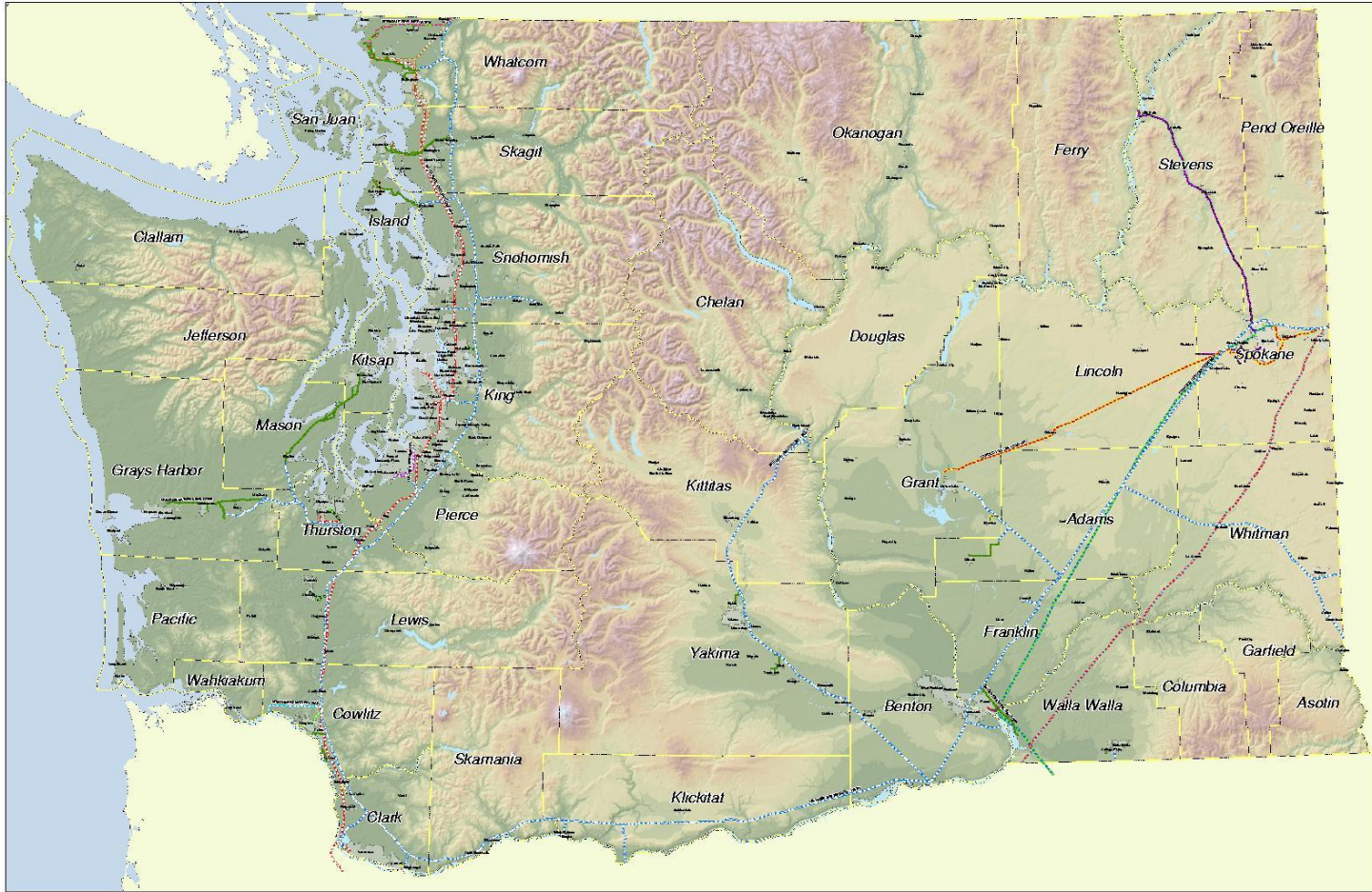


Washington Utilities & Transportation Commission

Pipeline Safety

Geographic Information System (GIS)



