

# Report

## Land Use Planning In Proximity to Natural Gas and Hazardous Liquid Transmission Pipelines in Washington State

June 2006

**Final**

# LAND USE PLANNING IN PROXIMITY TO NATURAL GAS AND HAZARDOUS LIQUID TRANSMISSION PIPELINES

## FOREWORD

Natural gas or hazardous liquid transmission pipelines run through 28 Washington counties and 119 cities. They lie buried at varying depths, carrying a range of volatile products and cross through a variety of land uses --from agriculture to urban centers.

The presence of a major pipeline forms a relationship between the pipeline operator, safety regulators, local government, property owners and developers. How this relationship is managed can affect directly the safe operation of the pipeline and consequently the public health and safety of the surrounding community.

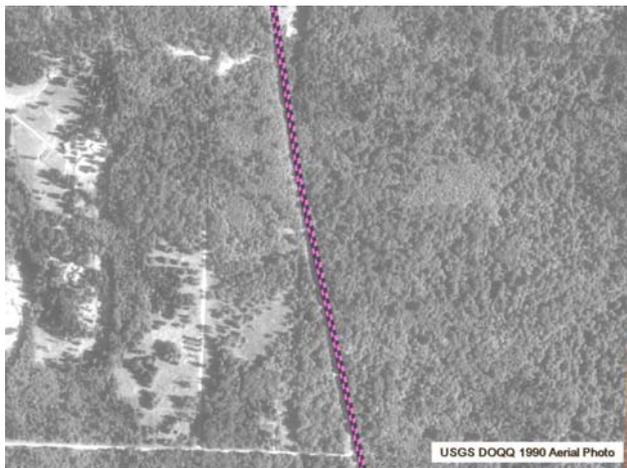
- Pipeline operators are required under federal and state law to adopt and follow safety procedures for maintenance and operation of their pipeline.
- The federal Office of Pipeline Safety and the Washington Utilities and Transportation Commission pipeline safety program monitor and enforce these safety regulations.
- Property owners with easements held by pipeline operators must abide by the easement agreement.
- Developers, along with everyone else, have an obligation under state law to contact the 'one-call' utility locating service before any excavation.
- Local governments may have franchise agreements with pipeline operators. They also issue permits for work the operator may need to do in the community.

None of these relationships, however, speaks directly to managing land use activities which can contribute to the occurrence of a pipeline incident and the exposure to harm of those living and working near a pipeline in the event of an incident. While pipeline safety involves a great many components and players, the procedural processes used to review proposed land use actions are the one area in which local governments can exert the most influence in protecting health and safety of its citizens.

Incidents involving hazardous liquid and transmission natural gas pipelines are rare but unfortunately do occur. These incidents can have a deadly and damaging effect as happened in Whatcom Creek when three young people were killed as a result of a petroleum pipeline leak. There have been nine other incidents involving hazardous liquid and natural gas transmission pipelines in Washington since the 1999 incident. While these more recent incidents did not result in injury or death, they caused roughly \$2.5 million in damage. Several of the incidents could have caused injury had they occurred in more densely populated areas.

Most of the over 3,200 miles of transmission pipelines in Washington were constructed in farmland bypassing urban areas. However, to accommodate population and economic growth,

land areas once considered rural are being absorbed into expanding urban growth areas and developed to urban uses. Nine of the state's 10 fastest growing counties are home to almost half of the state's major pipeline mileage. This growth means more and more people are working and living near major pipelines. Increases in population and land use activity expand the risks of pipeline damage and raise the stakes in the event of a pipeline incident. The pictures in Figures 1 and 2 below were taken of the same area in Washington State – 12 years apart.



**Figure 1 - 1990**



**Figure 2 - 2002**

Pipeline safety and environmental regulations have generally focused on the design, operation and maintenance of pipelines and incident response. They have not directed significant attention to the manner in which land use decisions in proximity to pipelines can affect public health and safety.

In 2004 and 2005, a group of city, county, state and industry representatives conducted a series of workshops throughout the state for local government officials, particularly staff from the planning, permitting and public works sections. The purpose of these workshops was to exchange ideas and explore the range of tools available to manage and make effective decisions concerning land use in proximity to transmission pipelines.

No "silver bullet" was found which can satisfy all the needs of our state's diverse set of communities. However, a common theme emerged along with a range of tools which can help local governments take an active role in pipeline safety. The common theme is straightforward but not necessarily easy: communication. More specifically, there is a demonstrated need to ensure that land use decisions and land development activities occurring within the vicinity of transmission pipelines are informed by early (i.e., pre-planning) consultation with pipeline operators, local government and developers.

Effective communication can result in decisions which reduce the probabilities and consequences of transmission pipeline incidents.

