

Ad Hoc Technical Support Group for the BC Network of Lead Communities Investigating Missing Children from Residential Schools

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A DRAFT summary of LiDAR analysis for communities, by Andrew Martindale, UBC.

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The use of LiDAR is often mentioned as a way of locating information about places where missing children are buried. This document outlines what LiDAR is, how it can be used in ground searches and GIS systems.

What is LiDAR?

Light Detection And Ranging is similar to RADAR but uses infrared light instead of radio waves. The principles are similar in LiDAR, **GPR**, and RADAR: a signal is sent out and its reflection is recorded to reveal what it encountered. LiDAR is used to create 3D models of surfaces. New iPhones have LiDAR as an app that can make models of things. LiDAR is commonly used to map landscapes. It can create accurate models of the land and can see the ground beneath plant cover. If burials or other historic features of interest have a surface shape, LiDAR can help find them, even in forests.

What Role Can It Play in Identifying Missing Children?

The search for missing children is partly an exploration of landscapes from the past. Information on past landscapes can be found in historic maps, old air photos, and in survivor knowledge. However, some things from the past remain visible today as shapes on the ground surface. An old building, for example, may now be visible by its foundation. Burials sometimes have surface shapes, usually slight mounds, or depressions. These are commonly seen in cemeteries. The burials of missing children may also have surface patterns. LiDAR can locate these, even if they are under vegetation or in forests.

LiDAR is collected in three ways: by airplane, by drone, and by a handheld device. Most ground searches for missing children will use drone LiDAR since it has the best quality detail of the surface shapes for the areas where burials of missing children are most likely to be. Handheld LiDAR might be useful in some places, but airplane LiDAR is not sensitive enough to find burials.

LiDAR works by sending out infrared beams and recording the reflections. The time and direction of the reflections allows us to build a model of the surfaces being scanned. LiDAR sends out millions of signals quickly, so the reflections can be filtered to remove the things that are near (like plants) and create a model of the things that are farthest away (like the ground surface). Models of the ground are usually put into a GIS for evaluation and comparison to other information.

What Are the Challenges of LiDAR Analysis?

LiDAR models of the ground from drones takes specialized equipment, software, and training. It is a useful tool for locating possible burials or cemeteries and for making accurate maps of landscapes of interest. It is fast to collect but requires specialized licensing to fly the drones and specific software and training to make the model and use it in a **GIS**.

This document is one of a series that the British Columbia Technical Working Group on Missing Children and Unmarked Burials has created to help those involved in ground searches for missing children

The BC Technical Working Group includes: Dave Schaepe (chair), Anne Atleo, Sarah Beaulieu , Remy Benoit, Kathleen Bertrand, Cara Bendzy, Hugo Cardoso, Lisa Davidson, Shannon Enns , Colin Green, Erica Kay, Amber Kostuchenko, Hudson Kunicky, Kim Lawson, Andrew Martindale, David McAtackney, Ivy Peers, Whitney Spearing, Nick Weber, Vicky White, Brian Whiting, Ashley Whitworth, Megan Whonnock.

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