



# County of Fairfax, Virginia

## MEMORANDUM

**DATE:** March 22, 2024

**TO:** Board of Supervisors

**FROM:** Tracy D. Strunk, Director, Department of Planning and Development *Tracy D. Strunk*  
Leslie B. Johnson, Zoning Administrator *Leslie B. Johnson*

**SUBJECT:** Staff update on Board Matter – High-pressure gas lines

On December 5, 2023, the Fairfax County Board of Supervisors (Board) directed the Department of Planning and Development (DPD) and other appropriate staff, including the County Attorney, to evaluate the following (Attachment 1):

1. Options to allow for Board evaluation of, or possible prohibition of, “high-pressure” gas lines within local street rights-of-way based on factors including location, size and type of pipe as well as other operational characteristics; and
2. Industry best practices related to the safety, installation, and location of such “high-pressure” gas lines.

To provide the Board with a thorough analysis and response, staff is conducting extensive research to understand the operational characteristics of natural gas distribution systems operating within Fairfax County and how such utilities are currently regulated at federal, state, and local levels. The topic is complex and highly technical, and research and analysis is ongoing. This update provides some initial background information and outlines the framework of the research and information gathering to formulate options that will be presented to the Board for direction and feedback at the May 14, 2024, Land Use Policy Committee.

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### RESEARCH FRAMEWORK

#### 1. Understanding the overall natural gas system and pipelines

Natural gas pipelines are used to carry natural gas across the following industry segments, from the point of production to end users:<sup>1</sup>

- **Production:** Taking raw natural gas from underground formations.

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<sup>1</sup> Environmental Protection Agency-Overview of the Oil and Natural Gas Industry: <https://www.epa.gov/natural-gas-star-program/overview-oil-and-natural-gas-industry>



- **Gathering and Processing:** Stripping out impurities and other hydrocarbons and fluids to produce pipeline-grade natural gas that meets specified tariffs (95-98 percent methane).
- **Transmission:** Delivery of natural gas from the wellhead and processing plant to city gate stations for distribution to consumers or industrial end users. Transmission occurs through a vast network of high-pressure pipelines.
- **Distribution:** Delivery of natural gas from the major pipelines to the end users (e.g., residential, commercial, and industrial customers).

Figure 1 shows segments of the natural gas industry system. Washington Gas and Columbia Gas are the local distribution operators in Fairfax County; they operate the city gates and everything downstream from that point until it passes through a customer meter. Other interstate gas companies, such as Colonial, TG Energy, Transco Williams, and others, operate the gathering and transmission lines.

