

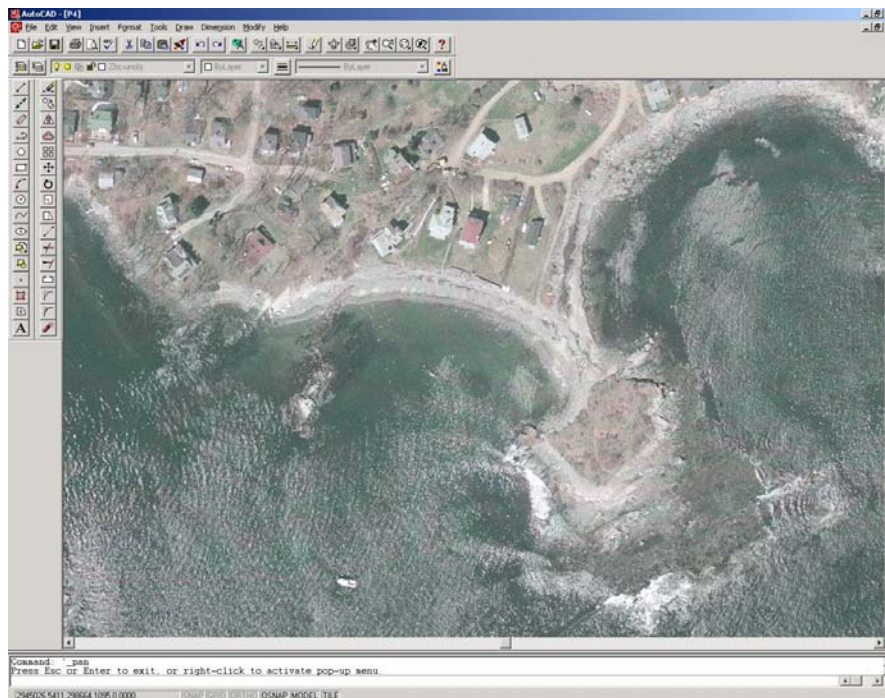
City of Portland (3-year contract)

Project Overview

In February 1999, after an extensive RFP and interview / selection process, the City of Portland retained Bradstreet Consultants, Inc. to map various sections of Portland, using aerial surveying techniques. The map data produced was either 1 inch = 50 feet with 1-foot contours or 1 inch = 100 feet with 2-foot contours. Vital and controversial areas were mapped and included the entire peninsula and waterfront (including the International Marine Terminal), Hadlock Field to Bayside, Oakdale, Boulevard Park, Deering Oaks, North Deering and the Portland International Jetport. Special attention was given to controlling and mapping (with orthophotos) the outlying island communities, which has never been properly mapped before. Services provided to date have exceeded \$200,000.

Purpose of Project

The digital mapping data formed the foundation for the citywide GIS layers. Using ESRI ArcView, ArcCAD, AutoCAD and Land Development Desktop, the city's public works staff uses the base map data to calculate storm water flows, layout sewer services, redesign and rebuild city streets, create and print tax maps, assess properties using orthophotos, generate planning and zoning graphics, determine flood zones and find the mean high water line as well as many other activities vital to the operation of the City.

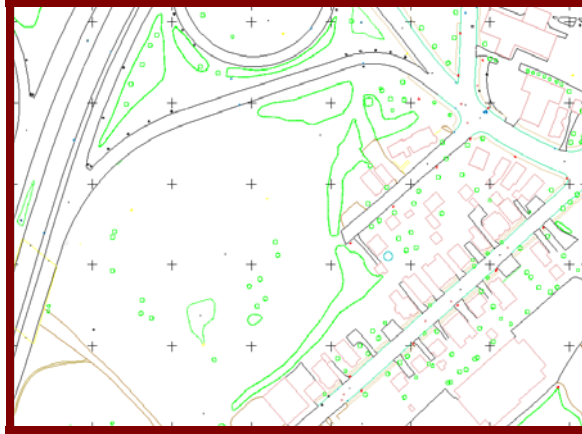


Peaks Island Orthophoto image in MrSID format (+/- 0.5 feet)

Work and Services Performed

- **Aerial Photography:** The areas are usually flown by Air Photographics, Inc. (Martinsburg, WV) or Aerial Survey and Photo, Inc. (Norridgewock, ME). The photos are usually flown at scales of 1:3,600 or 1:7,200 depending on whether 1-foot or 2-foot contours are required. These low altitude flights enable the topographic mapping to be done at a scale of 1 inch = 50 feet with a DTM collected to support 1-foot contours.
- **Control Surveys:** Multiple flight lines are usually set up with 1 control point every 2 photos. The control target are measured in the aerotriangulation process and later compared to known GPS coordinates providing the information necessary to map at the specified scale according to National Mapping Accuracy Standards (NMAS).

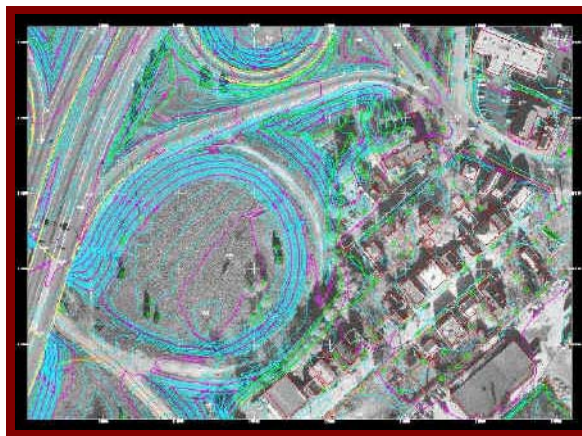
● **Fully Analytical Aerial Triangulation (FAAT):** Control was densified through FAAT. The exposure stations were computed via an intricate adjustment of the Airborne (Kinematic) GPS data. The coordinates were then used as control in the simultaneous block bundle adjustment. If Inertial Measuring Unit (IMU) data was collected during the aerial photography (such as in the GPCOG flight of 2001), this may allow the use of only 10 pre-flight targets for the entire project.



Vector data provided in AutoCAD and ArcView (+/- 0.25 feet)

● **Stereo Compilation:** The data collection was accomplished using ABC-PC Stereoplotters. The topographic data collected was used in the creation of a Digital Terrain Model (DTM), which is responsible for the creation of contour lines. All topographic projects are compiled with surface modeling techniques. This includes the collection of hard and soft breakline features with supplemental random mass points to maintain mapping accuracies. DTM projects are processed through Spectra-Precision Terramodel software, which has a direct interface with the KDMS data files.

● **Digital Orthophotography:** The digital orthophotos was a natural by product of the work as the images were scanned at a resolution of 15 microns for softcopy triangulation and compilation testing. Digital orthos were produced with a 5cm (ground distance) pixel resolution.



*High resolution Digital Orthoimage with vector data overlay
City of Portland (1998) Congress Street off ramp prior to the reconstruction*