

# Ontario's Imagery Strategy

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The Government of Ontario has a new five year strategy to acquire and regularly update imagery across the province. The strategy will reduce costs for all project partners and increase access and use of current, high quality imagery.

The strategy recommends:

- Acquiring 20 cm resolution, leaf-off digital ortho-photography for selected areas of southern and northern Ontario and commercial satellite imagery in other areas, such as the far north.
- Refreshing the ortho-photography every five years and provincial satellite imagery every ten years.
- Establishing a governance model that includes senior managers from various ministries and annual project steering committees consisting of government and non-government representatives.
- Formalizing Land Information Ontario's role in coordinating multi-partner acquisition projects and storing and distributing imagery data.
- Developing a funding model to cover Ontario's share of costs in projects and a funding model to share costs between all project partners.
- Creating polices to access new and existing imagery products.

## Implementing the Strategy

Two contracts were tendered and awarded for the collection of digital ortho-photography across the province:

Imagery Acquisition Area	Frequency	Vendor Name
Greater Toronto Area	Once in 2013 with options to 2017	First Base Solutions
Selected areas of the province	Annual collection starting in 2013 and going to 2017	Fugro Canada

## GTA Project

This project is funded 100 percent by government ministries that require ortho-photography covering the five municipalities that comprise the GTA (Metro Toronto, Halton, Durham, York, and Peel). The ministries can only use this imagery for internal government use.

New imagery of the GTA was captured in spring 2013 and will be delivered to Land Information Ontario this fall. The project contract provides options that allow the Province to acquire imagery for all or parts of the GTA on an as needed basis to 2017.

Land Information Ontario cannot provide access to the imagery. Businesses or individuals can acquire the imagery products through the vendor (First Base Solutions). There

are several other private sector firms that provide access to imagery products and services covering the GTA.

## GTA 2013 Project

Collected April 2013

Number of days to acquire imagery = 11

Number of planes used = 1

Number of sq km = 7,029

Number of flight lines = 122

Total length of flight lines = 6,035 km

Number of images = 12,694

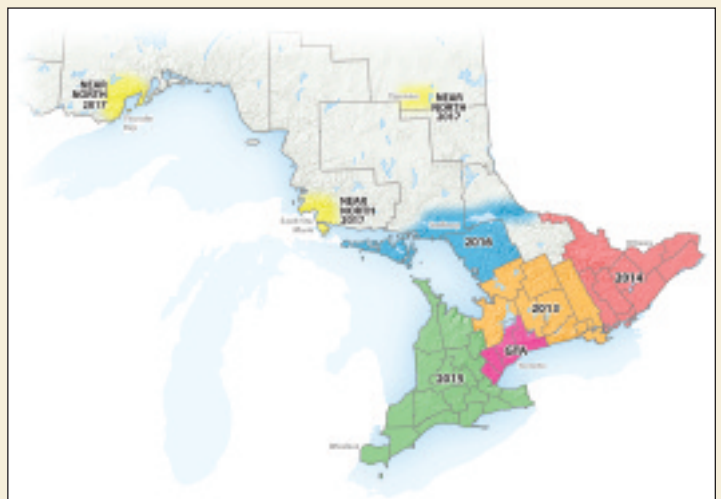
Size of the data = 1Tb



First Base Solutions aircraft equipped for imagery acquisition.

## Selected Areas of the Province

Projects ranging in from 35,000 to 40,000 sq km will be collected over the next five years (see Map 1). These annual projects are funded by the Province and eligible project partners including municipalities, conservation authorities, non-government organizations, first nations and the private sector.



Map 1

## A Partnership Approach to Projects

Land Information Ontario's imagery acquisition projects use a partnership funding model that provides significant cost savings and allows organizations to access imagery they might not afford to acquire on their own. For example, in 2010, Land Information Ontario coordinated an imagery acquisition project in southwestern Ontario. The total project cost was \$2.2 million or approximately \$48 per sq km. Over 60 organizations joined the project which reduced the partners' costs to less than \$8 per sq km. This type of huge savings would simply not be available without a partnership approach to the acquisition projects.