## **Who should read this report?**

This report is for local government decision-makers and administrators, especially those involved in land use planning and permitting. However, all parties affected by land use adjacent to pipelines should review this report. They include:

- Planners
- Elected and appointed officials
- Pipeline Operators
- Developers & Builders
- Public Works Directors
- Design professionals
- Emergency Management Department managers
- Health departments
- Community organizations
- Property owners

## **What's in and not in this report**

This report is focused on land use in proximity to existing pipelines. The appendices and reference documents associated with this report deal with the details of many of the issues and provide some thoughts on options that can be used in managing the relationships among stakeholders.

This report does not deal with issues related to the siting of new hazardous liquid and natural gas transmission pipelines though the principles of effective communication apply in siting as well. It also does not address the network of small-diameter natural gas distribution lines which serve individual customers.

*Additional information can be found in Special Report 281 of the Transportation Research Board,  
"Transmission Pipelines and Land Use: A Risk Informed Approach" 2004*

## **Contributors to this report**

This report is the result of a collaborative effort between state and local governments and the pipeline industry. The information contained within has been shared and discussed in stakeholders groups across the state. The consultation process was the subject of a series of five workshops with local governments in November 2005.

Sponsors of this initiative are:

- The Washington Utilities and Transportation Commission Pipeline Safety Program
- Municipal Research and Services Center
- Association of Washington Cities
- Washington State Association of Counties
- Pipeline Safety Trust

## **EARLY COMMUNICATION: AN EMPHASIS ON CONSULTATION**

As population grows and land becomes scarce, pressure increases for development of remaining open land. Planning and building departments have to juggle competing interests in a time-pressured environment when making their decisions. As with any involved process, the sooner land use issues are addressed the more effectively they can be resolved. For instance, a subdivision design which places a water retention pond precariously adjacent to a transmission pipeline will be hard to correct at a time when final permits are being issued. One answer is early consultation between planners, pipeline operators and developers.

Consultation can be as basic as ensuring that affected pipeline operators are aware of a proposed change in zoning or comprehensive plan to greater involvement such as requiring review and comment by pipeline operators for certain types of developments located adjacent to or near pipeline rights-of-way.

For consultation to be effective, all parties need to understand the following:

1. Location and type of major pipelines
2. Types of land use activities and developments of concern
3. Options for fostering and/or enforcing consultation
4. Roles & responsibilities

### **1. Awareness of location and type of pipeline**

Understanding the existence and location of hazardous liquid and natural gas transmission pipelines within a community is essential to protecting public health and safety. The communication required here is primarily between local government and the pipeline operator. Local government can foster this greater awareness by ensuring that all their maps, particularly those used for planning and building departments, indicate the location of all transmission pipelines.

The Washington UTC pipeline safety program can provide local governments with pipeline location data, in a form that is most useful to them. The pipeline safety program also can assist local governments in learning about the types and characteristics of the pipelines running through their jurisdiction as well as how to contact the operators.



**Figure 3 – Subdivision with Pipeline Location**

Planners should overlay the pipeline maps with their zoning maps and consider whether any action should be proactively taken. Consulting with the pipeline operator can help educate planners about the pipeline’s contents, volatility, pipe pressure, depth and other characteristics. In doing so, planners can develop a better understanding of the consequences associated with a pipeline leak or rupture and determine the range of influence of the pipeline. For instance, a high-pressure natural gas pipeline rupture will have a range or zone of consequence that goes significantly beyond the pipeline’s right-of-way.

A petroleum pipeline release also can affect an area wider than its right-of-way but the size and direction of the spill will be influenced by the topography.

Pipeline operators are obligated under new federal requirements to communicate with local governments on a wide range of issues, including the effect of land use measures on pipeline safety. However, the requirement mandates a schedule of communication that is likely not frequent enough to sustain the type of relationship necessary to build awareness. Local governments may want to institute a more formal way to maintain routine communication and consultation with operators. In particular, this communication should be timed to enlist operator participation in key decisions affecting land use in the vicinity of the pipeline.

*See Appendix A for additional information on pipeline regulators and pipeline locations in Washington*

## **2. Types of land use activities and developments of concern**

There are two ways to view land use and developments in relation to pipelines.

- Activities that can threaten the integrity of the pipeline
- Activities that can increase the consequence to the public in the event of an incident.

Activities of greatest threat to the pipeline are those that occur within the pipeline's right-of-way. The communication here is primarily between the pipeline operator and the property owner. These activities should be governed by an easement negotiated with individual property owners. The easement is held by the operator and includes the right to operate, maintain and repair the pipeline. These easements may not always be well defined but they should be recorded with the deed. While pipeline operators can always use assistance in educating landowners and identifying when easement rights are being violated, the job of enforcing easements rests with the operator.