<p>Scale: 1:500,000</p>	<p>PIPELINES</p> <ul style="list-style-type: none"> AWRITA UTILITIES CORPORATION BASIN FOODS, INC. BP-CLINTON PIPELINE COMPANY CARCA DE NATURAL GAS CO RP CHEYRON PIPELINE COMPANY CONOCO PIPELINE COMPANY EBERHARDT ALUMINUM LLC FERRIS PIPELINE SYSTEM GEORGIA PACIFIC CORPORATION KANES PIPELINE COMPANY NEVAL AIR SYSTEM - WHISKEY ISLAND NOCTWAY BT NATURAL GAS POUL G. GAS TRANSMISSION NORTHWEST PUGET SOUND ENERGY SUMAS COGENERATION COMPANY L.P. TIDWATER BARGE LINES TIMBERLAKE PIPELINE OIL CO RP 	<p>OTHER FEATURES</p> <ul style="list-style-type: none"> City Boundary County Boundary 	<p>Washington State Hazardous Liquid, Natural Gas Pipelines (Over 200 gal)</p> <p>Created By: Takahito Aso</p> <p>Sheet: Ken Effer</p> <p>Date: 2008/09</p>
	<p>PIPELINES</p> <ul style="list-style-type: none"> U.S. OIL & REFINING CO. Weyerhaeuser Paper Company WILLAMETTE GAS PIPELINE - WEST 		

Establishment of the Utilities and Transportation Commission Pipeline GIS

In 2000, following the Bellingham pipeline incident, the WA State Legislature passed the Pipeline Safety Act (Chapter 81.88 RCW).

This legislation required the Utilities and Transportation Commission (UTC), Pipeline Safety Section to develop and implement a comprehensive pipeline safety program for gas and hazardous liquid pipelines including **mapping of pipeline locations**.



The legislation specifically mandates that the UTC collect information from the pipeline operators “Sufficient to meet the needs of the First Responders, and **to provide pipeline information and maps to local governments**”.

UTC Pipeline Safety GIS Program Status

Pipeline Safety GIS staff:

- **Have been collecting pipeline information and combining it into a GIS**
- **Have verified the positional accuracy of pipeline facilities to ensure quality GIS data**
- **Created a variety of products for first responders, state/local government and internal use such as pipeline map atlases, pipeline GIS data, and mobile GIS data viewers.**
- **Supports its inspection program with detailed pipeline analysis and mapping products**

Positional Accuracy



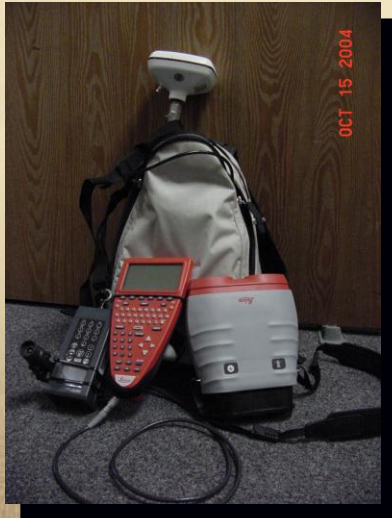
- **Feedback from local emergency responders and our state partners which has indicated that a printed product standard of +/- 40 feet at a scale of 1 :24,000 for rural areas, and non-scale dependent accuracy down to +/- 10 feet in urbanized areas are adequate.**
- **The positional accuracy requirement of +/- 500 feet at 1:24,000 under the NPMS standards caused some concern with several local government users, and brought up unanswered usability questions.**

Data Collection, Processing & Adjustment

GIS staff verify pipeline location data submissions by:



