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## MAPPING BC: GIS is Essential to Analysing Land for Property Assessments

**A**s a Crown corporation, BC Assessment's mandate is to assess the value of all properties within British Columbia.

BC Assessment's challenge is to constantly keep pace with new and changing inventory throughout a vast and varied province. With limited resources and a relatively fixed number of employees, we are focused on a responsibility for nearly 2 million properties that are continually growing in number and complexity. British Columbia has many different property classes to assess and a large array of property information to maintain.

Property data is collected through building permits, onsite appraisals, photo updates, and other innovative strategies, then compiled at BC Assessment to generate annual property assessment notices for each property owner.

This multifaceted property information is as complex as British Columbia's diverse geography—there are jagged coastal shores on Vancouver Island, the southern and northern Gulf Islands, the Haida Gwaii, the Inside Passage, and in the complex inlets all the way north to Alaska.

There are dense urban areas surrounded by agriculture and shipping ports in Metro Vancouver and Fraser Valley.

There are high altitudes in the Coastal Ranges in the southwest, Cassiar Ranges in the northwest, Columbia Ranges (the Kootenays) in

the southwest, and the shared Rocky Mountain border with Alberta. Interior BC goes from the oil- and gas-rich Peace River, through the forests and rangeland of the Chilcotin and Cariboo, to the vineyards of the Okanagan.

Finally, there is the huge geographic expanse of the sparsely populated northwest, bordering with the Yukon Territory.

As an organization that is in step with BC's growing population and development while keeping our staffing levels constant, BC Assessment has quickly learned to use mapping technology and imagery data to maintain an accurate inventory. Mapping has become an essential tool to review property data.

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A Geographic Information System (GIS) is used to tie mapped properties to their assessment data for spatial analysis. Using a map, an appraiser can readily visualize how property attributes are applied across properties within a neighbourhood.

With the advent of online publicly accessible maps (such as Google Earth), the general public has been provided online tools to discover the world from a satellite's perspective. This technology raises the bar, setting the expectations of the spatially curious wanting to see imagery of land anywhere on the planet that is, at most, only a few years old, if not months.

By now, anyone with an Internet connection has likely gone online to access a satellite view of his or her own home. Most recently, we have been able to virtually "drive" down almost any street on the planet and see buildings and the natural environment from a street-level perspective—no different than if we were actually on site.

With those tools and technology, GIS has evolved into one of the most innovative and efficient ways to understand property within our province.

To meet specific requirements, BC Assessment has captured much of its own street front and aerial imagery to be able to update its inventory in high density residential areas throughout Metro Vancouver, Fraser Valley, Vancouver Island, and the Okanagan, with the intent to continue throughout the rest of BC. Some of the imagery was captured through cost-sharing agreements with local governments, further strengthening those valued relationships.

Combining technologies at the appraiser's desktop, BC Assessment appraisers can review property data, aerial imagery, street front photos, building sketches, and property data within a map.

With a click of a button, the information is synchronized based on the property being reviewed—Figure 1. BC Assessment classifies the building sketches based on how closely they match the aerial photo imagery. They can then be reviewed within the mapping software for "red-flags," such as large renovations or additional buildings on a property that were not previously captured in the system.