**Figure 4 – Fence on pipeline easement**

*See Appendix B for additional discussion of Right of Way and easements*

In areas adjacent to or near the pipeline right-of-way, the types of activities that threaten the pipeline are those which can cause soil instability, through vibration, earth removal, water runoff or dewatering. These activities include:



**Figure 5 – Retention pond near easement**

- Land subdivision
- Commercial developments
- Water impoundments
- Public works projects such as roads & sewers
- Industrial activities such as quarrying, mining, and blasting.

Local government planners should require consultation with the pipeline operator early in the planning process before such activities are allowed.

Just as human activity can pose a risk to pipelines, a transmission pipeline can pose a risk to its surroundings. For example, a catastrophic failure of a high-pressure natural gas transmission pipeline could cause injury to people 100 feet or more away and the largest and highest pressure natural gas pipelines can cause injury out to 1,000 feet. This does not mean that no one should be allowed within 1,000 feet of a high-pressure pipeline. It does mean that careful thought should be given to how land adjacent to pipelines should be used.

When zoning land near pipelines, planners should consider the types of land uses which can limit the potential consequences of an incident. For instance, a local jurisdiction may decide to discourage construction of facilities which may be difficult to evacuate such as a high-rise development or nursing home. Similarly, siting emergency response services, such as fire stations and hospitals, should be avoided near pipelines. Zoning of areas near pipelines should favor lower density developments such as agriculture, industry, warehouse and single family housing.

While the focus of regulators and pipeline operators should be on assuring that pipelines are maintained and operated so that they do not rupture or leak, local governments play a vital role in public safety by making land use decisions which can limit the possibility and consequence of a pipeline rupture or leak.

### **3. Options for fostering and enforcing consultation**

The main objective of fostering consultation in land use planning is to limit the possibility and consequence of a pipeline incident—an objective which all parties involved in land use and development should share. However, to avoid conflicts between safety and property rights, the consultation process should begin at the earliest possible opportunity. Local jurisdictions with major pipelines running through their communities should consider employing the following options:

- 1) Include pipeline location on all zoning, building and public works maps
- 2) Request pipeline operator input in any comprehensive plan amendments or rezone
- 3) Require subdivision plans to be reviewed by affected pipeline operators
- 4) Include pipelines as part of the local jurisdiction's State Environmental Protection Act (SEPA) checklist
- 5) Require proof of utility locate call before issuing building/grading permits for parcels within some locally designated distance from the pipeline
- 6) Establish setbacks and modify site and building code specifications

Regarding setbacks, there is no analysis available to local governments which would allow them to establish standards beyond current practice. There is an effort on the national level, sponsored by the federal Office of Pipeline Safety, to consider establishing recommended practices and procedures for local governments which could provide a foundation for establishing setbacks. Such procedures, if done as planned, would be based on the expected risk at various distances from transmission pipelines depending on product type, pressurization and so forth. Since this tool will not be available in the near future, it's the recommendation of the report writers that local government devote their efforts more toward fostering consultation.

*See Appendix C for additional discussion of communications and management options for land use in proximity to pipelines.*

#### **4. Stakeholder roles & responsibilities**

Planners and developers need to be prepared to consult with operators of nearby major pipelines who, in turn, must be easily accessible and prompt in their review and comment. During consultation, both developers and pipeline operators may need to consider changing their plans or operations to accommodate one another and to address public safety concerns. Local government's role, as always, is to protect the health and safety of its citizens, which in this case includes ensuring that such consultation occurs when necessary.

**Every stakeholder** must be responsible for the following:

- a. Understand and make available accurate pipeline information, including pipeline location;
- b. Understand land use planning issues and processes;
- c. Initiate and sustain communication with other stakeholders early in any project;
- d. Awareness of existing site area conditions e.g., hydro-geologic, infrastructure

**Local authorities** have the following responsibilities:

- a. Implement land use controls that recognize and preserve the right-of-way; and
- b. Use ministerial or discretionary permit authority to ensure consultation between developer and pipeline operators.

**Property owners and developers** have the following responsibilities:

- a. Involve pipeline operator in early design;
- b. Design and construct consistent with safe pipeline operation.

**Pipeline operators** have the following responsibilities:

- a. Easy access to local governments and developers;
- b. Prompt review and comment on any land use decision or development design;
- c. Inclusion in planning authority notification processes regarding development by providing local government with up-to-date contact information; and
- d. Regular communication with local authorities about the importance of pipeline awareness and changes in operating characteristics such as pressure changes.

#### **APPENDICES**

- A. Pipeline Operators and Areas Served, Pipeline Contacts, Pipeline Regulators,
- B. Right of Way and Easements
- C. Options for Communications and Management of Land Use in Proximity to Pipelines
- D. Pipeline Resources
- E. Pipeline Typology and Glossary
- F. Acknowledgements