## Imagery Standards

The imagery standard includes digital ortho-photography with a 20 cm resolution accurate to 50 cm with leaf-off, no-snow conditions to ensure users can identify and map features under deciduous tree canopies. These standards also permit highly accurate elevation mapping.

## Eligibility and Licenses

Municipalities, conservation authorities, federal departments, First Nations, non-government and private sector organizations are all eligible to participate in these acquisition projects.

All products generated from these projects, including ground control, stereo imagery and the ortho-rectified imagery itself will be owned by the Government of Ontario. Contributing organizations are granted a licence to use the imagery and associated products.

## Funding Model

The funding model was designed to allow organizations to share acquisition costs. Each partner selects the area(s) they are interested in acquiring. The total number of square kilometres is used to calculate a shared cost, based on the overall project costs. Municipalities can select their jurisdiction, plus a "buffer" if they choose. Private sector and non-governmental organizations can order imagery for their area(s) of interest. There is a minimum contribution limit of \$1,000 for any participating organization.

For organizations that want to take advantage of the cost savings but do not have a predefined area of interest, a "subscription" option is available. The subscription option allows any organization to provide a minimum of \$1,000 towards the acquisition and order imagery within the current project area "as required". The imagery costs would be the same as the partner cost and the imagery can be ordered for a period of up to three years after delivery. The first delivery of those products is available for no charge while any subsequent orders would be subject to a \$100 administrative fee. This option is beneficial to organizations who do not know in advance where future projects might be located.

## Year One – South Central Ontario

More than 80 organizations attended a kick-off meeting showing strong support for the five year strategy and the first acquisition project in south central Ontario.

Acquisition began in the spring of 2013 but experienced a series of challenges along the way. Snow and ice were present across the entire area almost until mid-April, which is normally the start of the "flying season" in southern Ontario. When flying finally started, although most of the snow and ice was gone, the buds on the trees had already started to swell (Image 1). Further north was a different scene altogether. Ice was predominant across the Kawartha Lakes (Image 2) and, even further north the snow was deep and the ice on the lakes was still over 30 cm (Image 3).



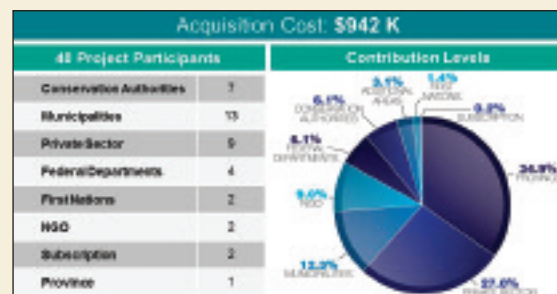
Image 1

Image 2

Image 3

A total of 40 partners participated in the project. The funding model provided partners with 85 percent cost savings compared to doing the acquisition on their own. The value of entering into these partnerships cannot be understated.

The diagram below shows a breakdown of partners and the percentage of funds contributed to the project. Imagery products will be delivered to Land Information Ontario for quality assurance processing this fall. Delivery to project partners will begin later this year. The partners will conduct their own quality assurance processes and identify errors or



Fugro aircraft equipped for imagery acquisition.

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omissions. Land Information Ontario will then inform the vendor for their correction and subsequent re-delivery of the imagery products.

