

Ontario Professional Surveyor



www.aols.org

on the cover ...

Toronto, Ontario

Site of the 121st AOLS AGM

February 26 to March 1, 2013

also in this issue ...

3D Imaging

The Alleyway Project

BIM Ready Topographic Surveys

Attracting and Recruiting Survey

Technicians through a College Connection

Managing the Surveyor/Client Relationship:

Lessons we have all Learned

**plus our
regular features:**

Educational Foundation

News from 1043

Industry News

Book Reviews



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ON THE COVER ...

The photo on the cover is a view of Toronto’s Old City Hall, a heritage landmark on the corner of Queen and Bay Streets (home to city council from 1899 to 1966). It overlooks the skating rink under the arches at Nathan Phillips Square immediately in front of Toronto’s current City Hall. Photo credit: www.TorontoWide.com, Photographer: Doug Brown. The 121st AOLS Annual General Meeting will be held at the Toronto Marriott Downtown Eaton Centre Hotel in Toronto from February 26 to March 1, 2013.

*Professional
Surveying
in
Ontario*

*encompasses
the
Disciplines of*

*Cadastral,
Geodetic,
Hydrographic,
Photogrammetric
Surveying
&
Geographic
Information
Management*





President's Page

By Paul Benedict, O.L.S., O.L.I.P.



It's amazing how quickly the year has gone by. It has been an incredibly busy, often hectic year filled with plenty of challenges, accomplishments and many ups and downs.

I have had the opportunity to travel the country attending each Provincial Association's annual meeting. From coast to coast, it is interesting to learn that we all face the same challenges and issues. Except for Alberta and Quebec, we all seem to share the same aging demographics and an inability to attract students to replace those retiring. We all seem to have issues with a lack of government relations with our provincial and local governments to varying degrees. By cooperating and sharing our experiences and resources we can learn from others and save from "reinventing the wheel." An excellent example of this co-operation is our collaboration with the Association of Canada Lands Surveyors to support and promote their GeoEd on-line learning portal. This site is an additional resource for relevant courses and materials for mandatory professional development.

The Ontario Digital Cadastre Corporation (ODCC) has taken a lot of time and investment over the last two years. In that time we have managed to launch the corporation and secure our first contracts. At present, the Association is the sole shareholder. The next step is to figure out a new ownership and share structure that will allow for broader membership ownership and participation and allow ODCC to raise the capital necessary to develop and grow. ODCC has a lot of potential to raise the profile of Surveyors and to provide revenue streams on products for clients that we have would never have considered or even known that they existed. Collaboration, cooperation and participation is needed by all in order for ODCC to be a true success.

By the time you are reading this you will already know that a beta version of our new website has been launched. Although the site will undergo more work to give it more flash and polish, the behind the scenes back office functionality has been the focus of the work to date. It is hoped that this new and updated functionality

will reduce the amount of staff involvement in processing payments and course registrations.

After many years and lots of hard work by many volunteers, mandatory Continuing Professional Development (CPD) has finally been passed into regulation. Although there is the usual complaining at first, other Associations have found that CPD has become a really positive force. CPD has brought members out to meetings, increased cooperation and raised the education levels of members across a broad range of topics.

The one low point this year has been the number of cases that Council has been asked to refer to discipline. Discipline is not something Council treats lightly and disciplining a member is often a last resort. Given that these are open cases I can't say much more until the process has run its course. The potential costs of these cases will have an impact on our 2013 budget and could constrain the AOLS from progressing on a number of initiatives. I hope that CPD and additional education can form the "silver bullet" that can turn this recent trend.

The AGM planning committee has been busy organizing the 2013 AGM at the Toronto Eaton Centre Marriott Hotel. There is an exciting program and your attendance can go a long way to satisfying your CPD obligations. Along with plenty of educational opportunities, this year's keynote speaker is Neil Hetherington, CEO of Habitat for Humanity Toronto. Habitat is a worldwide organization that I have been personally involved with on many levels and I am often amazed when a community shares a common vision and works together at what is possible and how it can change the lives of a family. Based on my daughter's involvement, this year's President's Luncheon speaker is Murray Howard who is the President of the George Bray Sports Association. George Bray is an award winning non profit hockey organization that takes children with special learning needs and stresses "fun – not competition" and helps them develop their confidence and sense of participation in a team sport. George Bray is another shining example of a community collaborating to change lives.

I look forward to seeing everyone at the AGM.



Managing the Surveyor/Client Relationship: Lessons we have all Learned

By Izaak de Rijcke, LL.M., O.L.S.

We¹ could choose to call this recent Continuing Professional Development (CPD) event a seminar, webinar, course, or video, and all would be correct in describing the experience. In this article, we hope to share our experience in building this CPD product and to reflect on lessons that we have learned. Accordingly, we will touch on the content and materials themselves, the method by which delivery to participants took place and also review the method by which learning was actually accomplished. Originally conceived as an idea for a distance education seminar in early 2012, this topic grew out of a sense that, as a profession, we were not succeeding in our communications with clients. This has led to misunderstanding or, at its worst, has resulted in complaints which in some instances led to discipline. Increasingly, the last several years have seen the appearance of a reported discipline proceeding in the *Ontario Professional Surveyor* magazine as an almost regular event. Sadly, many of these reported decisions reflect a relationship between a surveyor and his or her client that no longer worked - or perhaps never did work.

It prompted me to ask myself, why? Are we somehow misunderstanding what our clients want? Do we create unrealistic expectations? Is there a disregard for how we integrate ethics into our business relationships? Maybe all of these reasons are somewhat valid. This seminar topic was then investigated from the point of view of what other professions were doing about supporting their members' interaction with members of the public. Surveyors are apparently not alone in being challenged by some of these issues. Architects, engineers, and lawyers all have codes of ethics which detail the minimum level of ethical interaction and conduct. Codes of ethics are attempts to define minimum levels of ethical behaviour in which values such as honesty, integrity and accountability are held paramount. That said, individual professionals function in a society in which they are respected because of their special expertise and competence. They are approached and needed in our society for these very reasons - but usually in the context of the professional working in the public service or in a private practice. Irrespective of which, a business aspect, or a service delivery component then defines much of what takes place. This seminar aimed to assist professional land surveyors in gaining *insights* into what contributes to this complexity, the potential sources of

confusion and to provide possible strategies to manage risk and have a successful outcome at the end of a project.

Our approach to building this CPD product was to focus on three distinct components:

1. Content (resources and tangible things to read);
2. Method of delivery (a traditional “in person” format was later adopted in addition to an online video of the presentation); and
3. The interactive “self-learning” that needed to be experienced by the participant.

Content

Perhaps the most surprising reaction that we received as feedback was how much the resources that we provided through a downloadable set of materials were appreciated. These were compiled from many different sources and then edited, annotated and formatted so as to create a logical flow. Sample contracts were used with highlights of what other professionals considered to be “best practices”. This included links to videos that served to highlight awareness of a practitioner’s own style of interacting with clients and the public. Below is a screen shot of what some of these resources looked like to a participant while online:



One might well wonder how this is helpful, or even relevant. Near the start of the Annotated Readings the following appeared as an explanation, or hypothesis, for why this topic is both timely and relevant,

“The idea for this seminar has been growing for a number of years. In working with land surveyors in my law practice I have had many opportunities to witness exchanges that took place between land surveyors and their clients. The interaction was not

¹I refer to both myself and “we” in this article. Of course “me” is a reference to myself, but “we” and “our” are references to the team involved in building and maintaining this seminar and the learning products of Four Point Learning at <http://4pointlearning.ca>, which offered this seminar.

much different from what I witnessed and experienced in the slowly changing interactions that I and other lawyers have with clients in the practice of law. These changes can be attributed to a number of factors:

(a) A changing public – Whether or not this can be blamed on the litigious American, or if it is simply a changed level of expectation, the public seems to have a different mood today than, say, 30 years ago. All are consumers and have a basic assumption that may be best captured by the statement, “If I am the one paying you to do my survey, then I am the one who gets to tell you where my property corners are and how to do it”.