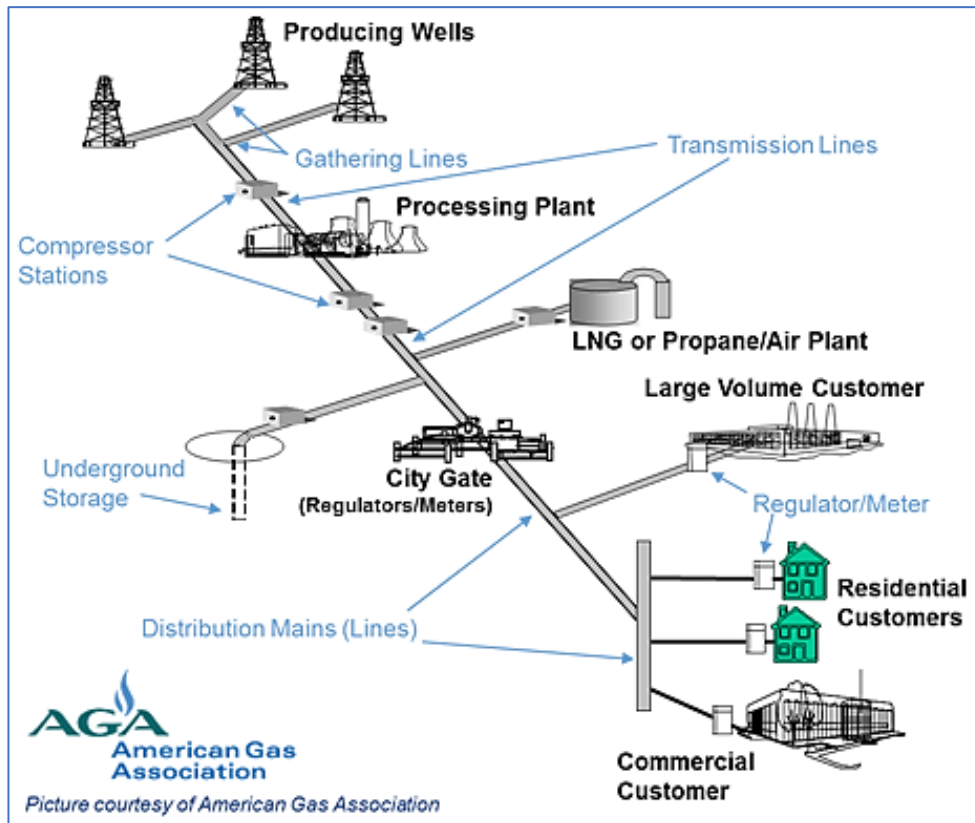


Figure 1: Natural Gas Distribution Diagram

The “city gate” is where a transmission system feeds into a lower-pressure distribution system, which delivers natural gas directly to homes and businesses. At the city gate, the pressure of the gas is reduced, the custody of the gas is transferred to the utility (meters it), and the gas is odorized<sup>2</sup>. Interstate transmission pipelines operate at pressures that may exceed 1000 pounds per square inch (psi), and local distribution systems operate at much

<sup>2</sup> Pipeline Safety Trust, Pipeline Briefing Paper #2: <https://pstrust.org/wp-content/uploads/2015/09/2015-PST-Briefing-Paper-02-NatGasBasics.pdf>

lower pressures (approximately at or below 450 psi<sup>3</sup>). In Fairfax County, the high-pressure distribution lines in the local distribution pipe network operate at greater than 60 psi, while pipes with less than 60 psi are referred to as medium-pressure lines. A house regulator in the building wall reduces the pressure down even further, depending on what the customer needs.

A **transmission line** is defined<sup>4</sup> as a pipeline, other than a gathering line, that: (1) transports gas from a gathering line or storage facility to a distribution center, storage facility, or large volume customer that is not down-stream from a distribution center; (2) operates at a hoop stress of 20 percent or more of SMYS; or (3) transports gas within a storage field. Local distribution companies may have transmission lines among their network of pipes when stress on a pipe exceeds 20 percent of SMYS.

#### What is SMYS?

For purposes of safety regulation for pipes, the principal criteria is not the pressure or the size of the pipe, but the amount of stress on the wall of the pipe (pressure) relative to the strength of the material or what is referred to in the industry as the **specified minimum yield strength (SMYS)**.

Once the gas is delivered to the local gas utility at the city gate, the utility must ensure that the gas reaches each customer with a sufficient flow rate and pressure to fuel equipment and appliances. The utility must maintain the pressure below the maximum allowable pressure for each pipe segment of the system. Regulators control the flow from higher to lower pressures as gas flows through the system.

## 2. Federal and state regulation of natural gas utilities

Washington Gas and Columbia Gas are subject to federal and state regulation. The federal pipeline safety regulations<sup>5</sup> establish minimum federal safety standards for pipeline transportation and pipeline facilities and allow oversight and enforcement to be delegated to a qualifying state agency. In Virginia, the State Corporation Commission (SCC) is designated by the U.S. Department of Transportation as the agency that enforces compliance with federal standards for pipeline facilities used for intrastate transportation. County staff met with SCC staff from the Division of Utility and Railroad Safety<sup>6</sup> which is charged with administering compliance with the safety standards. Through inspections of facilities, review of records and investigation of incidents, they ensure the pipelines meet the federal regulations and the gas companies own integrity management plans. The SCC considers the location of a pipeline when it approves a Certificate of Public Convenience and Necessity, except ordinary extensions or improvements in the usual course of business.

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<sup>3</sup> Columbia Gas has lines that have a maximum allowed operating pressure (MAOP) of 450 psi and Washington Gas has lines that have a MOAP of 325.

<sup>4</sup> Title 49 CFR, Part 192: <https://www.govinfo.gov/content/pkg/CFR-2022-title49-vol3/pdf/CFR-2022-title49-vol3-part192.pdf>

<sup>5</sup> Code of Federal Regulations Title 49, § 60101: <https://www.govinfo.gov/content/pkg/USCODE-2021-title49/pdf/USCODE-2021-title49-subtitleVIII-chap601-sec60101.pdf>

<sup>6</sup> State Corporation Commission, Utility & Railroad Safety, Pipeline Safety: <https://www.scc.virginia.gov/pages/Pipeline-Safety>

The safety requirements in the Code of Federal Regulations include standards that cover design, testing, construction, operation, maintenance, inspections—from project initiation through the pipeline’s lifetime. The regulations dictate design standards based on a proxy for population density of the area where a pipeline is constructed. There are four Class locations. A Class 1 location unit is defined as having ten or fewer buildings intended for human occupancy within 220 yards on either side of a 1-mile pipe segment. A Class 4 location is defined as areas where buildings with four or more stories above ground are prevalent within 220 yards on either side of a 1-mile pipe segment.

