Remote sensing from aircraft is well developed in Canada and is being used for many civilian purposes,[50] including the passive radiometric study of ice in the Arctic to differentiate between old and new ice.

The Capabilities of the Various Sensors and Platforms to Meet the Requirements of the Different Types of Surveillance

In assessing the suitability for the requirements of Canadian surveillance of the various sensors and platforms, it is necessary to identify certain major characteristics of the objects of the surveillance. The most important of these are the extent to which they are detectable, and identifiable, whether they are moving, and the time delay that can be accepted before the information is delivered to the appropriate authority.

Target size, expressed in square metres, is a measure of detectability to both optical and radar sensors, although there are of course other factors such as colour, material, and shape, and very much depends on the background against which the target must be distinguished. Target velocity is significant for two reasons. Motion with respect to its background may make it detectable, as is the case with Doppler radar. Also, if it is in motion it may be necessary to track its progress, in which case the permissible interval between successive observations cannot be long, and it may not be acceptable to have a long delay before the detection and subsequent track is reported. The extreme cases are ballistic missile warheads moving at 7 km per second and due to impact within a few minutes, as contrasted to mapping imagery that will hardly change from year to year. Apprehension of a boat approaching the coast might allow a delay of an hour or two.

Electro-optical sensors are divided into visual and thermal, the former depending on size, shape, and colour contrast with the surroundings, and the latter on temperature difference from that of the surroundings. For example, the exhaust form a large passenger jet aircraft will radiate far more heat than will be produced by a cruise missile. An

---

[50] For example, a synthetic aperture radar developed by MacDonald Detwiller in Vancouver has been in use since 1983 and has applications in areas of forestry, agriculture, hydrology, ice surveillance, disaster assessment, geology and mapping.