(b) A more complex society – This factor may or may not be valid. Certainly at a point in time when traditional roles were established and understood, the layperson respected (if not begrudgingly) the professional. It was part of the “public trust” that professionals accepted and undertook as part of that role. Today, everyone considers themselves to be a professional. In my law practice, one of the most difficult challenges that I face is to help a client “unlearn” the misinformation acquired through the Internet. Not only are roles blurred, but who is responsible for the relationship is no longer as clear-cut as might be hoped.

(c) The more complex field of professional surveying: reliable geospatial data is everywhere – and free. This fiction is the starting point for what the public holds as a reason for thinking that you are charging too much. Of course, this underscores the need to do more than communicate – it requires the education of laypersons as to what you do. This is not the same as offering a degree program in geomatics engineering – but it should be comprehensive enough to help a layperson understand why your work cannot be performed by a hand-held GPS from Canadian Tire.™ In addition, the complexity of research in an electronic land registration system has actually become more difficult for land surveyors, rather than more efficient, as for lawyers engaged only in transacting.

The net result is the challenge at this point in time to improve our practice in how we manage our relationships with clients.”

Method of Delivery

Our approach is one that builds on collaboration among participants. Certainly none of us have all the answers and nowhere is this truer than in the world of human relationships. We were therefore surprised when the preferred method of delivery was a traditional, “in person” presentation that

required limited preparation by participants in advance and used AV technology that has been available for decades.

In comparison, we had designed and enabled a platform for delivery of a CPD product that not only allowed for full participation from remote locations; it also allowed for the option of viewing the presentation at a later time that might be more convenient or take place in an environment that was more conducive environment than a traditional presentation made “in person”. In some respects, this was a misread on our part. Many participants expected - even preferred - a traditional “in person” seminar. The challenge for us became one of delivering this traditional expectation while at the same time offering a fully enabled experience of not only the presentation itself, but to demonstrate the resources available on the website for this seminar, together with additional learning tools. While this required extensive travel and significantly more time to facilitate the delivery of what had been planned and budgeted for as a single delivery on line, it also allowed for an explanation of why the on line experience was far superior to the traditional presentation. This could be explained by demonstrating the additional features that were available on the website, while at the same time navigating participants through these resources for the first time when many might not have had an on line CPD course experience in the past. The irony was that there were a few experiences in which the “in person” presentation could not demonstrate the richer content and experience on line due to firewalls and bandwidth issues in some hotel and other venues.

The Learning

To some readers it might seem odd to even suggest that “learning” needs to be considered as part of a CPD experience. However, upon closer consideration, I am confident that everyone would conclude that “learning” is, or should be, the paramount goal of participation in professional CPD. If we cannot attain and confirm the attaining of this goal, CPD may well be a waste of time. If one believes that the main purpose of CPD is to develop professional competence for what one does now, and what one needs to know in meeting the changing demands placed on a professional surveyor, then learning the competencies that allow one to adapt to the changing nature of professional practice, in a changing society, is essential.

Being able to answer the question, “Has learning taken place?” becomes critical. For both the professional and the regulator, verification through valid assessment methods which measure the competencies achieved or developed becomes an important component. For the professional, he or she is well served in feeling confident that understanding, at a level that is usable and appropriate to discharge their day to day responsibilities, ensures a certain level of comfort, not to mention profit. For a regulator, verification of competency acquisition ensures that its responsibility to protect the public and promote competency in its professionals is discharged.

Our CPD, as a consequence, is designed to facilitate competency acquisition and verification. In addition, access to supportive resources allows practitioners to revisit, reinforce

and review their learning.

Perhaps this can be best illustrated by making reference to some of the self-study questions that were part of this resource. For this seminar, 7 questions were designed to prompt further reflection. Examples of two such questions were:

“Your client has hired you to prepare and submit a survey for a planning approval to the local authority. The date for submission is time sensitive and will expire at the end of the week. Can you refuse to submit the survey because?

- (a) your client has not paid your bill from 2 months ago;
- (b) your client is refusing to pay for the work you have done until after he has obtained planning approval.”

and:

“A member of the public asks you to complete a survey that another surveying colleague has refused to finish. The prospective client brings you a copy of the other surveyor’s draft plan. What are the factors that will determine whether or not you can accept this engagement?”

Clearly, these are tough questions which do not necessarily have a single “correct” answer. But this is the point. Learning takes place as a participant posts an answer to the question, which is then followed by a revealing of what I have posted as a possible “model answer”. Replies from other participants are revealed as well – so that a view of possible answers causes a participant to reflect further.

Below is a screenshot of the view:



As mentioned at the start – none of us has all the answers. However, the collaborative learning model used by us in this seminar was well received, despite its novelty and despite the expectation that this was to be a traditional “in person” seminar. One of the lessons I learned was the need to do a better job at communicating how this kind of seminar would occur and, once communicated and underway, to not change significantly the seminar product itself. I continue to learn.



Izaak de Rijcke is a licensed surveyor based in Guelph, Ontario. He is a practicing lawyer, focusing on boundary and land title related issues. He has written numerous articles, co-authored books and taught seminars and courses for lawyers and land surveyors. He can be reached by email at: Izaak@izaak.ca

<http://www.geogratis.ca/geogratis/en/index.html>

Geospatial data available online at no cost and without restrictions!

GeoGratis is a portal provided by the Earth Sciences Sector (ESS) of Natural Resources Canada (NRCan) which provides geospatial data at no cost and without restrictions via your Web browser.

The data will be useful whether you are a novice who needs a geographic map for a presentation, or an expert who wants to overlay a vector layer of digital data on a classified multiband image, with a digital elevation model as a backdrop.

The geospatial data are grouped in collections and are compatible with the most popular geographic information systems (GIS), with image analysis systems and the graphics applications of editing software.

NEWS FROM 1043

Changes to the Register

MEMBERS DECEASED

Douglas E. Magee	1181	Oct. 5, 2012
James Campbell	1192	Oct. 6, 2012
Ian McLaren	1335	Nov. 18, 2012
John C. Robertson	968	Dec. 4, 2012

MEMBERS REINSTATED

Gordon McElravy	CR101	Nov. 7, 2012
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COFA REVISED

Was: Jewitt and Dixon Ltd.

Is: Jewitt and Dixon Ltd (a Division of Kim Husted Surveying Ltd.) Simcoe, Oct. 16, 2012

Was: I.M. Pastushak Limited

Is: I.M. Pastushak Limited (a Division of J.D. Barnes Limited) Downsview, Nov. 1, 2012

Was: J.B. Fleguel Ontario Land Surveyor

Is: J.B. Fleguel Ontario Land Surveyor (a Division of Donevan, Fleischmann, Petrich Limited) Lakefield, Nov. 6, 2012

Was: Stel & Geyer Professional Surveyors Inc.

