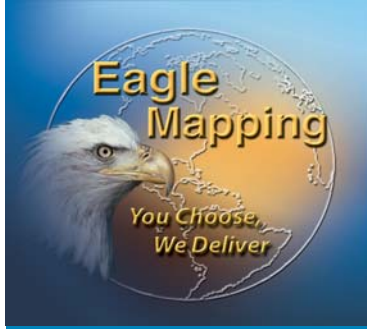


Mapping That Works



HOW TO ACQUIRE CUSTOM MAPPING

6 ESSENTIAL STEPS TO SUCCESS

Is the acquisition of mapping as complex as a design-build project?

No, but if your designs are based on faulty mapping, you could experience over-runs and re-designs that could impact your project costs significantly.

These six steps can help you acquire mapping that works for you:

1. Business Needs and Use

Commercial-off-the-shelf Mapping

Many clients ask “Will off-the-shelf mapping work for me?” If you answer ‘no’ to any of the following, then you should consider custom mapping:

- *Is accurate mapping available?*
- *Is it of sufficient detail and up-to-date?*
- *Is it compatible with our GIS systems?*

Custom Mapping

Your service provider must have a clear understanding of your intended use in order to accurately estimate and provide the most beneficial solution at the best price. Before you call, consider these questions:

- *How detailed do you need to know the lay of the land? Who will be using the information? (e.g. engineers, environmental consultants, geologists, financiers)*
- *At what stage in the life-cycle is your project? (e.g. feasibility, exploration, analysis, design-build, expansion, or reclamation and closure)*
- *Are there substantial obstacles? (e.g. ground access, terrain, weather, regulatory)*
- *Is this short-term or long-term? (e.g. one cost-effective flight, then map as you grow)*
- *How will you use the maps? (e.g. in GIS, in the field, as a 3D fly-through movie for investors)*

2. From Schedule to Approvals

Communicate your schedule, deadlines and budget. Does your project need board, financing, legal or regulatory approvals? For example, with enough lead-time, your provider may be able to create savings by sharing aircraft mobilization and/or ground survey costs.

3. Specifications

Accurate specifications are critical to success. Requesting the wrong level of detail, or mapping beyond boundaries roughly estimated could increase costs and delay schedules. By working with a mapping specialist, you can jointly define all critical factors, for example:

- Determine optimum accuracy and detail, such as contour intervals, breaklines and features (e.g. rivers and buildings vs. sprinkler heads and golf-ball washers).
- Determine if your team needs the elevations with or without visualizing the ground in air photos.



- Maintain open communication channels (e.g. field, consulting & engineering) and avoid costly re-mapping in the future.
- Avoid increasing project costs by accurately defining your area(s) of interest. To define property boundaries you can identify latitude/longitude or UTM coordinates (e.g. Universal Transverse Mercator) or contact the local government for existing maps.

- Ground survey control coordinates are used in conjunction with flight data to compute orientation parameters required to compile mapping data. If unfamiliar, your service provider can sub-contract and manage this stage of the project to ensure ground and flight data coincide. It is usually preferable to conduct the ground survey prior to the flight. If it is difficult to access your property on the ground, discuss which techniques minimize ground control requirements.

4. Remote Sensing Options

It is important to understand available techniques and select the best option(s) for your project. The following highlights three remote sensing techniques on the market, which may be used independently or together.

Aerial Photography

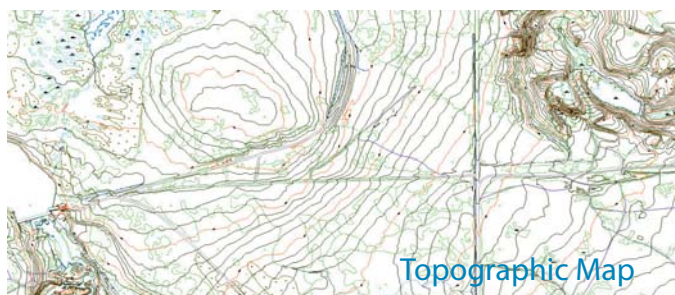
Aerial photography (digital and film) is acquired by flying in an established grid pattern over your area of interest at a specific altitude. The flying height, among other factors, determine the accuracy of the resulting mapping products. Aerial photography, when used in stereo pairs, provides a 3D quantitative representation of the terrain (e.g. elevation, slope and features). The biggest advantage to using air photos over LiDAR or Satellite Imagery is that it can be designed to capture all visible features.

LiDAR (Light Detection & Ranging)

LiDAR is similar to RADAR with light replacing radio waves. The result is the ability to produce accurate, detailed surface models quickly and often at reduced costs over conventional photogrammetric mapping for medium to large areas. LiDAR can provide extensive information regarding vegetation and other above-ground features, in addition to “seeing” below the vegetation thereby simultaneously mapping the forest floor and modelling the canopy above.

Satellite Imagery

Imagery from satellite sensors may be used to create maps and visual tools for your project. A mapping specialist can help you determine which satellite sensor is appropriate, and either search for existing images, or task a satellite to acquire new images. Satellite imagery is a good source for large areas that do not require engineering scale detail.



5. Product Choices

Discuss with your provider what product options would be the most useful to your team. The following highlights some of the most popular products available:

Topographic Mapping

A digital terrain model (DTM) consists of a grid of XY (horizontal) and Z (elevation) points and breaklines, which define the geomorphology of the landscape. The result is a very accurate 3D surface model of the terrain, the hydrography and other features observed on the air photo. The DTM can be collected at various densities depending upon the required deliverables and budget.

Orthophotography

Orthophotos, which can be used as maps, are distortion-corrected air photos. Using specialized ortho software, the scanned or digital imagery is rectified using the DTM to create an orthophoto mosaic, with a pixel size depending upon your requirements. The rectified images are mosaicked together and colour balanced into a single orthophoto image.

Fly-Through 3D Movie Visualizations

Fly through your property or project by watching a movie created from the digital terrain model and orthophoto mosaic of your project. It is a valuable display tool for all your stakeholders.

6. Input to GIS and Business Use

Discuss with the mapping specialist how you want to use your maps. For example, do you wish to add the information into your existing GIS package, or take waterproof maps into the field to enable your field staff to write on them.

Mapping that works for you can be a key enabler for all stages of development and operations. By following the steps outlined in this paper, you will not only fast-track the commencement of your project, but also ensure your team has the tools and information necessary to do their jobs right the first time.

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