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Invisible Infrastructure

How Data Gaps Undermine Housing and Growth Policy in Washington

A Building Industry of Washington Report

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Contents

Background

Many Washingtonians remember Bertha. The largest tunnel-boring machine ever built, Bertha came to Washington in 2013 as part of the $3.1 billion project to replace Seattle's iconic, but earthquake-prone, SR 99 Alaskan Way Viaduct with a deep downtown tunnel. It was the single most expensive infrastructure project ever to be completed in Washington.

Bertha had an almost mythical quality to her. She wasn't just built to save Seattle traffic – she had "13 times the power of a space shuttle's engines," and was "big enough to swallow the second-largest boring machine." Bertha even had her own Twitter account, run by the Washington State Department of Transportation (WSDOT).

So, who defeated Bertha? Who gave us the silence that stalled her engines? The answer: An unmapped, unknown 119-foot steel well casing buried deep underground.

For days, the pipe jammed gears and slowed progress as the crews pushed forward to avoid delays. This led to catastrophic failure and overheating, stalling the project for over two years and requiring a massive rescue operation.

Bertha's defeat showed how even the most well-funded projects can be derailed. One unmapped and forgotten steel pipe brought a $3.1 billion plan to a halt. Though Bertha eventually resumed her work, the incident revealed a larger issue: fragmented knowledge of Washington's underground infrastructure systems. Across the state, developers, planners and legislators face similar blind spots—not necessarily with tunnel machines, but with water pressure and sewer capacity. As Washington pursues its land use goals, a critical obstacle remains: Nobody really seems to know what is underground.

Executive Summary

The Washington Center for Housing Studies (WCHS) studies and supports effective land use policies to expand housing access. Amid the growing affordability crisis, local jurisdictions have explored expanding Urban Growth Areas (UGAs) to allow for more development. Even when jurisdictions plan for increased growth within existing UGA boundaries, the areas covered by service providers do not necessarily guarantee that those providers have the pipe infrastructure or service capacity to accommodate additional development. Once a builder is required to pay to extend infrastructure, any potential for affordable development often disappears. In some cases, the project is no longer financially viable.

Similarly, statewide legislators have considered ways to sensibly expand access to buildable lands across the state. Yet, these efforts are often undermined by a pervasive challenge: the lack of comprehensive, accessible infrastructure data. Similar to the delays caused with Bertha, the absence of reliable information has become a quiet but significant barrier to planning and growth.

This report functions as an "anti-study," exploring the consequences of these data limitations on housing affordability, public safety, and long-term growth. Drawing from experiences in Washington and other states, it highlights the need for coordinated, transparent data systems to support responsible and efficient growth planning.

Results (or lack thereof)

Our research found that no comprehensive or standardized regional or statewide dataset of underground infrastructure exists. Portions of utility data exist publicly, often on local jurisdictions' websites. However, because the data is often siloed and inconsistently formatted across jurisdictions, it is extremely inefficient for broad policy analysis. There is even less information from private utility providers due to significant liability and operational concerns.

Beyond Bertha, we did find several examples demonstrating the practical cost of not knowing where infrastructure is. On Mercer Island, the city hired an engineering consultant who discovered a 12-inch water main intended for a new subdivision performed like a 4-to-6-inch line due to an unmapped 4-inch reducer (SFE Global). Identifying and resolving this bottleneck required specialized inspections, delaying construction and increasing costs. In Spokane, workers struck a 1-inch gas line during routine construction near Gonzaga University, necessitating the evacuation of 1,350 students and an emergency response (City of Spokane). Both incidents highlight how incomplete or inaccessible data not only delays housing development but also poses immediate public safety risks.

A primary barrier for sharing utility information stems from the heightened security measures implemented after Sept. 11, 2001, and the expansive legal protections for utility information under Washington law. Following 9/11, The Department of Homeland Security issued guidance for restricting access to infrastructure to prevent terrorist attacks (U.S. Department of Homeland Security). The Washington Utilities and Transportation Commission has successfully prevented the release of pipeline maps under the Public Records Act's security exemptions, and over half of U.S. states now restrict the release of Critical Energy Infrastructure Information (National Conference of State Legislatures). These measures, while designed to protect security, have been applied broadly.

Another issue is that utilities, particularly smaller ones, face financial and operational disincentives to share data. The costs of personnel, equipment and technical infrastructure, combined with the significant liability concern, results in an unclear or indirect benefit of sharing (Harvey and Tulloch).

Implications

The fragmented state of infrastructure data is a persistent bottleneck for housing affordability and urban growth in Washington. Municipalities seeking to expand UGAs or add housing units frequently encounter roadblocks; not due to physical infrastructure limits, but because jurisdictions lack reliable information about existing systems. Without clear, consistent data on water, sewer and fire flow capacities, many cities must plan "blindly," leading to delays and additional costs. These delays directly exacerbate the housing crisis by slowing the creation of new units and restricting the sensible expansion of buildable land.

Beyond affordability, outdated or unmapped utilities create serious public safety risks. Even despite proper on-site inspections, construction on sites with poorly documented infrastructure can result in utility strikes, injuries and fatalities. Fire protection is also compromised when fire departments lack accurate information on water flow and pipe capacity, particularly in areas served by private systems (Verisk).