Is: Rodney Geyer, Ontario Land Surveyor Inc. Everett, Nov. 26, 2012

Was: Izaak de Rijcke, O.L.S.

Is: Izaak de Rijcke Surveying Inc., Guelph, Dec. 10, 2012

RETIREMENTS/RESIGNATIONS

Lawrence G. Woods	1135	June 15, 2012
Norman Beck	CR83	Oct. 16, 2012
Reid J. Wilson	1484	Oct. 31, 2012
Roger C. Bruneel	CR117	Dec. 12, 2012
Robert T. Force	1436	Jan. 1, 2013

COFA'S ISSUED

CofA for **Grange W. Elliot Ltd.** was suspended on Nov. 12, 2012 and reinstated on Dec. 7, 2012.

Surveyors in Transit

Dan J. Cormier is now with **J.D. Barnes Limited** in Ottawa.

Tania Batchvarova is now with **R. Avis Surveying Inc.** in Toronto.

Chris Musclow is now with **J.B. Fleguel Ontario Land Surveyor (a Division of Donevan Fleischmann Petrich Limited)** in Lakefield.

Sase Ramsamooj is now with **Krcmar Surveyors Ltd.** in Thornhill.

Michael Fisher is now with **Public Works and Government Services Canada** in Toronto.

Steven Davidson is no longer with **Tulloch Geomatics Inc.** in Sudbury.

Michael McKechnie is now with **Krcmar Surveyors Ltd.** in Thornhill.

The field notes and records of **Salna Surveying (A Division of P. Salna Company Ltd.)** have been sold to **Krcmar Surveyors Ltd.** however, the company will maintain its CofA.

Martin Baya has changed his office phone number to 519-873-4530.

Steve Vollick has changed his office address to **ATCO Electric**, 9717-97 Ave., Grande Prairie, Alberta.

Lloyd & Purcell has purchased the notes and records of **David Anschuetz, O.L.S., D.E. Norris, Anschuetz & Norris Ltd., and Barcham & Anschuetz.**

Peter T. Raikes is now the managing OLS at **Eplett Worobec Raikes Surveying Ltd.** in Barrie.

Tom Jones is now the managing OLS at **McIntosh Perry Surveying Inc.** in Perth.

Timothy Hartley is now with **Hook & Todgham Surveying Inc.** in Chatham.

Tom Czerwinski is no longer with **Land Survey Group** in Toronto.

BIM Ready Topographic Surveys

By Jeffrey Lyons, AEC Solutions Business Unit

A Brief Look Backwards at Survey Innovation

One of my first jobs in the Civil Engineering field was working with an Ontario Land Surveyor (OLS) in a small surveying firm in Durham Region; it was 1988. It was there that I witnessed the relatively quick transition from tapes, theodolites and hand drafting to data collectors, total stations and CAD.

Innovation in the surveying industry over the last 30 years has been significant. The continuous improvement in surveying technology since 1988 could be compared to the computer industry in many ways. Every few months, new hardware, software and digital processes were introduced to the traditional surveyor and if adopted, could increase field productivity, calculation time and plan creation dramatically.

In the mid 90's, while working for a land development engineer, I started to see incoming topographic surveys from ground-based GPS-related systems. The turn-around time, the density of points and overall quantity of incoming data was something that the engineering clients wanted to see. The equipment sold to the surveying profession was starting to infiltrate the construction surveying market and other engineering groups that used to outsource surveying.

Affordable desktop computers and CAD-based plan production was the status quo in the late 90's; engineers were primarily getting text ASCII files (PNEZD) and AutoCAD Drawings (lines, arcs, circles, points, and text) as a deliverable from the surveyor. No matter what technology was used to pick up the data, the end result was generally something that looked like the same product being created with ink on Mylar. OLSs were required to ensure the same standards of the hardcopy plan product no matter what technology was used to create it.

Within the last 10 years, advancements in the Internet, wireless communications, remote sensing and photo mapping technology have created a shift in the ground-based surveying business. From my perspective, one of the most dramatic innovations was the release of Google Earth. Everybody on the planet started using maps, every website had a map link, and recently, every new "app" has some sort of positioning system that links you to a map screen. Google had created a programming "cloud based platform" which allowed even hobbyist programmers to start building map applications with data linked to those maps. Bringing maps into the workplace meant surveyors needed to start providing survey datasets which "matched" associated GIS mapping, including Google. Engineers and construction

surveyors started talking about coordinate systems, with little understanding and lots of confusion.

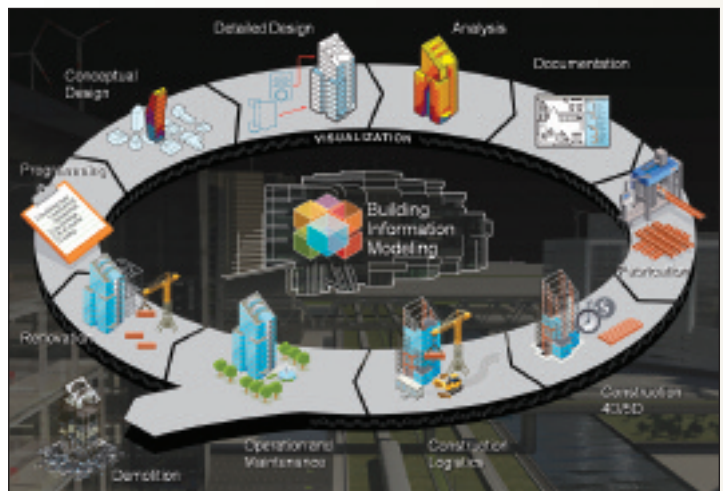
The second major advancement, which is starting to move into mainstream engineering, is LiDAR. In my view, the concept of air and ground based LiDAR surveying will be the "next big thing" where field productivity is again increased, and datasets are even bigger than imagined (millions, possibly billions of points). Unlike Google, I am unaware of an open development platform or "cloud-based" technology that supports LiDAR datasets in a way that Google Earth might support photo, DEM Data and various GIS layers. So the delivery of a LiDAR-based "product" is the solution for the surveying professionals who want to adopt this technology...

Software, Hardware and Data Processing, all built by the surveying and mapping community – true innovation! *Have we seen any BIM yet?*

What is Built Information Modeling (BIM)?

The definition of BIM states "*An integrated process built on coordinated, reliable information about a project from design through construction and into operations*".

So what does surveying practice have to do with BIM?