### 3. Washington Gas Strip 1 Tysons Replacement project

Washington Gas developed a "Tysons Strip One Replacement Gas Pipeline Project" to functionally replace an aging pipeline in this area. Installed in 1948, this segment of pipe is one of the oldest in their system. According to Washington Gas, it is constructing new infrastructure to improve the delivery, safety, and reliability of natural gas service for Fairfax County and its service area, which includes the District of Columbia and Maryland. The SCC also considers this project a safety enhancement, in the sense that the pressure of the existing pipeline would be reduced, while the new pipeline would carry high-pressure gas but in a new pipe capable of withstanding much greater pressures.

The Strip 1 Tysons project began in 2012, starting at Tyco Road, crossing the Capital Beltway, and is planned to connect to the existing Regulator Station located at the intersection of Pimmit Drive and Route 7 in Falls Church. The entire project spans approximately five miles in length (shown in Figure 2), mostly within public rights-of-way. One of the final phases (Phase 6) of the project calls for the installation of a 24-inch high-pressure (325 psi operating at 16 percent of the pipe’s limit or SMYS) gas line under Pimmit Drive. The Pimmit Drive line would run from the intersection of Route 7 and Pimmit Drive to the intersection of Pimmit Drive and Griffith Way (shown in Figure 3).<sup>7</sup> Pimmit Drive is classified as a local road within the residential single-family subdivision of Pimmit Hills.

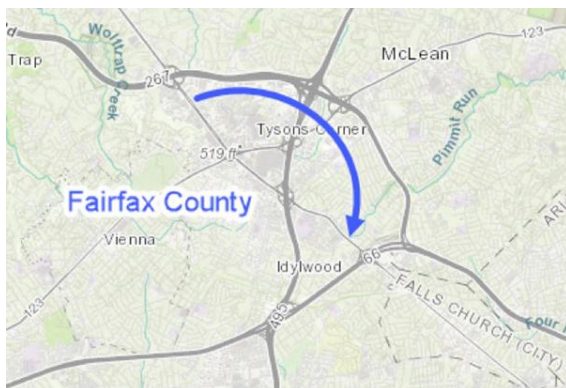


Figure 2: Tysons Strip 1 Project



Figure 3: Location of proposed pipe on Pimmit Drive (Phase 6)

<sup>7</sup> Washington Gas Strip 1 Tysons Project webpage FAQ: <https://www.wgstrip1tysons.com/faqs/>

#### **4. Understanding the natural gas utility systems that operate in Fairfax County**

County staff met with both Washington Gas and Columbia Gas representatives to better understand how their systems operate in the County and to discuss the impacts of potential approaches for regulating high-pressure pipelines under the County's Zoning Ordinance. The utility companies discussed information related to their infrastructure; construction methods; safety protocols; their planning and design processes; how they are regulated; and how their services would be impacted if certain pipelines were prohibited from local streets. Staff is synthesizing information provided during the meetings with Washington Gas and Columbia Gas, as well as the SCC, and will provide further information to the Board during its upcoming Land Use Policy Committee meeting scheduled for May 14.

#### **5. Jurisdictional comparison**

Staff has researched and met with other jurisdictions in Virginia and the region to understand how high-pressure natural gas lines are reviewed and regulated within each city or county's zoning ordinance. The Fairfax County Zoning Ordinance subsection 4102.4.X(3) currently exempts from regulation "[w]ires, cables, conduits, laterals, pipes, mains, valves or other similar equipment for the distribution to consumers of electricity, gas, or water, or the collection of sewage or surface water operated or maintained by a government entity or a public utility..., whether any such facility is located underground or above ground." This exemption allows for the regulation of facilities not related to the distribution of gas to consumers.

Based on review of each zoning ordinance, confirmation from jurisdiction staff, and to the best of our knowledge, none of the following jurisdictions have regulations prohibiting high-pressure gas lines within the public rights-of-way:

- Arlington County
- City of Charlottesville (operates local gas utility)
- City of Fairfax County
- City of Falls Church
- City of Virginia Beach
- City of Richmond (operates local natural gas utility)
- Henrico County
- Loudoun County
- City of Roanoke
- Washington, D.C.

In addition, the SCC, Washington Gas, and Columbia Gas all confirmed that they were not aware of any Virginia local zoning regulations that govern their underground pipelines in the public rights-of-way. They are regulated by the federal code.

