

Orbiting satellite platforms allow very rapid coverage of large areas of the earth, moving at about thirty times the speed of an aircraft, and usually able to overlook a wider swath. However, they cannot spend more than a few percent of their time over Canada, are very restricted in their ability to alter their orbit, and are usually impossible to repair in the event of a failure. They are very expensive, and it is inefficient to restrict their employment to the surveillance of a limited portion of the earth when they inevitably spend most of their time over other regions. Provision of electrical power adequate for advanced sensors is a problem for conventional power generating technology.

Aircraft cannot reach the altitudes of satellites, but can spend most of their flying time over areas of interest for surveillance, and can be redirected at will. They have human operators aloft, and facilities for maintenance and repair when they land. One aircraft is much cheaper than one satellite, but a considerable number would be needed to match the coverage of one satellite over an area as large as Canada.

Stations on the ground are severely limited in their ability to provide surveillance of a large area of the surface of the earth or of activity in the atmosphere above it. An exception is Over-the Horizon radar, which is able to provide very wide area surveillance of the movements of aircraft. However, its performance is degraded in the vicinity of the auroral zone, much of which is situated over Canadian territory.

The needs for defence of Canada against attack by missiles or aircraft are virtually the same as those for the United States. It is expected that surveillance of space will continue to be conducted by the USA. Aircraft threatening North America are very likely to make their approach over Northern Canada, and there is a need for continuous effective surveillance over the approach routes in order to provide early warning of such activity. To conduct active defence it would be necessary to be able to track the progress of aircraft or air-launched cruise missiles across Canada. This would require extensive facilities, far beyond anything in place at this time, and could only be provided by a constellation of satellites. However, such a system would offer a very valuable side benefit for the control of civilian air traffic over regions where it is ineffective or unavailable today.