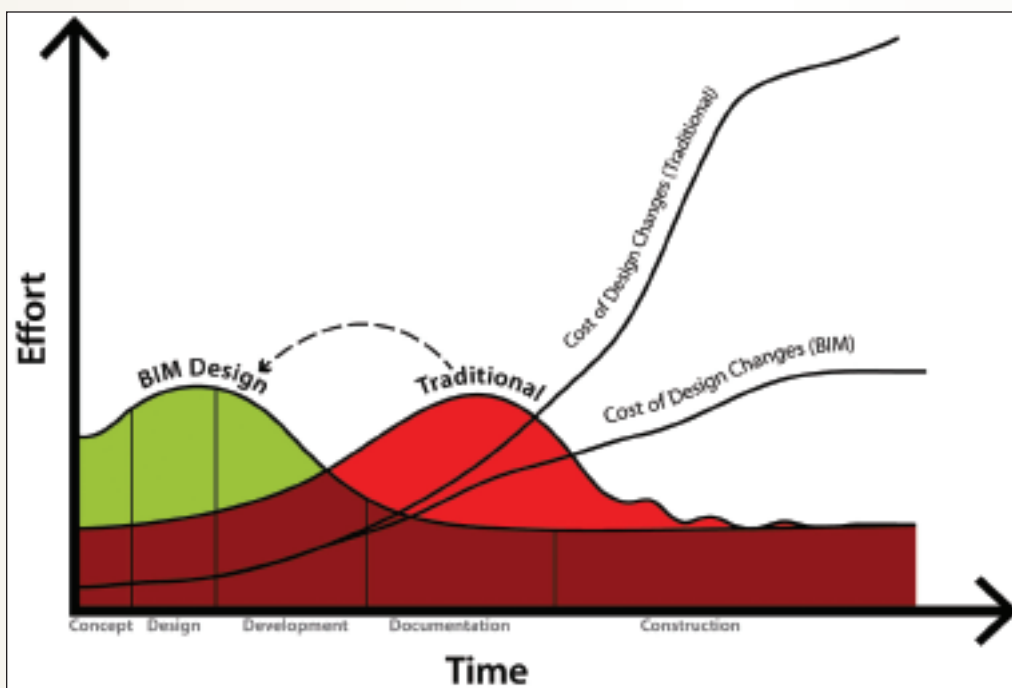
The BIM Data Lifecycle Model

While surveyors were innovating in their own way, engineers and architects were busy working with the same CAD Tools in the 80s and 90s. Mechanical Engineers were probably the first to adopt the process of "modelling" in "3D" for part design and assembly. They had early success in creating accurate 3D models for the purposes of simulation and manufacturing (CAM) production. Architects soon

followed with affordable desktop solutions which resulted in models of actual buildings. The term “Building Information Model” was born. Originally, the concept was around an architect digitally creating a model of the building, and then sharing that model with the sub-consultants and ultimately the construction firm. You could design HVAC, Plumbing, Electrical and many other internal designs within the same model ensuring a minimum of construction issues and budget overruns.

Key Benefits of the BIM Process

- Design-related benefits would include Visualization, Simulation and Analysis during the design phase of a project.
- Construction-related benefits include accurate project wide item estimating, visualizing a construction schedule and costs (4D & 5D Analysis) and reduced or eliminated errors during construction process.
- Owners save money, Contractors keep more money and Designers can sleep at night knowing they have created a better design that can be built with much lower risks.



So what about Civil Engineering and infrastructure? Over the last 3 years, municipal and land development engineering firms have been transitioning from 2D CAD and spreadsheets into a model-based environment, which has significantly reduced 2D drafting and redline revision. For the first time in 20 years we can actually look at using low cost visualization and detailed analysis on every project, from checking for interferences between pipes and utilities within seconds to developing new tools and processes which connect design spreadsheets with BIM objects. It’s been a transition that requires commitment from every designer and corporate support at the highest level.

Disconnected Collaboration

As we develop our own BIM process and experience the benefits we see a disconnection with others in our design eco-system. We are constantly managing incoming survey data, making it fit, and designing on top of it. Exporting data to others including surveyors is a painful experience, when there are no guidelines or policies. This disconnected environment is the single most disappointing aspect of the movement towards BIM. In many cases we are seeing that the infrastructure construction industry has almost bypassed the surveying and engineering dysfunction by building processes outside the project data model to support their own innovation in estimating, automated machine control and layout. Why? The simple answer is, we are not moving fast enough for the construction industry.

Is it because we don’t have the technology? No. Is it because we don’t have the right innovative attitude? No. It’s probably because there is a lack of communication between surveyors and engineers.

Surveyors and engineers have a lot in common, maybe too much. We tend to play it safe, work in a bubble and deliver a

solution to our clients with the best intentions. We could generally get away with that before this concept of BIM. This process demands that we work closely with others in a different way. The moment we start communicating with BIM in mind is the day that our lives start to become easier and project design, layout and ultimately construction starts to experience the benefits of BIM in infrastructure.

What is BIM Ready?

We have already discussed that both engineers and surveyors are working with new technology to improve their internal processes resulting in some form of data that can be shared seamlessly. Even if processes to create data improve,

it seems that engineers are still getting survey data that is 2D and conversely, engineers are still providing data to surveyors in a non-standardized format. In the end, when it comes time for construction, contractors are just digitizing or re-modelling our approved design plans (worst case scenario) and laying it out themselves.

So what would it take to work with engineers? Not much more than you are already doing - we need the following drawing “objects” and/or “entities”;

- Accurate 3D surface (DTM) from ground survey with spot elevations, breaklines and boundaries,

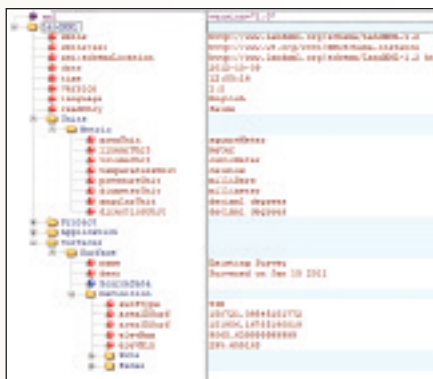
cont'd on page 10

- Underground Features - existing manhole structures and pipes,
- Aboveground Features - 2D Planimetric Point features (trees, poles, hydrants, etc.)
- Standard 2D line work and text showing Planimetric features (fences, building pads, legal and property boundaries, etc.)
- Having all of this in a pre-defined coordinate system that matches GIS and orthophoto datasets.

Lastly, being able to download a dataset and start using the “survey” for engineering purposes minutes after receiving the files is considered BIM Ready. Having some confidence that we can then send surveyors smart surfaces and points would also be our part of the BIM Ready process.

Open Design Data Interchange Format - LandXML?

We discussed that the delivery of BIM Ready data in a single packaged download, providing traditional 2D CAD Drawings (Models and Sheets) with a supporting LandXML Design



file containing surfaces, pipe networks, parcels, alignments, profiles, points and breaklines might be the kind of open format this process dictates. In 2012, the CAD Platform can be pretty much anything (DWG or DGN); the importance of developing a process on a global standard like LandXML (www.landxml.org) means design collaboration within the surveying and engineering eco-system can happen regardless of the CAD Platform.

BIM Ready means Added Value

Promises of increased productivity and lowered costs were achieved in the 90s, survey crews got smaller and competition got bigger... in some cases, fees and perceived service value decreased significantly with the introduction of technology within the surveying profession.

I have just explained briefly what might be considered BIM Ready. The reason we need accurate survey data is for the creation of

profiles, sections, earthworks volume calculations and existing design constraint. Connecting proposed networks with existing pipe networks is considered a bonus.

This same data, if provided correctly, can then be used in our “value added” services such as rapid visualization and clash detection between existing and proposed design objects. Currently, the time for engineers to create and manage incoming project survey data is significant. Our clients pay for this data collection, management, creation and re-do. We can significantly reduce this cost to clients (or our own internal budget overruns) if data management is controlled. The delivery of this BIM Ready dataset is valuable and is worth something to those who request it. Surveyors are actually best suited to create these existing ground and feature models, and can charge those services as a value added component to the cost of a survey “product”.

Productizing your BIM Ready Services

If the survey profession defines a BIM Ready “product” or series of products with standardized content and delivery, our design eco-system can respond with refining their own internal practises with confidence.