## 6. Overview of Fairfax County’s “local roads” network

The Board directed staff to look at options for regulating or prohibiting high-pressure gas lines within local street rights-of-way. The Zoning Ordinance defines a “local street”<sup>8</sup> as a street which primarily provides direct access to residential, commercial, industrial, or other abutting property. The local street system includes any roadway not classified as a principal arterial, minor arterial, or collector street. A local street offers the lowest level of mobility and usually does not serve a bus route. Overall operating speeds are low in order to permit frequent stops or turning movements to be made with maximum safety. Through traffic, or vehicles which are passing through an area without originating or stopping there, are deliberately discouraged.

Fairfax County Department of Transportation (FCDOT) provided a map (Attachment 2) of the County’s Road network to show the locations of what it would consider local roads. While FCDOT doesn’t classify streets based on the Zoning Ordinance definition of “local street”, the map shows roads that are similar to the Zoning Ordinance definition that include two lanes, many driveways, are rarely widened at intersections, and almost always include stop signs. In discussions with Washington Gas and Columbia Gas, staff learned that there are currently high-pressure distribution lines that are located within roadways identified as “local” on this map and under the Zoning Ordinance. Attachment 3 is a high-level map that shows the existing Washington Gas transmission and high-pressure distribution pipelines.

## 7. Consultant services

DPD has issued a task order to engage subject matter experts to assist staff with the project. The consultant will assist staff by reviewing and summarizing the regulatory requirements related to construction of pipelines; assessing and confirming data and information requested and received from the County’s natural gas utility providers, the SCC and other jurisdictions; assisting staff in evaluating options on potential approaches; and providing data on how common it is nationwide to install high-pressure lines within residential areas’ rights-of-way.

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## NEXT STEPS

Staff anticipates returning to the LUPC on May 14, 2024, to present the topic, discuss potential approaches and obtain feedback from the Board. Questions and comments can be directed to Jacqui Kamp, Senior Planner, at [jacqueline.kamp@fairfaxcounty.gov](mailto:jacqueline.kamp@fairfaxcounty.gov) or 703-324-1314.

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## ATTACHMENT

1. December 5, 2023 Board Matter
2. Fairfax County “local road” network map
3. Washington Gas Light Assets and Suppliers map (Existing WGL transmission and high-pressure distribution pipelines)

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<sup>8</sup> Fairfax County Zoning Ordinance definition of local street: <https://online.encodeplus.com/regs/fairfaxcounty-va/doc-viewer.aspx#secid-2421>