## South Central Ontario 2013 Project

Collected April/May 2013

Number of days to acquire imagery = 10

Number of planes used = 4

Number of sq km = 35,762

Number of flight lines = 288

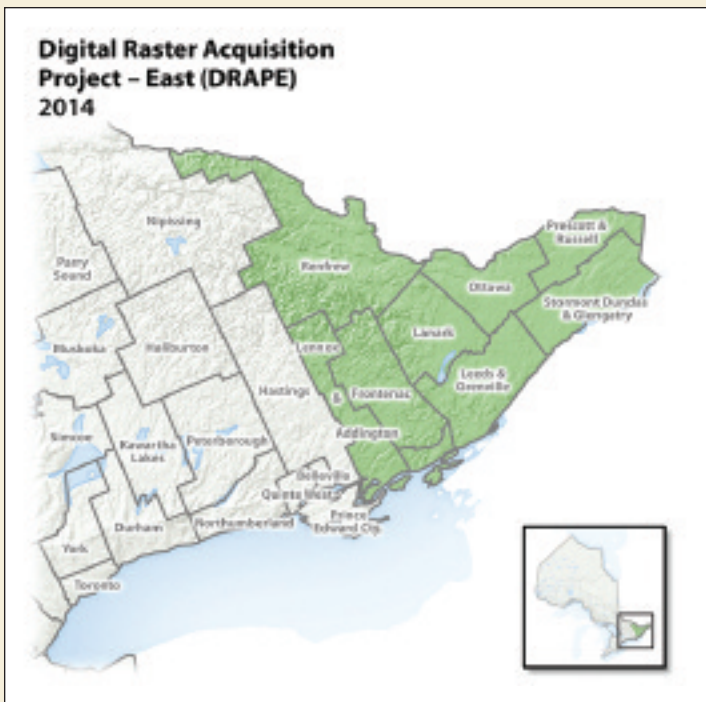
Total Length of flight lines = 20,763 km

Number of images = 35,762

Size of the data = 90 TB

## Year Two – Eastern Ontario

Land Information Ontario is developing the partnership for the next project area in south eastern Ontario (see Map 2) which will be acquired in the spring of 2014. That area is similar to the Digital Raster Acquisition Project – East (DRAPE) that was completed in 2008.



Map 2

## Benefits to Ontario Land Surveyors

The two largest government ministries with professional surveying staff are the Ministry of Natural Resources (MNR) and the Ministry of Transportation (MTO). Their use of imagery includes:

### MNR

- Creating descriptive maps showing imagery and base data layers (e.g. lakes, rivers, wetlands, roads, railways, utilities, private ownership, lot fabric)
- Defining map features such as roads and/or utility corridors that are visible but might not exist in the vector data (e.g. hydro poles, etc. to identify a strip as

a utility corridor).

- Defining the extents of pits, quarries, boat launches or other improvements.
- Identifying unauthorized occupations on Crown land or the extent and location of Licences of Occupation.
- Locating parcels where the lot fabric data might be significantly misaligned.

### MTO

- Planning and designing highway route improvements.
- Managing property and corridors.
- Maintaining asset inventories.
- Supporting legal issues.
- Supporting drainage and environmental assessments.

Within the private sector, surveyors use ortho-rectified imagery to support a variety of surveying activities, including: planning field surveys, identifying features on the landscape that should be investigated, comparing existing conditions to proposed site plans, checking the possible locations of registered and previously surveyed monuments and using the elevation products to pre-design and allow designers to estimate development activities. Imagery can also be used in reports and plans to provide context and detailed site information.

Ontario's surveyors can become partners in any Land Information Ontario acquisition project and can pre-purchase imagery through a reduced 'subscription' agreement. By participating in these acquisition projects, partners are provided a copy of all of the project deliverables (e.g. ortho tiles, raw/stereo data products, mass points and break lines used to orthorectify imagery, metadata for all deliverables)

The licence does not allow the re-selling of imagery to other parties; however under these agreements you can create and own derivative products.

Alternatively, Ontario's surveyors can work with a commercial vendor that will provide access to various imagery products and services.

## Going Forward

Ontario's imagery strategy has been implemented exactly the way the founders had hoped; good people doing good work with a lot of strategic planning. We are well on our way to delivering excellent images of all of Ontario over the next five years. Organizations that need current imagery are now able to plan for projects in advance. Join our adventure; save money and improve the quality of the products that you deliver to your clients.



For more information on this or any other acquisition project, please visit the LIO website <http://www.mnr.gov.on.ca/en/Business/LIO> and search under Ontario Imagery or contact **Mike Robertson** at [mike.robertson@ontario.ca](mailto:mike.robertson@ontario.ca) or 705-755-1280.