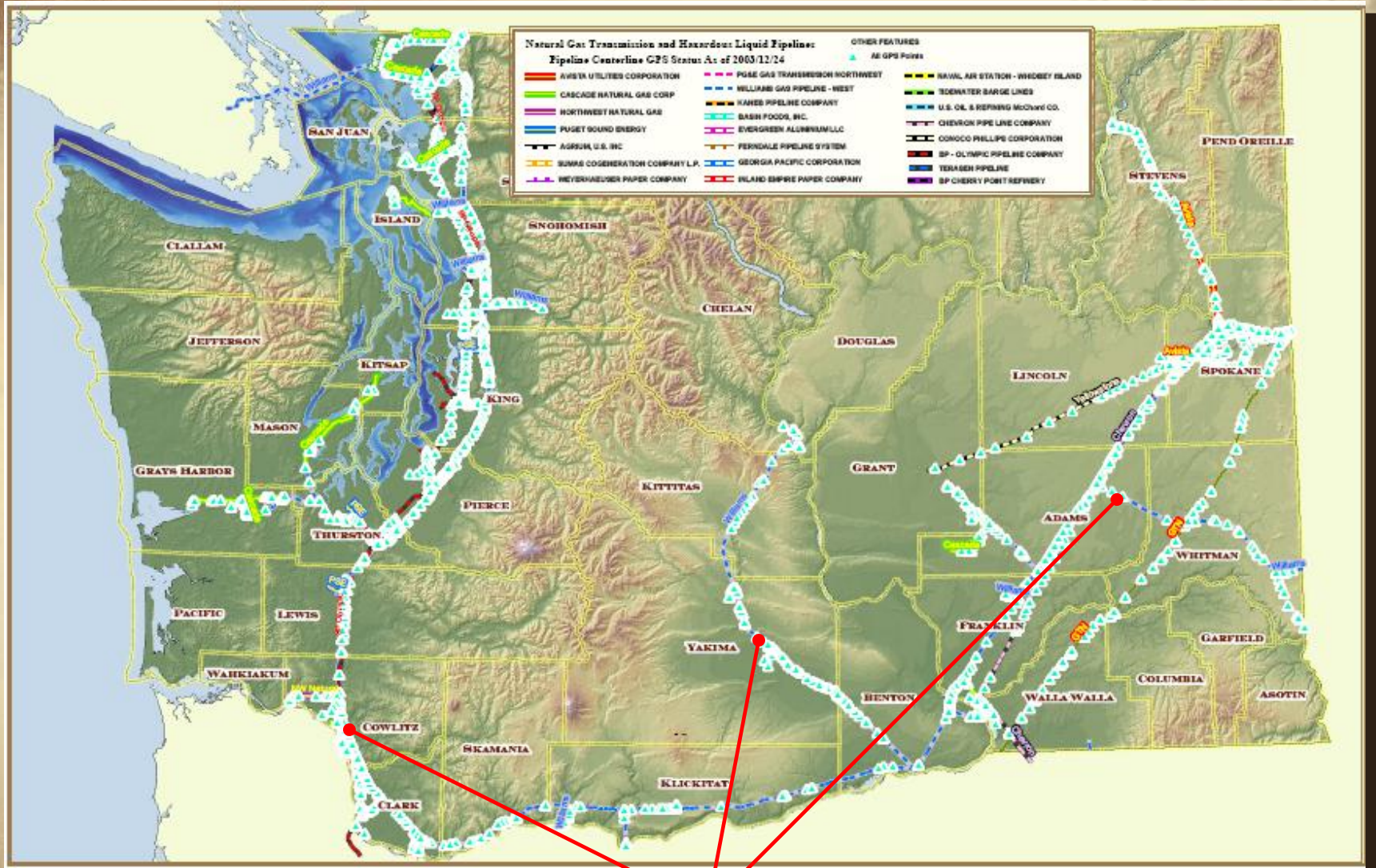
**Multiple pipelines and utilities
in the same right-of-way**



GPS and range-finding equipment

- **Evaluating the source and the lineage of the data in question through discussion with the data provider or metadata research**
- **Collecting pipeline features in the field**
- **Using aerial and orthophotos for data adjustment in areas that cannot be physically accessed**
- **Collecting and processing data obtained from in-line inspection (ILI) tools that incorporate GPS and Inertial Navigation System (INS) technology**
- **Setting an accuracy goal that is consistent with the National Map Accuracy Standard (NMAS) for our printed products.**

Pipeline GPS QA/QC Check Points



GPS points are collected to verify data submissions and collect GIS data for pipelines systems that had no existing spatial data.

GIS staff take extra GPS points in urban areas to increase the accuracy of pipeline locations.



UTC Additional Intrastate Centerline Attributes

DISTRICT = District

INST _DATE= Installation date

WALL _THICK = Wall thickness

GRADE = Grade

SEAM = Type of seam

PRE70ERW =Percent ofPre-1970 ERW pipe

PIPE_MANU = Pipe manufacturer

COATING_TYPE =Coating type

CP_SYS = Cathodic protection system

MAOP = Maximum Allowable Operating Pressure

MOP= Maximum Operating Pressure (Liquids Only)

WKP = Working Pressure

PS_MAOP =Percent SMYS at MAOP

UTC Additional Intrastate Centerline Attributes

MARKET = End markets

LEAK_DETECT =Leak detection type and capabilities

OPRES_PROTECT = Type of overpressure protection

VALVE_TYPE = Type of valve operators (manual, pneumatic, electric, .etc)

CLASS3_PERCENT =Percent of pipeline mileage in Class Three locations

CLASS4_PERCENT =Percent of pipeline mileage in Class Four locations

USA= Any areas considered to be unusually sensitive by the operator

HYDROTEST = Hydrostatic pressure test information

INT_INSPECTION= Internal inspection information (type of tool)

FAILURE_HIST =Failure history, include releases, leaks, and overpressure.