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**JOHN W. FOUST**  
DRANESVILLE DISTRICT SUPERVISOR

## **Board Matter**

**Chairman McKay, Supervisor Foust,  
Supervisor Palchik and Supervisor Smith  
December 5, 2023**

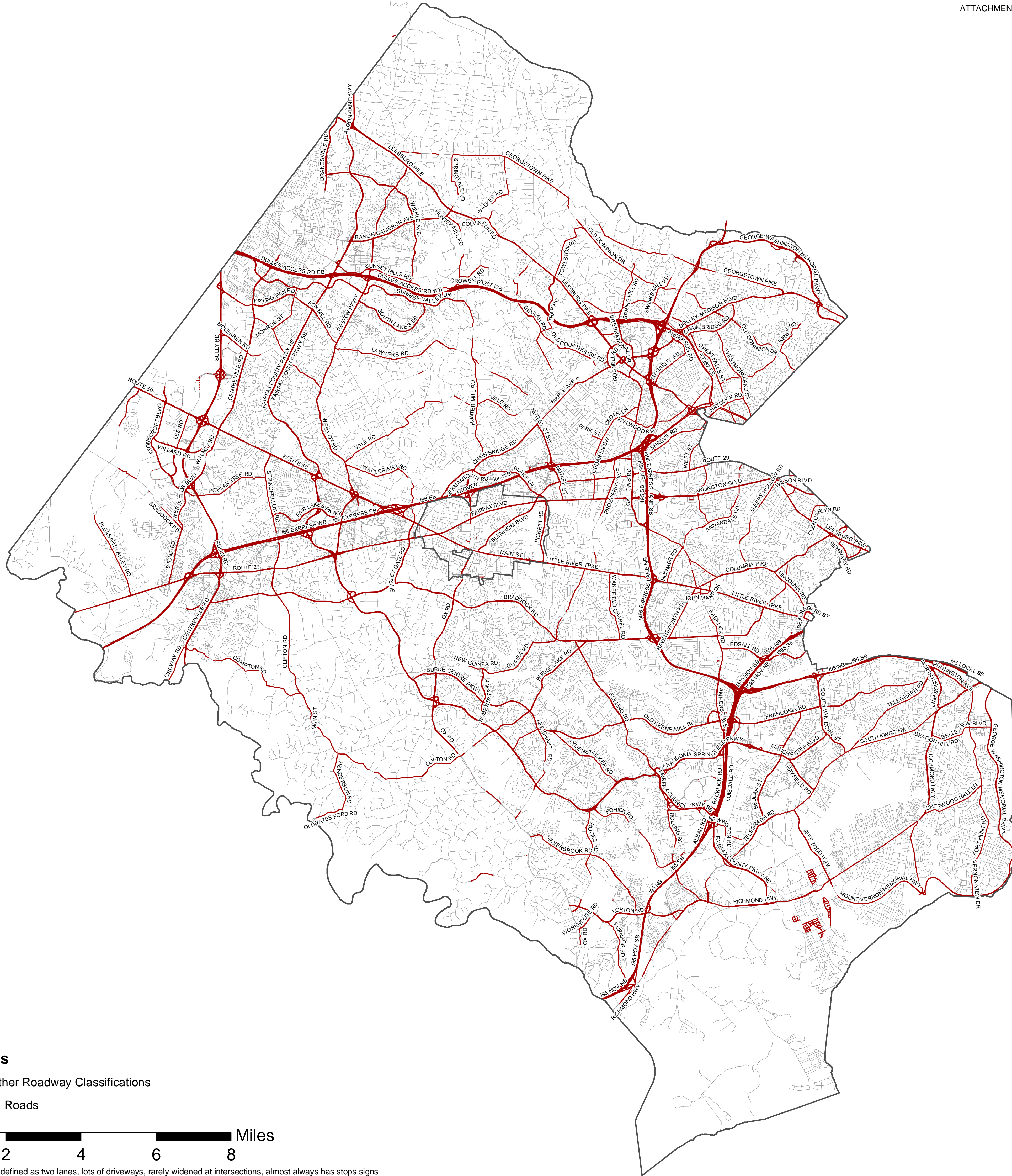
### **“High Pressure” Gas Lines**

**Background:** Mr. Chairman, residents have expressed concern regarding the potential installation of “high pressure” gas lines underneath local residential streets. “High-pressure” gas lines are a component of an overall system, but do not directly provide gas service to the adjacent residences. The residents have questioned the safety and need for this type of line to be located under a local residential street, citing concerns about a higher risk for gas leaks and related hazards in the event of a rupture due to construction activities within proximity of the line.

With regard to utility facilities located in a street right-of-way, Zoning Ordinance Subsection 4102.4.X(3) currently exempts from regulation “[w]ires, cables, conduits, laterals, pipes, mains, valves or other similar equipment for the distribution to consumers of electricity, gas, or water, or the collection of sewage or surface water operated or maintained by a government entity or a public utility..., whether any such facility is located underground or above ground.”

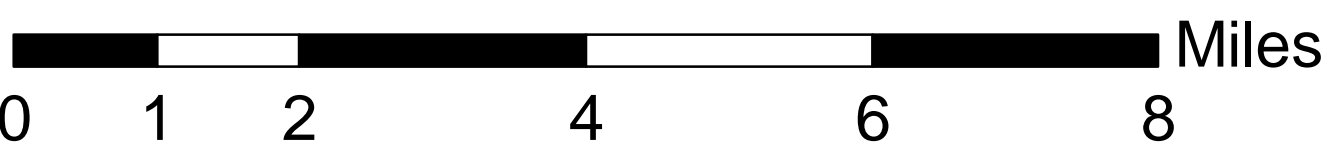
While underground pipes, mains and conduits can be located both above and below ground throughout the County and are critical to the provision of necessary utilities to residents and businesses in Fairfax County, “high-pressure” gas lines could have a greater potential for damage to life and property in the event of a rupture than other types of utilities such as water, sewage, or electricity.

**Motion:** Therefore, we move that the Board direct the Department of Planning and Development, and other appropriate staff, including the County Attorney, to evaluate: (1) options to allow for Board evaluation of, or possible prohibition of, “high-pressure” gas lines within local street rights-of-way based on factors including location, size and type of pipe as well as other operational characteristics; and (2) industry best practices related to the safety, installation and location of such “high- pressure” gas lines. We further move that staff return to the Board in March 2024 to present their findings and recommendations to the Board’s Land Use Policy Committee.



**Roadways**

- All Other Roadway Classifications
- Local Roads



NOTE: Local Roads defined as two lanes, lots of driveways, rarely widened at intersections, almost always has stops signs



# Washington Gas Light Assets and Suppliers

Scale: 1:500,000

