



Managing Small Town, USA

SECTOR *Public Works*
INDUSTRY *Government*

Marie Bishop
City of Bellingham, Washington
www.cob.org/cobweb/pw/eng/gis/index.htm

The city of Bellingham, Washington, like many other communities in the Northwest, has experienced unprecedented growth during the last decade. Bellingham developed its GIS because of the significant increase in utility customers and infrastructure and need to manage city growth. The Public Works Department and city GIS staff have developed a comprehensive GIS that instills confidence and pride. With the GIS, the city can respond to and serve its customers more efficiently as it continues to manage, develop, and plan for the future.

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Bellingham is located on the northern edge of Puget Sound in the northwest corner of Washington. The city provides water, sewer, and storm water utility service to its 69,260 residents and additional service to a large urban growth area.

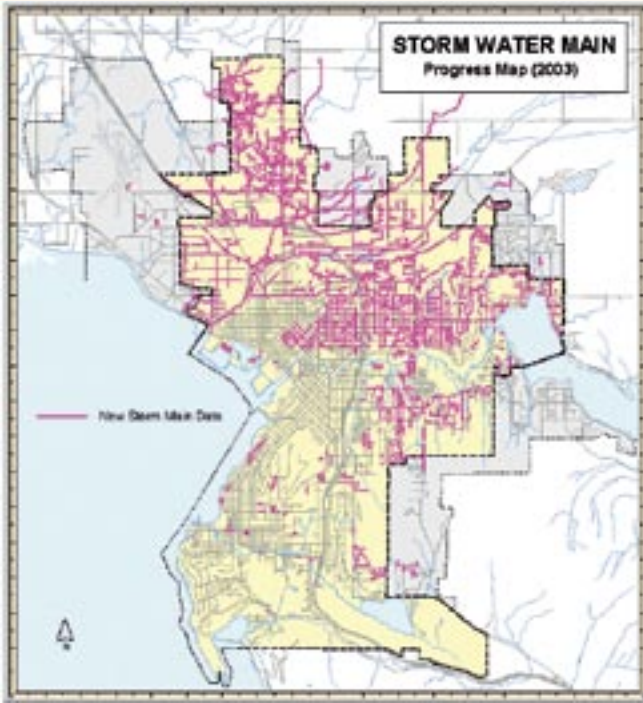
The city's GIS staff maintains all the parcel, water, sewer, and storm infrastructure data located in an area of more than 60 square miles. There are

more than 58,000 parcels, 372 miles of water main, 308 miles of sewer main, 183 miles of storm water features, and dozens of additional mapped data sets. Bellingham has accurately collected new and many existing utility infrastructure locations using survey-grade GPS since 1998. The combination of the GPS and an expansive city cadastral survey system has provided a basis for a continually expanding and accurate parcel and utility mapping base.

Achieving accurate links

Initially, the Bellingham intended its GIS to be a geographic or mapping reference for the array of tabular data used throughout the city. To accomplish this, Bellingham needed to its parcel data to accurately reference the county assessor's tabular information, record by record. Property ownership, value, deed description, and land use information is essential to land use planning, storm water utility billing, and





The city's successful development and management of the storm water utility is due in large part to the accurate and up-to-date relationships between the GIS and the assessors and the utility billing systems.

- Public Works Department's subdivision review and land subdivision records information and images.
- Public Works Department's construction project tracking information and plan images.
- Public Works Department's storm utility information system.

In addition to the assessor, maintenance management, and utility billing data, all of the other data sets identified were internal to the Public Works Department. Staff used early versions of Microsoft Access to develop many of the city's stand-alone and legacy applications, particularly those developed to track and catalogue subdivisions, construction, and development. The interface, data, and code had to be redesigned to use the data sets in the new interconnected system. The GIS staff redeveloped all of these systems into one fully relational data model with multiple relationships and data sharing throughout. Staffers rebuilt the input application interfaces around the new data model. Throughout the redesign process, they identified and created key fields to link these databases to each other and to different GIS data sets.

The following data sources were identified as being crucial to creating the data sets required for the new system:

- County assessor for property ownership, value, deed description, and land-use information.
- Maintenance management system for water and sewer structural and location information.
- Utility billing system for customer and service information.

They also developed a series of update processes for each GIS data set and its related databases. For the maintenance management system, the information is directly joined to the associated GIS file. For the assessor's and utility billing systems, the Information Technology Services Department performs weekly imports of the desired data set into an Oracle data repository. All of the other GIS-integrated data

sets, such as the subdivision, survey, and construction plan lookup, use the same Oracle repository to store their data. The maintenance of mapping and interconnection of the numerous linked databases is a well-refined process. Staffers enter, map, and interconnect Bellingham's subdivision and development information within days of acceptance or approval.

Based on the new data model, the city's GIS staff released its first version of a Visual Basic and MapObjects software-based customer service application in late 2001. GIS staff named the application CityIQ, short for City Information Query, and developed it around the premise of a one-stop information retrieval application that customers could use throughout the city. To date, more than a dozen separate data information systems with direct links to the GIS serve the public every day. The application is simple enough for the nontechnical user but dynamic enough to query and supply pertinent information. Customers now use more than sixty installations of the application. The range of users varies from customer service and utility workers to department heads and the mayor. The application provides quick and easy access to a range of integrated information.

Bellingham has experienced a number of benefits from the development of the interrelated data model. Its customer service staff can provide more information to customers in a quicker, more

efficient, and presentable manner. The city's successful development and management of the storm utility are due in large part to the accurate and up-to-date relationships between the GIS and the assessor's and utility billing systems. The city's GASB 34 asset reporting has worked well because of the interrelationship between the maintenance management, GIS, and construction project tracking applications. The Planning Department aggressively uses GIS for decision support in land-use management practices, impact analyses in development review, and modeling growth alternatives in long-range planning.

This complete data model vision continues to grow as Bellingham's user base expands and its interrelated data model develops. During the next few years, the city will build on its GIS investment with some challenging goals. With the staff members' extensive knowledge of database design, they will confidently tackle the next phase as they design geodatabase models for the land base and utility infrastructure. In 2004, Bellingham will release the second version of CityIQ, containing increased access to data relationships that have been continually developed. In 2004 or 2005, Internet and Intranet development will expand beyond the current simple data download (www.cob.org/pwgis) to an ArcIMS site that takes advantage of the city's complete data model. ◉

Adapted from ESRI's Water Writes, Summer 2003, with permission from Don Burdick, GIS manager, city of Bellingham.

ADDITIONAL BENEFITS

