

**Risk Management with GeoAutomation**

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*December 21, 2010*

# Risk Management with GeoAutomation

**GeoAutomation is a mobile digital imagery camera system, providing near 360°, survey-enabled, georeferenced imagery capable of mapping accuracies ranging from GPS quality through to the high accuracy survey requirements demanded in Engineering Road Design. With 14, 2MP, digital cameras, this totally optical system is an excellent tool for: Asset Inventory Collection and Management; Pavement Condition Assessment; Topographic mapping data collection; Engineering quality surveys; and 3D modelling.**

(Readers are encouraged to examine the “Introduction to GeoAutomation” White Paper before reviewing this document.)

This Paper describes how GeoAutomation imagery can be used in the Risk Management of a road construction, or civil engineering, project.

The Problem:

Post road construction damage claims can be very time consuming and very expensive. Additionally, the potential costs of litigation and the often difficult task of disproving an assertion of damage can lead to settlements of even the most doubtful of claims.

The concept of a visual record of pre construction condition has been around for some time and has recently been augmented by the utilization of video. However, still photography and video suffer from three significant drawbacks:

- Limited number of views.
- Inability to take measurements (should they be needed).
- Low image resolution.

The Solution:

GeoAutomation imagery offers a mitigation solution that does not have these limitations.

- With 14 cameras and views the GeoAutomation system captures almost every conceivable angle and viewpoint.
- With a phased approach to image processing (see below) should a claim proceed to where accurate measurements are required, the imagery can be processed to obtain the measurement capability required.
- GeoAutomation’s imagery is typically at a higher resolution than most video collection, allowing clearer review and inspection.

## Phased Imagery Processing:

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### Phase 1:

Imagery is collected and delivered within a day or two of collection. The date-stamped imagery is not georeferenced and no measurements are possible. With the supplied software, users are able to zoom in and inspect features, and can 'drive' the route at any time, in any direction, and from any of the 14 camera views.

This capability is often enough to determine the veracity of any claim and determine the course of action to take with a claimant.

As the imagery is available days after collection it can be shown at public discussion forums on the project. This strategy can help in public acceptance of the project and is useful as a deterrent on frivolous damage claims. At the same time it reinforces amongst the project's contractors that there is now a mechanism that can track damage they might cause.

Due to privacy concerns the imagery cannot be displayed on any public internet site without first being sanitized to removed faces and licence plates and / or vehicles.

The imagery is collected with GPS data. Users also have the option of laying down targeted control along the route. None of this data is utilized in Phase 1 Imagery. The image accuracy available with GPS data is in the 20cm – 30cm range. With the addition of targeted ground control accuracies of up to 2cm can be achieved.

The extent to which a client chooses to lay the targeted control depends on a variety of factors. These include: his risk tolerance; the potential for claims on this project that might require higher accuracy imagery; cost of the targeting; and his understanding of the additional benefits accrued with the addition of ground control.

The most important point to note is that the targeted ground control cannot be added at a later date.

### Phase 2:

Despite your best efforts, a claimant still is determined to proceed. To best determine the validity of the claim, it would be beneficial to be able to measure the length, width, area or height from the imagery. Because the route was originally collected with GPS data and / or ground control, the original imagery can be processed and subsequently such measurements can be obtained. As these measurements are based photogrammetric science they have a very strong standing in court.

At this point a claimant's view may be proven or disproven or still might require a court decision. The key point here is that all the data needed to make an informed choice is now available.

### Phase 3:

Phase 3 imagery is the logical extension of the Risk Management process with GeoAutomation imagery. Once the project is complete, collect the imagery again along the same route. This establishes when the project was complete and the condition of the roads and adjacent property at the time of completion.

The availability of this imagery also makes discussing Phase 1 or 2 claims even clearer and easier.

## **Additional Benefits:**

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With targeted ground control the Client can, at any time, process any portion of the construction route to the accuracy he requires and make this imagery available for GIS data collection, or for producing cross sections, in support of the Engineering Design process. It is an excellent tool to help expand an often tight production schedule.

With targeted ground control the Phase 3 imagery can also be considered a 'virtual' as-built – eliminating the delays and all the problems associated with obtaining an as-built drawing once the construction is complete.

## About McElhanney Consulting Services Ltd.

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For over 100 years, McElhanney has provided innovative engineering solutions to municipal, provincial, federal, transportation, and construction clients. With offices in BC, Alberta and Indonesia, we are a multi-discipline consulting firm, offering a complete range of integrated services to answer all your engineering, surveying, planning, mapping and environmental needs.

McElhanney – proud of our success. Proud to help build our communities.

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Or visit: <http://www.mcelhanney.com/mcsl/products/geoautomation.php>

## Additional White Papers on GeoAutomation from McElhanney:

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- Introduction to GeoAutomation
- Asset Inventory and Topographic Data Collection
- 3D Modeling
- Engineering Survey
- Pavement Condition Assessment
- Virtual As-Builts