LiDAR - Going back to the conversation about LiDAR, this technology is positioned to be BIM Ready. Engineers need a survey data product so they can do their work, how we get that data can be from LiDAR Point Clouds if the survey community can ensure its quality and completeness. Developing a cloud based platform for LiDAR data delivery is indeed another subject... but equally as important when looking at LiDAR data as a product to non-LiDAR ready data consumers.

Data Management - Having our project surveyors manage incoming data from a large project with some knowledge of what we need is critical. Getting emails with partial surveys overlapping is not BIM Ready. Having a complete survey with a surface object representing the growing or changing site is what we would consider BIM Ready.

Asset Management - Our municipal clients stand to gain



Actual Model created using Survey Datasets, AutoCAD Civil 3D Design, Trimble Sketchup and then “rendered” using Adobe Illustrator.

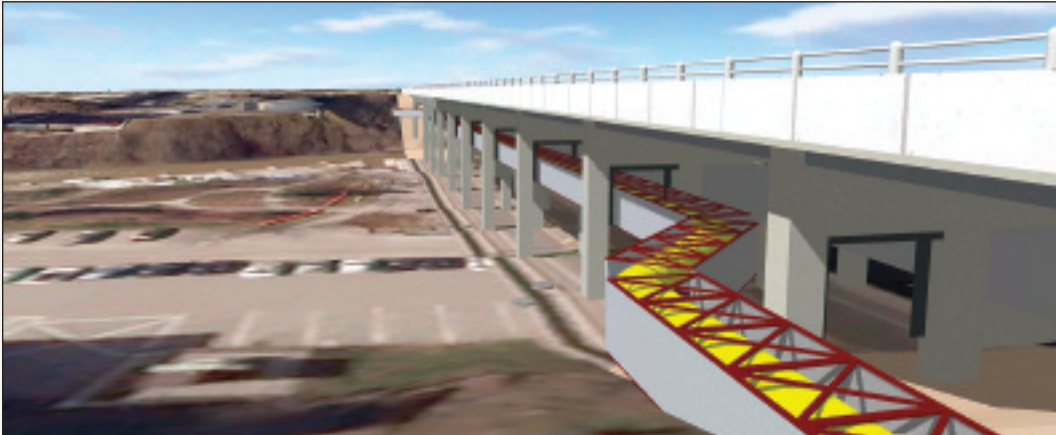
the most, as any As-Constructed survey datasets can be productized and added to asset management databases directly after construction and if considered BIM Ready - should not have to be re-surveyed. Basically, we provide design properties and you provide location properties both horizontal and vertical.

Next Steps...

When we moved from Pen and Ink into CAD, the industry took some time to come to grips with the change. The movement towards BIM and a more collaborative environment with outsiders means once again that we will be moving out

of that comfort zone and into an environment of change and disruption.

Our clients are depending on us with this positive change, and as before they can help by mandating a pre-defined process like they did with CAD Standards. I think as an industry we are well positioned in 2013 to start talking seriously about BIM Ready standards. Having our clients involved in the process early on will ensure that all stakeholders are invested and committed to something that will take our professions to the next level of quality and value.



Jeff Lyons is the AEC Business Unit Leader at Cole Engineering Group in Markham. His business unit is focussed on BIM related processes and services as it relates to the Infrastructure industry. Prior to joining Cole 3 years ago, he was working as the Civil GIS Technical Sales Exec for Autodesk in Ontario, focused on the adoption of Civil 3D throughout the province. He can be reached by email at jjlyons@coleengineering.ca

Actual Model created using Survey and Mapping Datasets, Regional GIS Datasets, AutoCAD Civil 3D Design and then consolidated using Autodesk Infrastructure Modeller.

The Alleyway Project

By David Lamont, O.L.S. and Dasha Page, O.L.S.

Overview of Problem:

In 2001, the City of Hamilton amalgamated with the historic centers of Ancaster, Dundas, Flamborough, Glanbrook and Stoney Creek and became the tenth largest municipality, by population, in the country. This merger provided for a single administration of sustainable services and municipal infrastructure over 112,000 hectares of property between the beautiful Niagara Escarpment and the bay of Hamilton.

An Asset Management solution provided by Hansen Technologies was adopted to manage the linear infrastructures, such as water, sewers and road maintenance in 2002. This improved the delivery of public services to residents of the newly formed city. Hansen was developed to give city employees the capability to access work orders, customer service requests and asset groups, which allowed quicker response to customer requests and built a larger inventory of assets. All the assets in Hansen are assigned an identification number and are tracked based on that unique ID number. Each feature has a spatial component, either point line or polygon.

However, alleyways seemed to be orphaned and in many cases were left completely unaccounted for. Prior to amalgamation, the six communities all had different approaches to tracking or recording the status of alleyway maintenance. Some had created individual files for specific alley projects. Others marked up maps with references to by-laws passed to maintain certain alleyways and the status of surface conditions existed yet again somewhere else, spread across multiple departments and office locations around the city.

The City of Hamilton needed the same one stop source to

answer all the questions that pertain to public alleyways that Hansen already provides for other assets. The challenge was to assemble all this data into a single database that could be placed on the City website or imported into the Hansen system. Having a central database would allow different departments within the City access to all the available information resulting in increased productivity and better maintenance decisions.

The City of Hamilton consulted with Mackay Mackay & Peters Limited (MMP) to determine the scope of the work and processes required to assemble the alleyway data in the most efficient way, while maintaining data accuracy and the City of Hamilton's applications. A unique solution was designed in a few meetings between the City of Hamilton, MMP and MMP's GIS specialist TTB Consultants.

Solution Opportunity:

As a starting point, a custom Land Registry data extract was obtained from Teranet. This extract included title information related to all potential "Roads, Alleyways or Lanes" within the City, accompanied by the parcel polygon data for the related parcels. However, the raw data provided too many false positives, identifying some 13,000 parcels as having met the criteria. Effort was exerted to parse information from the legal description to note instruments or documents which may reference by-laws, closures or restrictions related to the Alley. As detailed research on a parcel by parcel basis would take the project well past its delivery commitment, it became clear that a further prioritization and categorization of the affected parcels would be required to focus energies only on those parcels requiring physical research.

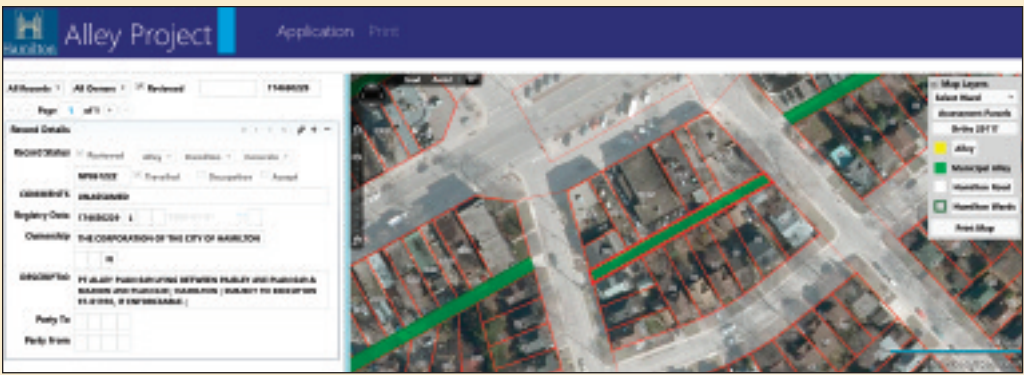
Method:

The Land Registry information was combined with data from the City of Hamilton's GIS system (Road Layer, Parcel Layer) and incorporated into a Microsoft SQL Azure cloud environment. The environment allowed data mining and data correlation techniques to be applied to the data using both attribute and spatial processes which categorized the data. The categorization took the 13,000 records down to a manageable 600 records. These 600 records were potentially Alleys within the City but more detailed research and analysis needed to be done to authoritatively define their status.