Policy Recommendations

Addressing the infrastructure data-gap challenge would require an approach centered around standardization and incentivized participation.

New legislation could mandate data sharing by private utilities, clarifying that aggregated or anonymized planning-relevant infrastructure information can be released without compromising security or customer privacy. Such legislation should specify the types of data to be shared, including service area boundaries, pipe sizes, capacity, and hydrant locations, while ensuring sensitive information remains protected.

A compromise policy could be incentives established for private utilities to participate actively in data sharing. Grants, tax credits or regulatory benefits can offset the financial and operational costs of data management, encouraging smaller utilities to contribute without compromising their operational priorities.

Washington could look to Minnesota's approach through HF 2717 and the Minnesota Utilities Mapping Project (MUMP). HF 2717 proposed using GPS technology for accurate as-built drawings of underground facilities (KARE 11). MUMP created an open-source platform integrated with Minnesota's one-call system to provide real-time mapped visualizations of underground utilities (Common Ground Alliance). By leveraging Washington's similar existing one-call system, Digsafe, Washington could develop an integrated, real-time utilities mapping system to improve data sharing, reduce utility damages and enhance management of water and infrastructure resources.

Ideally this could result in a centralized, secure Geographic Information System (GIS) platform developed at the state or regional level to integrate infrastructure data from public and private providers, similar in scope to the Department of Commerce's Washington State Zoning Atlas. This platform should adhere to FAIR principles, ensuring data is findable, accessible, interoperable, and reusable and could include tiered access levels to protect sensitive information while maximizing usability for policymakers, industry and local government (University of Auckland).

Conclusion

Washington's housing affordability crisis is underscored by a variety of causes, and the inaccessibility and fragmentation of critical infrastructure data is not yet a widely discussed issue. However, without accurate, standardized and shared information on water, sewer and fire systems, policymakers often operate in the dark. Ultimately, it's Washington residents who pay the price through higher housing costs, delayed construction and increased public safety risks.

Sources

Common Ground Alliance. NP Case Study Minnesota Utilities Mapping. *https://commongroundalliance.com/Publications-Media/Case-Studies/NP-GSOC-Case-Study?*

Croman, John. "Excavator Safety on State Capitol Radar." KARE, 20 Mar. 2024, *https://www.kare11.com/article/news/politics/excavator-safety-on-state-capitol-docket/89-3282c928-5c4b-4c10-a48c-667f4a932985*.

Harvey, F., and D. Tulloch. "Local-government Data Sharing: Evaluating the Foundations of Spatial Data Infrastructures." International Journal of Geographical Information Science, vol. 20, no. 7, Aug. 2006, pp. 743–68, *https://doi.org/10.1080/13658810600661607*.

"HF 2717 Status in the House for the 93rd Legislature (2023." 2024), *https://www.revisor.mn.gov/bills/bill.php?b=House&f=HF2717&ssn=0&y=2023*.

"InvestigatorTM Identifies Hidden Restriction Impacting New Housing Development in Mercer Island, WA." SFE Global, *https://www.sfeglobal.com/case-studies/investigator-tm-identifies-hidden-restriction-impacting-new-housing-development-in-mercer-island-wa*.

"Natural Gas Line Struck by Workers Near Gonzaga." City of Spokane, Washington, 6 Dec. 2019, *https://my.spokanecity.org/fire/news/2019/12/06/natural-gas-line-struck-by-workers-near-gonzaga/*.

NORTHWEST GAS ASSOCIATION BP LLC KB v. Bellingham Herald and Allied Daily Newspapers, Intervenors. (2007). *https://caselaw.findlaw.com/court/wa-court-of-appeals/1233661.html?*

Open Government Laws and Critical Energy Infrastructure. *https://www.ncsl.org/energy/open-government-laws-and-critical-energy-infrastructure.*
"ResearchHub." ResearchHub, https://research-hub.auckland.ac.nz/article/fair-principles-for-research-data.

Seinfeld, Keith, and Martha Kang. "Bertha, World's Largest Boring Machine, Arrives in Seattle." KNKX Public Radio, 2 Apr. 2013, *https://www.knkx.org/2013-04-02/bertha-worlds-largest-boring-machine-arrives-in-seattle*.

"The Critical Relationship between Fire Departments and Water Providers." Verisk's Community Hazard Mitigation Services, 1 Apr. 2017, *https://www.isomitigation.com/newsletter/spring-2017/the-critical-relationship-between-fire-departments-and-water-providers/*.

"The Physical Protection of Critical Infrastructures and Key Assets." U.S. Department of Homeland Security.

"Tunnel Boring Machine Named Bertha Begins Digging New State Route 99." HistoryLink.Org, *https://www.historylink.org/file/10685*.

"Washington State Zoning Atlas." Washington State Department of Commerce, *https://www.commerce.wa.gov/growth-management/data-research/waza/*.

"Who Killed Bertha? Why the Seattle Tunnel Disaster Isn't What It Seems, and Why WSDOT Is Making a Dangerous Bet." Seattle Magazine, 18 Apr. 2018, *https://www.seattlebusinessmag.com/policy-regulations/who-killed-bertha-why-seattle-tunnel-disaster-isnt-what-it-seems-and-why-wsdot-making/*.

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