SLIDE_ZONES = Identify the length of pipeline located in slide zones.

MAX_FLOW = Identify Maximum flow rates.

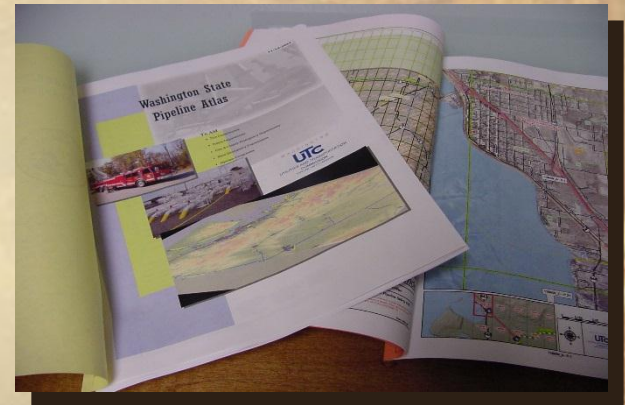
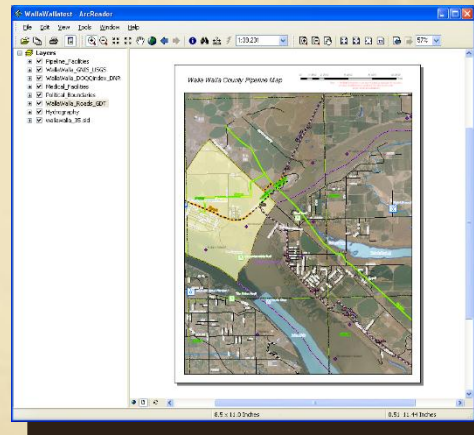
CONTACT= Company contact person

NOTES = Any additional information

Product Availability

Available products:

- Pipeline Map Atlases
- Adobe PDF Pipeline Atlas
- General GIS Data
- Pipeline GPS Points
- Pipeline Centerlines
- Site Specific Cartographic Products

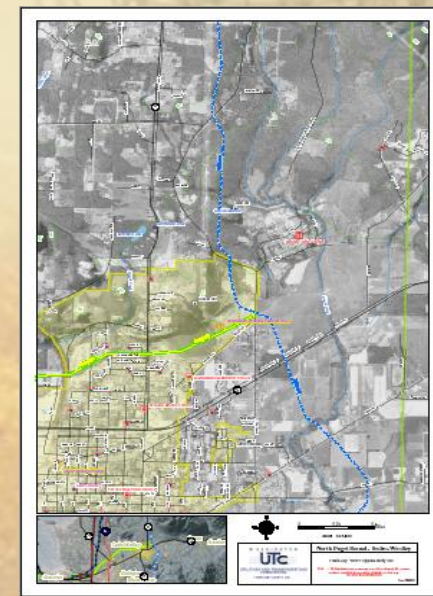


(Some products listed above will require certain hardware and software)

Samples of External GIS Support

The UTC provides pipeline GIS data to first responders, locators, and state/local government. They use pipeline GIS data for the following tasks.

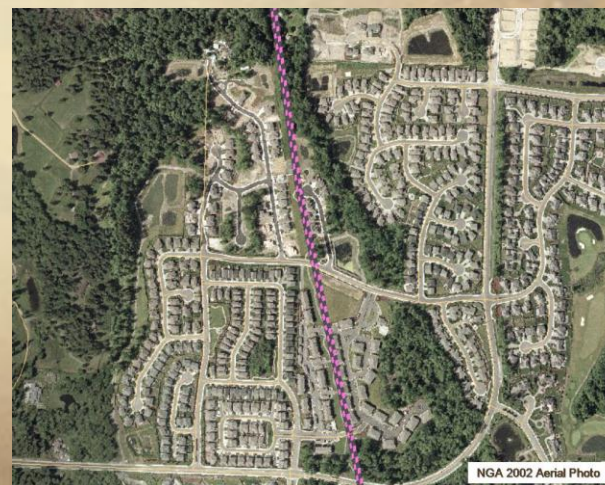
- Analysis using pipeline data with local GIS data
- Land Use/Encroachment Planning
- Environmental Studies
- Incident Command Systems (ICS)
- Community Outreach
- One Call Systems and Locating
- Hazard Mitigation Planning.