To review and analyze the records, a web application was created that facilitated field editing over the web. The City deployed a web interface to support updating or modifying the records in the field through a set of basic mapping functions. This online database was accessed by MMP to update the records while the City's staff were able to view the

cont'd on page 14





changes and monitor the progress of the project in real time. By providing both the information and mapping in a read/write environment, it allowed those involved in the research and information gathering process to take advantage of GIS technology.



Results:

Key to the success of the project was the filtering of the initial record set to fewer than 600 candidate alleys and the rapid inspection and update ‘feedback’ provided by MMP. By combining the Assessment Parcel with the Ownership Parcel that is tied to the City’s own Roads index allowed the City to create and distribute the work with a healthy dose of automated analysis against the legal description. The application was customized in an iLOOKABOUT GeoViewPortⁱ environment with the data records, available orthoimagery and StreetScapeⁱⁱ imagery, to create a desktop review platform that provided the City and MMP with the necessary tools to expedite and validate the project. The StreetScape imagery proved to be an excellent tool in reducing the number of site inspections required. MMP subsequently accessed supporting information such as By-Law maps, title registers and title documents from within Hamilton’s environment to complete the database.

The project is a successful example of a creative collaboration. All of the companies played an important role in this consortium by

pooling their efforts and devoting their unique expertise to the task while still maintaining a mutual approach to its completion. A surveying company pressed into action to achieve satisfactory results without performing field work, combined with a technology-based company that could quickly assimilate data from multiple sources and modify their

application to facilitate viewing and updating information on the fly, was the perfect combination supported by City staff who were more than capable of sourcing raw data to actualize qualitative precision.

The net result is 530 City-owned alleys and 89 privately owned alleyways. The next steps are to load all of these features into Hansen’s system and finalize the attributes and start processing work orders.

We are all happy to say that this project was completed in a timely manner and within budget.



David Lamont, O.L.S. is Senior Project Manager, Public Works Department, Engineering Services Division, Geomatics and Corridor Management Section at the City of Hamilton. Contact David at David.Lamont@hamilton.ca

Dasha Page, Hon. B.Sc., O.L.S. is the General Manager at Mackay Mackay & Peters Limited in Burlington. Contact Dasha at dpage@mmplimited.com

Aiding in the project was MMP’s GIS consultant, **Tim Hu**, the principal of TTB Consultants Inc. Tim’s role was to organize the data and design the web application around the project. Contact Tim at tim.hu@ttbconsultants.ca

ⁱ iLOOKABOUT is a geo-coded image product that helps any commercial enterprise explore, map and manage their world with visual data they can trust for accuracy and integrity and has also launched GeoViewPortTM, a web-based Geographic Information System (GIS) application that enables the federation of additional value added data such as validated addresses, aerial imagery, property values, property attributes, etc. with StreetScape imagery.

ⁱⁱ iLOOKABOUT is a pioneer in visual and data intelligence with its StreetScapeTM.



MTO Provincial Highways Management Division 2012 PIER Awards “Carl Hennem Lifetime Achievement Award” John Ward

The following speech was delivered by Kathryn Moore, Regional Director, MTO Eastern Region on October 3, 2012

John Ward, a good friend, a mentor, a colleague, passed away on May 12, 2012. I was honoured to make this nomination of John for the 2012 PIER Award in the category of the “**Carl Hennem Lifetime Achievement Award**”. I believe John’s career through the public and private sector reflects the best of the values embodied by this Award. These values are commitment to public service, excellence, innovation and openness to change, proactive leadership, sustainability, team approach, and valuing people.

I met John in early 2002 when he joined MTO as a Project Surveyor in our Eastern Region Geomatics Section. Our first conversations took place over a number of long nights the first week of the 2002 strike when we shared some scheduled duty. I remember thinking over and over again to myself, “Wherever did we find this remarkable person?” John’s experience and life journey and his interests and thought processes were delightfully different from our MTO norm. Our rambling conversations were about culture and change management, business strategy, engagement, innovation and facilitation; not the usual fodder for casual discussion around the office in the middle of the night.

John’s career journey leading to MTO had taken him from the very first graduating class in surveying at the University of Toronto, Erindale College, through working with and owning

a number of survey firms in various parts of Ontario... to a career in teaching adult education upgrading at Northern College, and surveying at Humber. He was also growing in his role with various volunteer activities with the Association of Ontario Land Surveyors. His work with his professional association was a source of great interest, commitment and pride for John.

In New Liskeard, John decided to pursue his passion for business strategy and business change. He taught himself the principles and practice of change management and developed the consulting firm, Growth Management Technologies. John’s experience with change management and interest in project management was well formed by the time he joined MTO.

In his ten years at MTO, so much of John’s influence and impact came from the ability to help others crystallize directions and action plans. John had this marvellous ability to help people move a swirling mass of ideas and concepts into action, by bringing people together with respectful facilitation that was practiced with gentle humour... and subtle questioning and suggestion. John was skilled at leading people to conclusions that all could support, and even more so, that people could champion. He knew how to manage the complicated and quirky process of innovation.

John approached his work with a deep ethic of service and excellence. His search was for the very best we could do to improve the value of the efforts we made for the citizens (and taxpayers) of Ontario. He ensured the operational work of his Office was fully aligned with OPS, MTO and PHM Division directions, and he ensured his staff fully understood this alignment, and why and where their role was important. The emphasis was on excellence in service, collaboration for collective success, the use of our technical capability to help us visualize and locate our information in useful ways to do our work faster and greener.



Presentation of the Carl Hennem Lifetime Achievement Award to John Ward’s family, left to right: Steve Cripps, Executive Director/Chief Engineer, Sheron Ward, Michael Ward, David Ward, Kathryn Moore, Regional Director, Eastern Region, Gerry Chaput, Assistant Deputy Minister, Provincial Highways Management Division.

And John enhanced this value by creating the foundation and support for staff to exercise their individual and collective creativity and innovation. I frequently refer to the Geomatics Section as a constant nuclear explosion; in the most positive sense. Ideas and actions growing and expanding and then landing with improved products and services.

As part of our PHM **Be Bolder** Innovation agenda, John was also the driving force behind the upcoming MTO Innovations Program workshop “Managing for Innovation”, designed to help PHM managers identify and understand how to manage innovative projects for success. John is the 2012 Innovations Team All Star #2 – the Innovation Facilitator. ...and in the months before he passed away he had just started working with the Ministry of Health and Long Term Care to bring this learning to the team charged with transforming doctors’ fee claims.


John’s approach to change and the facilitation of change were brilliantly demonstrated with the work he led for us in developing our approach to Asset Management and in the Functional Review of Geomatics, both efforts across the Division and with many clients that has positioned PHM and MTO well for the future. His skill as a facilitator with the OPS Facilitators Network was sought out for activity as widely ranging as Government Budget consultations, workplace issues mediations, and the OPS Neighbours, Friends and Families campaign; with this latter work one of the very few men leading discussions on violence against women. This selfless giving back to the OPS was seldom seen inside MTO but highly valued across the Ontario Public Service.