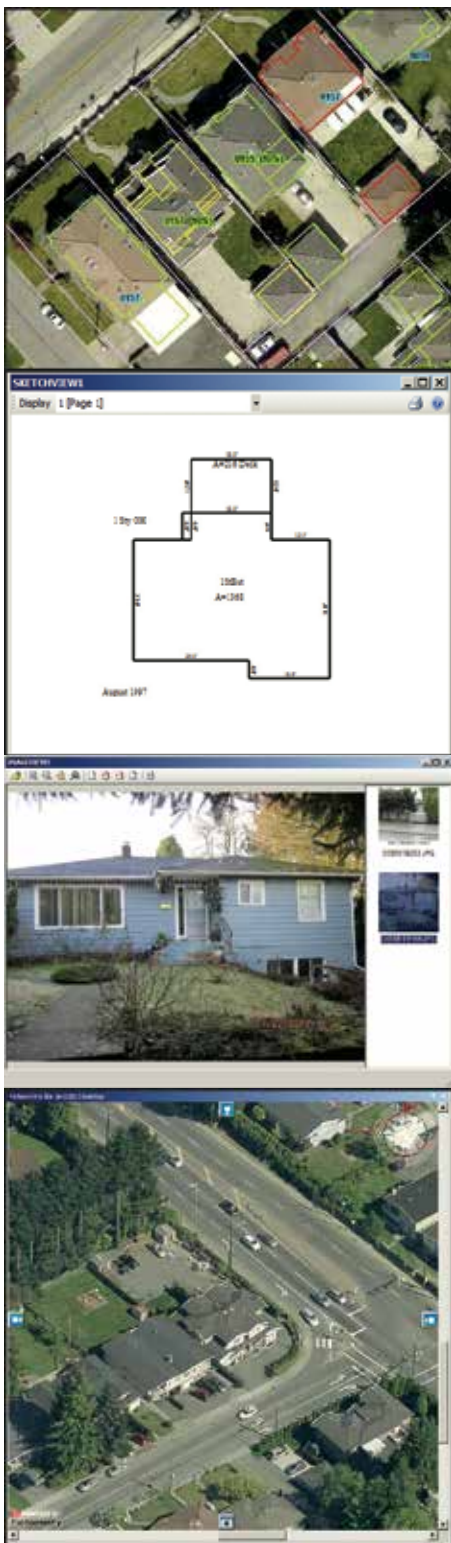


Figure 1. Desktop review of multiple datasets synchronized by property

Spatial data is also crucial for reviewing certain aspects of property information. BC Assessment strives to have fair and equitable property assessments, but errors do make it into the system. A quick and easy way to review some property attributes is through a map.

Everyone knows that waterfront properties are often worth more than others. Using GIS, this coding can be audited in a digital map with oceans or lakes visible. Any properties that are incorrectly coded for waterfront will be immediately noticeable and can be corrected from the desktop (Figure 2). The same type of review can also be done with other property attributes such as being adjacent to busy roads or next to a park.

By utilizing a GIS, BC Assessment is constantly improving the quality and accuracy of its assessment data. In turn, property tax revenues for communities are optimized which equates to better funding for our roads, schools, community centres, police and fire departments.



Figure 2. A spatial review of property attributes, such as waterfront

With so many different property attributes to maintain, monitoring trends for crucial insight can also be mapped out. Quality assurance statistics are commonly used to determine how well properties, neighbourhoods, or jurisdictions are doing based on actual sales (Figure 3).

A commonly used statistic is Assessment-to-Sales Ratio (ASR). That gives BC Assessment the ability to review properties that may be assessed significantly higher or lower than market value.

An ideal ASR would be 1.0. Lower values indicate a lower assessment than market, and higher values indicate a relatively high assessed value. Viewing this data in a map enables decision-makers at BC Assessment to see trends in areas and regions that could not otherwise be seen in a table or report.

Comparable sales can also be rendered in a map, using GIS. Properties with similar attributes and values can be visualized spatially

to see how comparable sales relate based on where they are located.

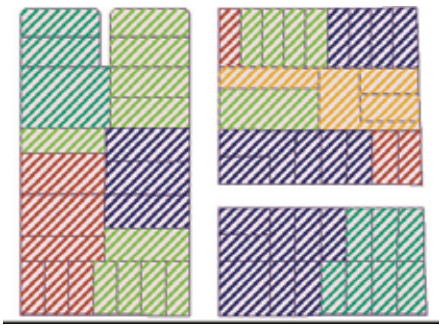


Figure 3. Reviewing property statistics for spatial trends

A final illustration of how GIS analysis improves the quality of data at BC Assessment is doing a spatial comparison. One example is the Agricultural Land Reserve (ALR). The ALR was created by the provincial government to protect current and potential arable land from being developed.

BC Assessment uses codes for ALR land on a property-by-property basis. By overlaying the official ALR boundary with BC Assessment's mapped properties, appraisers are able to see where properties may require ALR coding and the tax exemptions associated with it. By overlaying all that information with aerial photos, appraisers can further determine land use on those properties.

British Columbia is a diverse province with an ever-increasing number of properties. BC Assessment must make the most of GIS technology and the spatial data available, such as aerial photography, to fulfill its public commitment of being fair and equitable in its assessments.

As expectations for more map-based access to data and information continue to grow, so too will BC Assessment continue to use and explore cutting-edge GIS technology to deliver its mandate. ▲

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