

Aviation Week & Space Technology

Surveillance Alternative

Mar 08, 2010, p. 44

Adrian Schofield

Washington

The Winter Olympics showcased the progress Nav Canada is making in multilateration surveillance, with two projects in Vancouver demonstrating the potential of this technology.



Eleven multilateration sensors like this one have been deployed around Vancouver Harbor.

Multilateration is another advanced alternative to radar. It uses a different concept than Automatic Dependent Surveillance-Broadcast (ADS-B), relying on triangulation of transponder signals rather than GPS to establish aircraft position. While aircraft often need an avionics upgrade to use ADS-B, multilateration works with any aircraft that has a transponder.

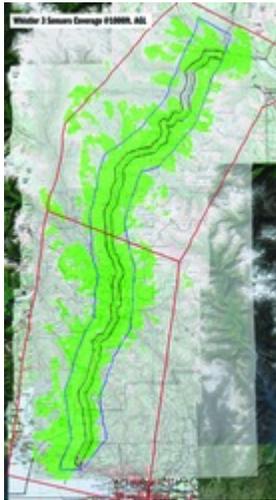
Nav Canada used wide-area multilateration to create a 91-mi. "Sea-to-Sky" corridor between Vancouver and Olympic sites in Whistler, British Columbia. This is believed to be the longest multilateration corridor yet established, requiring 32 ground sensors. The route winds through mountainous terrain where radar sites would be difficult and expensive to install.

The corridor was heavily used by general aviation during the Olympics, and multilateration allowed controllers to monitor traffic. Dedicated controller positions were established at the Vancouver area control center (ACC), providing a VFR flight information service and decision support to pilots.

The sensors have been left in place, and the multilateration corridor may become permanent, says Nav Canada CEO John Crichton. "We haven't made a final decision other than it's definitely going to be there a while," he says. The corridor should be well used even after the Olympics as Whistler becomes an increasingly popular destination.

The Sea-to-Sky corridor is just one of Nav Canada's multilateration projects. Wide-area applications are being used over Vancouver Harbor and on the approaches to Fort St. John, British Columbia, while ground surveillance applications are being deployed at Montreal Trudeau International Airport.

Crichton notes that like ADS-B, multilateration provides surveillance where topography would make radar impractical. All of the multilateration ground units are also ADS-B capable, so the systems can be upgraded in the future.



This map indicates multilateration coverage (in green) at 1,000 ft. altitude for the 91-mi. air corridor established between Vancouver and Whistler.

In Vancouver, 11 multilateration receivers have been installed around the harbor, supplementing radar coverage for controllers at the Vancouver ACC and the airport tower. Providing radar coverage of the entire harbor is impractical, as it is flanked by mountains and tall buildings, Nav Canada says.

Testing of the system has been completed, and it is scheduled to become operational in July. It will also be used to deliver traffic advisory and information services to aircraft.

At Fort St. John, a busy airport serving oilfields, regulator Transport Canada granted permission for Nav Canada to employ wide-area multilateration for all radar applications. Controllers are using it for standard aircraft separation at the airport, increasing the arrival rate. Eight sensors provide radar-like coverage within a 40-mi. radius, up to 8,000 ft. This overlaps with existing high-level radar coverage.

Meanwhile, a multilateration system will be used at Montreal to supplement the existing radar-based surface surveillance. Acceptance testing is underway, and operational use is scheduled to begin this spring. Transponders are being installed in ground vehicles, so controllers will have a complete picture of airport surface movement.

Montreal is Nav Canada's first use of multilateration for surface detection, but the company is considering introducing a similar system at Toronto Pearson International Airport, late this year or early in 2011.