The values of respect, fairness and integrity that John lived by every day were the reason his entire staff group nominated him for the 2011 PIER Award for Valuing People, a nomination this humble and gentle person agreed to only because he believed it would bring recognition for his staff, and once won, an award he attributed to **their** demonstration of these values.

There was never any doubt that the people that brought a sparkle of joy to his eyes were his family and his friends. You can see from the photos behind me a man who cherished his time with Sheron, Mike and Dave and other family... and from the many stories I have now heard, a good, generous and very kind friend to so many.

I have been a Director for 20 years and have seen many leaders and managers and many workplaces. John Ward was a rare individual in my experience; highly focused on business delivery, setting very high expectations and working to ensure people could meet them and realize their purpose, but actively encouraging and managing change and innovation, every day developing and unleashing the potential of the people all around him. While the lines of authority were very clear, this is a workplace where everyone believes they are family; that they are John’s family.

John was a restless spirit who practiced patience with all of us... and those of us who learned to be patient with the mental journey he took us on... are very enriched for it.

I was proud and pleased to make this nomination of John Ward for the “**Carl Henum Lifetime Achievement Award**” and so very, very heavy of heart that this was a posthumous nomination. 

3D Imaging

By Costas Armenakis, PhD, P.Eng., Julien Li-Chee Ming, MSc, PhD Candidate and Ravi Persad, MSc, PhD Candidate
Geomatics Engineering, GeoICT Lab, Department of Earth and Space Science and Engineering, York University

3D spatial representation of the real world has always been one of the main objectives of mapping. However, most of the time 2D or 2.5D representations are being used to represent the 3D world. For example, in topographic maps the elevation is represented by 2D contours and in GIS the elevation is represented as a feature attribute. The 2/2.5D representations require additional cognitive effort and computations to allow for straightforward visualization and 3D calculations related to the physical size and shape of an object. Recently geometric and photo-realistic accurate three dimensional (3D) models of landscape scenes and objects have been gaining significant attention. These “realistic representations” are becoming vital to better modelling, analysis and scene understanding. 3D models serve as replicas of the real world and can be used for urban applications, digital terrain modelling, facilities management, telecommunications, transportation, infrastructure engineering, reverse engineering, decision-support, emergency services, tourism, architecture and preservation of cultural artefacts, integration of GIS and CAD and generation of augmented reality environments. The main stages of 3D modelling are: a) data acquisition, b) 3D object reconstruction, c) 3D virtual model generation by photorealistic texture rendering, d) analytical computations and e) interactive visualization of the virtual model and results on a computer or via web-mapping.

3D imaging can be defined as the 3D visual representation of the imaged scene and objects using passive and active sensors. 3D imaging techniques can be direct or indirect. Direct techniques refer the use of active sensors to directly measure the X,Y,Z coordinates of the object shape; indirect refers to use of passive sensors and the determination of the object shape through some process. A camera is a passive sensor as it records the electromagnetic radiation reflected from an object, while Light Detection and Ranging (LiDAR) is an active sensor as it transmits its own energy and receives its backscattered signal. The following are some examples of 3D imaging systems and techniques.

3D imaging using cameras

Single view cameras capture 2D images of the 3D space. The third dimension of space can be recovered photogrammetrically using two or more camera views of the scene, either simultaneously (stereoscopic coverage and stereo-

viewing) or by using a single moving camera capturing multiple overlapping views (photogrammetric triangulation and structure from motion). In both cases, dense sets of corresponding points are measured across the images using image matching techniques. The rays determined by the perspective centre of the cameras and the 2D image coordinates of the points can be intersected in space to provide the 3D locations of the image points of the scene (or object) using a photogrammetric bundle adjustment solution. These 3D photogrammetrically derived point clouds can be texture mapped based on the image pixel values, forming a point-based photorealistic 3D shape representation. Furthermore, a surface triangular mesh (TIN) can be generated from the 3D point cloud, followed by the mapping of the image textures to the mesh triangles, thus resulting in a photorealistic surface-based 3D surface representation.

A low cost stereo-metric mobile mapping system has been developed at York University (Figure 1). Its stereo-viewing

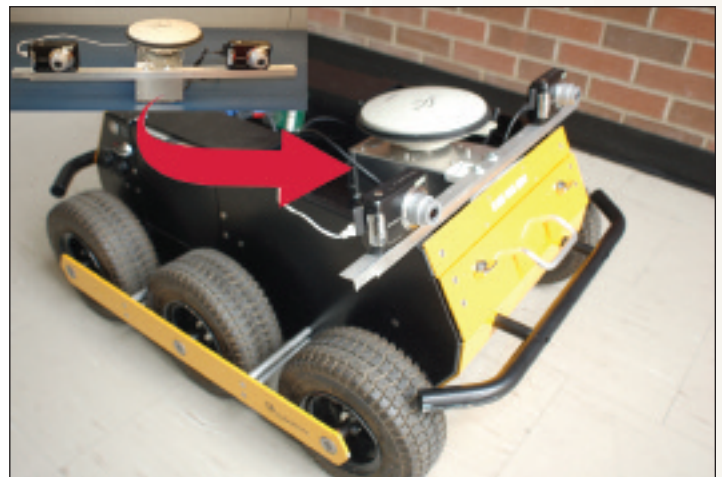


Figure 1: The mobile stereo-mapping systems onboard the Husky A200 UGV

mapping sensors are two Canon A480 digital cameras. The system uses onboard navigation sensors to determine the position and attitude of the stereo imaging sensors. 3D mapping coordinates are determined using photogrammetric solutions modified for direct georeferencing.

An example of 3D imaging using the structure from motion approach with still images taken from a mobile platform is illustrated in Figure 2. While the sparse point cloud does not reveal any object shapes, in the denser point cloud we are able to distinguish the trees, pavement surface and the sidewalk curb.

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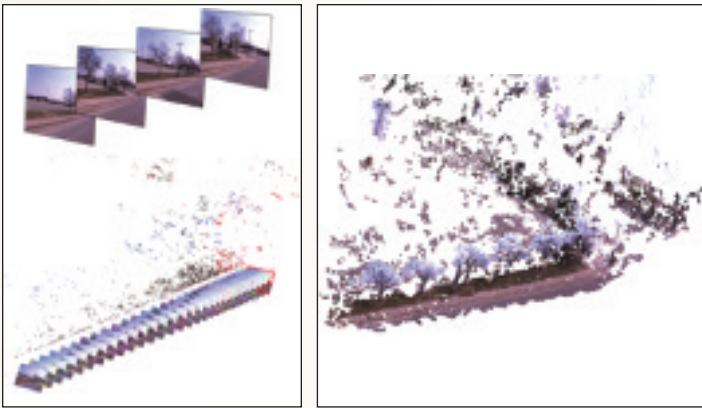


Figure 2: Structure from Motion. (Left) Sparse 3D point cloud; (Right) Denser 3D point cloud

3D imaging using LiDAR

Aerial, terrestrial, and mobile LiDAR systems use an active sensor - a laser scanner measuring range and direction - to collect patterns of dense 3D point clouds, forming a point-based 3D image of the shape of the scene. Dense point clouds are required to derive certain semantic information about the objects in a scene. The 3D point image can be texture mapped using, for example, the distance to object, the timestamp, or the height from the ground (Figure 3). A 2D image can be also generated using the

