why we have 2.7 million miles of pipelines crisscrossing the United States: they’re the safest, most efficient, and environmentally responsible way to deliver fuel from point A to point B.

Pipelines have also played a critical role in improving air quality by ensuring safe and efficient delivery of natural gas to end users. Since 2006, the increased use of natural gas in electricity generation has prevented more than 1.5 billion metric tons of CO₂ from being emitted, according to the U.S. Energy Information Administration. In fact, the United States has consistently led the world in greenhouse gas reductions over the past several years, even as our economy has grown, thanks to affordable and clean-burning natural gas. Virtually all of that natural gas is transported through extensive networks of gathering, transmission, and distribution pipelines. Moreover, the increased use of natural gas has helped decrease levels of other air pollutants such as lead, sulfur dioxide and nitrogen oxides by 99 percent, 85 percent and 56 percent, respectively.

But these air quality benefits are not limited to the United States. Natural gas exports to Mexico via pipelines increased by over 320 percent between 2006 and 2016, according to the U.S. Energy Information Administration, which will help that country reduce its own air pollution. These emissions reductions will also help improve air quality in Texas, since the northeast region of Mexico – which includes the Texas-Mexico border – is projected to see the largest increase in natural gas consumption of any region between 2015 and 2029. Further, with the development of U.S. liquefied natural gas exports, domestically produced natural gas will be able to help our trading partners meet their emissions reduction goals as well.

Although pipelines are safe and are helping us achieve important environmental goals, companies continue to invest in new technologies and other upgrades to reduce risks

risks even further. Liquids pipeline operators reported spending \$2.2 billion evaluating, inspecting and performing maintenance on their pipeline systems in 2014, the most recent year for operator inspection and maintenance data. Operators spent \$1.6 billion on existing pipelines, \$329 million on storage tanks and \$268 million on new pipeline hydrostatic testing.

Further, according to the [American Gas Foundation](#), the natural gas industry invests \$22 billion every year in maintaining the integrity and improving the safety of transmission and distribution lines. This commitment to safety and efficiency has proved vital, as the number of pipeline leaks from local distribution systems has dropped as much as 25 percent since 1990. Additionally, research published in 2015 found that leaks from local distribution systems were between [36 percent and 70 percent](#) lower than what even the U.S. Environmental Protection Agency had estimated. The liquids pipeline industry has also seen significant increases in reliability and safety, as the number of reportable liquids pipeline incidents (those exceeding five barrels) fell by 52 percent since 1999, according to the Pipeline and Hazardous Materials Safety Administration.

But as with any industry, rare incidents are still incidents. Thankfully, when it comes to pipelines, those rare incidents are typically small. In 2015, according to [data](#) compiled by the Association of Oil Pipe Lines, 65 percent of pipeline incidents involved the release of less than five barrels of liquids. Of all incidents involving liquids releases, 44 percent were less than one barrel.

Effectively containing releases is part of the textbook of development, and it's required by law. All pipeline operators are required to develop pipeline safety public awareness programs, which educate people who live near pipelines about precautions and other safety measures. These programs also inform emergency responders at the state and local level. PHMSA has a useful [frequently asked questions page](#) about pipelines and keeping communities safe.

In Texas, pipeline companies are regulated by the Railroad Commission. In 2014, Texas received a [100 percent evaluation score from PHMSA](#) for its enforcement programs targeting both natural gas and hazardous liquids pipelines. Since 2001, the number of gas pipeline violations in Texas has decreased by 61 percent. In December 2016, the Railroad Commission introduced an [improved enforcement process](#) for pipeline safety, which included a 10 percent increase in penalties for non-compliance.

According to the [Texas Pipeline Association](#), Texas was the first state to adopt pipeline safety regulations, beginning in the 1930s. In the 2000s, Texas mandated a pipeline integrity management program, which exceeds the standards set forth in the federal program

Conclusion

Texas is the largest oil and natural gas producing state, and it's also a major consumer, so it is certainly no stranger to pipelines. Energy produced in all corners of the Lone Star State, such as the Barnett Shale in North Texas and the Permian Basin in West Texas, is transported to Texas cities, other states, and even other countries, with much of this transportation occurring through an extensive pipeline network.

As this report has shown, these pipelines are economic engines in their own right, but they also support manufacturing and other industries throughout the supply chain. They support over 160,000 jobs in Texas, and provide billions of dollars in state and local tax revenue to help fund public services that we all use. They support further U.S. energy development by providing a safe, economically competitive, and environmentally responsible way for oil and natural gas to move from the well head to end use. Most importantly, they ensure that our lights can stay on, that our homes are warm in the winter, and that our vehicles have fuel to get us to work every day.

From jobs and tax revenue to helping us reduce emissions, pipelines are a critical part of our daily lives in Texas. As an economy that depends on energy, we are also an economy that depends on pipelines.