City annexation near pipeline centerline



Same Location
12yr difference

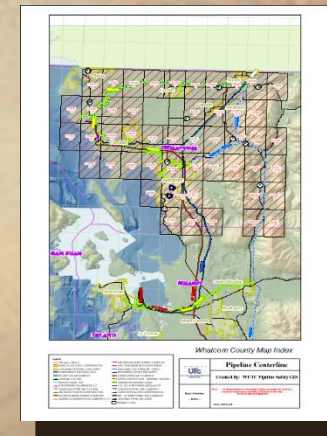
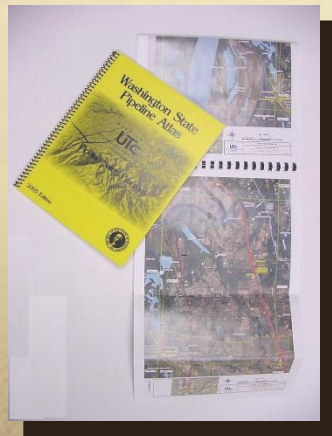


Pipeline Map Atlas

Map books can quickly inform a user where oil and gas pipelines are located, what's around the pipeline, and help support more informed initial assessments for planning purposes or during a pipeline incident.

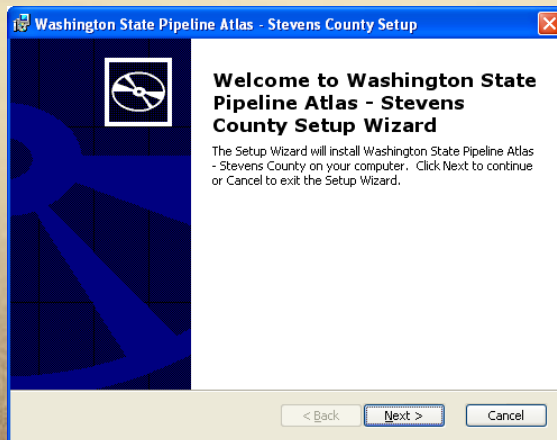
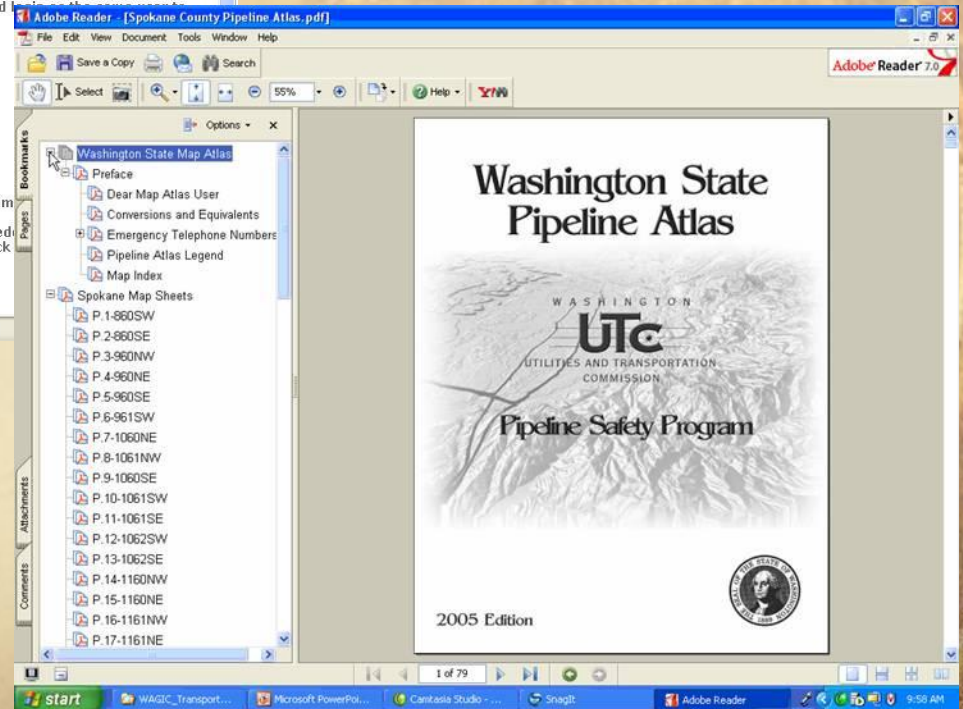
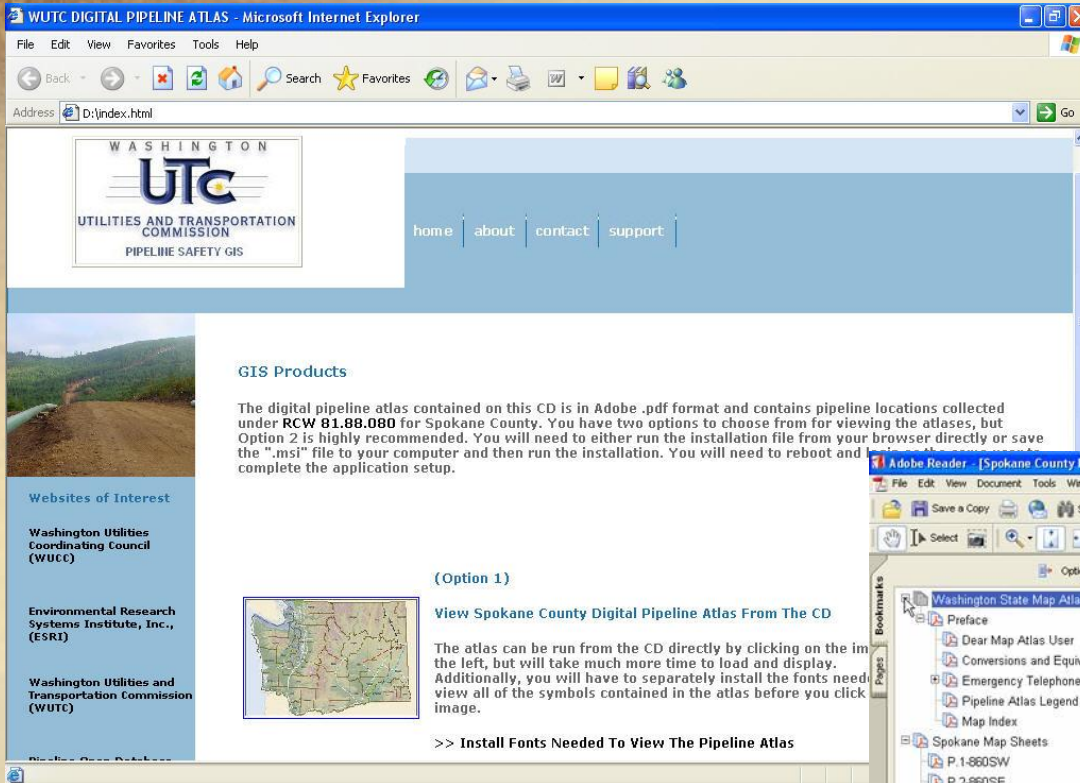
Pipeline Map Atlas Specifications

- 8 ½ x 11” Rugged plastic cover with waterproof map sheets
- Areas divided by counties
- Distributed to fire districts and local governments near pipelines



Pipeline Atlas Viewer

This product is very basic and can run on virtually any computer that has a web browser and Adobe Acrobat Reader.



Pipeline Atlases on the Web

The UTC also provides maps for 29 counties as part of a demonstration project. These maps do not include the aerial photography and key locations that the fire department atlases have but they do have sufficient detail to determine where you live and work in relation to a hazardous liquid pipeline or high-pressure natural gas pipeline.

The screenshot shows the main interface of the UTC Pipeline Maps web application. The header includes the UTC logo and navigation links for 'File a Complaint', 'Submit a Comment', and 'Request Records'. The main navigation menu includes 'Home', 'Consumers', 'Regulated Industries' (highlighted), 'Public Safety', 'Documents and Proceedings', 'About Us', and 'Contact Us'. A left sidebar contains a tree view for 'Utilities' and 'Transportation'. The main content area is titled 'Pipeline Maps' and includes a 'CALL BEFORE YOU DIG' section with a 'Request Underground Utility Locate' button. Below this is a paragraph explaining the map viewer's scale and a table of 29 counties. At the bottom, there is a disclaimer and social media sharing options.

WASHINGTON
UTC
UTILITIES AND TRANSPORTATION COMMISSION

Home Consumers **Regulated Industries** Public Safety Documents and Proceedings About Us Contact Us

Utilities
Energy
Telecommunications
Water
Transportation
Auto Transportation and Buses
Charter and Excursion Buses
Commercial Ferries
Common Carriers
Freight Brokers
Household Goods Carriers
Low-Level Radioactive Waste
Non-Profit Buses
Pipeline
Railroads
Solid Waste Carriers

Home > **Regulated Industries** > Transportation > Pipeline > Pipeline Maps

Pipeline Maps

Welcome to the UTC's Pipeline Safety Map Viewer.

CALL BEFORE YOU DIG

Request Underground Utility Locate

About Call Before You Dig

Please note that the viewer limits the scale of pipeline maps, in accordance with the National Pipeline Mapping System (NPMS) security policy. Pipeline features will not display when the viewer is zoomed in closer than a 1:24,000 scale (approximately 0.2 miles on the scale bar).

To view the pipeline routes, select a county below.

Adams	Island	Skamania
Asotin	King	Snohomish
Benton	Kitsap	Spokane
Chelan	Kittitas	Stevens
Clark	Klickitat	Thurston
Columbia	Lewis	Walla Walla
Cowlitz	Lincoln	Whatcom
Franklin	Mason	Whitman
Grant	Pierce	Yakima
Grays Harbor	Skagit	

Information displayed on these maps is for general purpose only and does not provide accurate information for locating the pipeline, or other utilities such as power cable or lower pressure gas distribution pipelines. The data provided should never be used as a substitute for calling 811 prior to excavation activities. Please call 811 before any digging occurs.

Share | Facebook | Twitter | YouTube | LinkedIn

This screenshot shows a zoomed-in view of the pipeline map for Thurston County, Washington. The map displays various pipeline routes in red and blue, overlaid on a topographic map. A legend on the left side of the map viewer includes options for 'Expand-To-View-Pipeline-By-County-TH', 'Pipelines', 'City Boundaries', 'County Boundaries', and 'Basemap'. A scale bar at the bottom indicates a scale of 1:425,036. The map shows major cities like Olympia and Lacey, and the coastline of the Pacific Ocean.

WASHINGTON STATE PIPELINE-THURSTON COUNTY

Map Contents

Note: The viewer limits the scale of pipeline information to 1:24,000 scale (approximately 0.2 miles on the scalebar). Pipelines will not display if the viewer is zoomed in closer than this.

- Expand-To-View-Pipeline-By-County-TH
- Pipelines
- City Boundaries
- County Boundaries
- Basemap

1:425,036

0 1 2 3 4 5 Miles

Copyright

Mobile Mapping Application

We have developed a mobile mapping project for use by our pipeline inspectors to collect GIS information & useful inspection notes.

The screenshot displays the DeLorme XMap 7 Professional interface. The main map area shows a topographic map with various GIS layers overlaid, including a yellow line representing a pipeline route. Numerous text annotations are present on the map, such as "Road closed on the 10/3/13 due to grading", "Active Slide", "Dead End", "CP test stations", "No trespassing", "lab class 2 maybe 3", "Yep HCA ultra hilly houses and drains to Cowlitz", "River-Xing Weyco 4-9-14", "HCA CA Cowlitz", "Campfire on ROW ultra hilly CA topog", and "Could not take good picture - too much traffic".

In the bottom-left corner, a photo window shows a photograph of a large pipeline running through a grassy field. The photo window title is "http://home.utc.wa.gov/sites/PipelinePrivate/Adm...".

The bottom-right corner features a legend titled "Primary Map" with the following items:

- Draw Files
- Master_Observation_File
- Metering
- Regulator
- Slides
- Span
- Valves
- Wapoint1.svar?

The interface also includes a toolbar with various navigation and editing tools, a status bar at the bottom, and a small inset map in the bottom-right corner showing the current location within a larger regional context.

What's Next.....

- **Continue supporting first responders, state/local government with pipeline GIS products**
- **Refine pipeline GIS data collection methods**
- **Leverage ArcGIS Server and ArcGIS Online capabilities**
- **Continue development of our inspection and reporting applications**