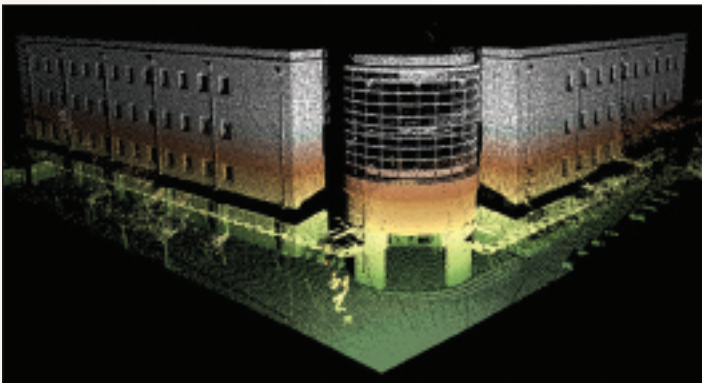


Figure 3: Colour-coded terrestrial LiDAR point cloud based on height (credit: Langyue Wang, PhD candidate, York University)

distance to object as its pixel values by interpolating the 3D points at a regular gridded pattern. The LiDAR scanning provides an additional image called intensity that represents the strength of the reflection of the signal from the target. The intensity image is spatially referenced to the coordinate



Figure 4: LiDAR digital surface model (DSM) (Left); LiDAR intensity georeferenced image (Right)

system used and can provide useful semantic information about the shape of the objects (Figure 4).

3D imaging using cameras and LiDAR

Digital imagery and high-density LiDAR point clouds data can be combined to generate geo-referenced photo-realistic 3D building models. An example is presented here illustrating the point cloud registration and geo-referencing, the building surface modelling and the building surface texture mapping. The point clouds were collected by the ILRIS-3D TLS laser scanner with an average point spacing of 1.5 centimetres. The imagery was captured with a Nikon D9 digital camera attached to the LiDAR system. Multiple scans, covering the building object from different view-points were co-registered using automatically determined tie points to create a digitized object with complete surface coverage (Figure 5). Distance images were generated from

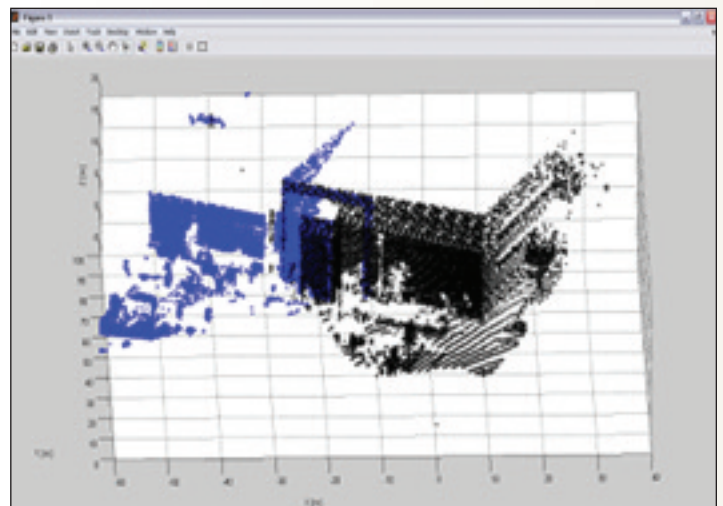


Figure 5: Registered point clouds

the 3D LiDAR point clouds, where each pixel is populated with a range-based intensity value (Figure 6).

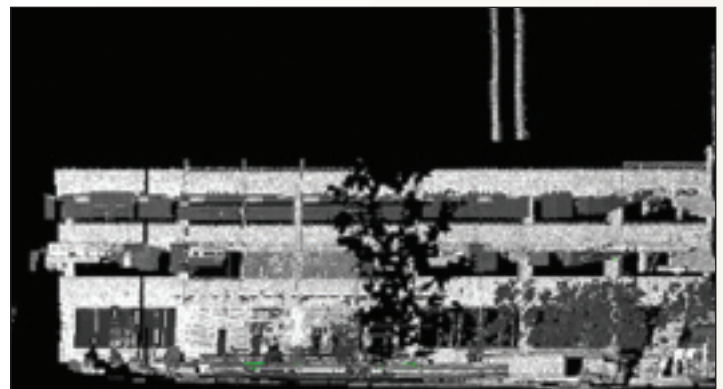
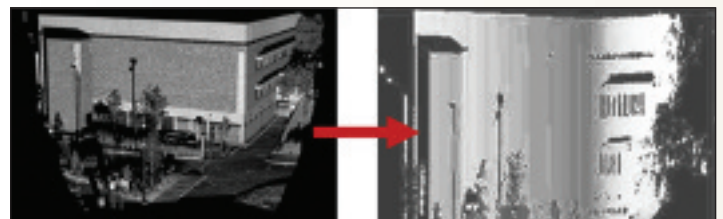


Figure 6: 2D range image of the point cloud

Upon generating the images of two overlapping point clouds, an image matching algorithm is applied to detect and match distinct features common to both images. Through georeferencing, the local coordinate system of the point cloud is transformed to a user specified geodetic coordinate system using known control points in the geodetic coordinate system. An automatic target recognition algorithm was implemented to identify these control points in the point cloud. Planar features of the building were automatically detected using a region algorithm and the 2D range image of the point clouds. The relative position and orientation of the camera coordinate system with respect to that of the laser scanner was determined through the co-registration of the image and LiDAR data. The red, green, blue (RGB) image textures were then mapped on the surface model through back projections using the collinearity equations. Figure 7 shows mapping the image to the point cloud.



Figure 7: RGB texture mapped point cloud

The 3D model of the Keele Campus of York University (Figure 8) is another example of 3D imaging using aerial digital imagery and LiDAR data together with terrestrial images of the campus buildings and vector planimetric data. The 3D model can be viewed using the Google Earth browser.



Figure 8: 3D building model of Keele Campus, York University

3D imaging using ToF cameras

Time-of-flight (ToF) is a new type of camera active sensor that, in addition to capturing a 2D intensity image of the scene, also provides a distance value at each pixel simultaneously. Therefore, these distance (range) measuring cameras can be used for the reconstruction of the 3D scape of a scene and for capturing the motion of an object. Some of these cameras are capable of video data rates, making them suitable for real-time 3D imaging. These range cameras are still of low resolution and have low measurement accuracy. They have a small field of view and they have limited range, most up to 10m, some up to 60m.

3D imaging technology is already having an impact on the ways we collect, visualise, model and analyse 3D spatial data. It will not be long before we see robotic 3D imaging and scanning total stations becoming common measuring instruments for 3D surveys.



Costas Armenakis, PhD, P.Eng is an Associate Professor, Geomatics Engineering, GeoICT Lab Department of Earth and Space Science and Engineering at York University. He can be reached by e-mail at armenc@yorku.ca for further information.

Calendar of Events

February 5 to 7, 2013

10th Annual ORCGA Damage Prevention Symposium

Niagara Falls, Ontario
www.orcga.com

February 11 to 13, 2013

International LiDAR Mapping Forum

Denver, Colorado
www.lidarmap.org/ILMF.aspx

February 27 to March 1, 2013

AOLS AGM

Together Towards Tomorrow
Toronto, Ontario
www.aols.org

May 6 to 10, 2013

FIG Working Week 2013

Abuja, Nigeria
www.fig.net/fig2013

June 5 to 7, 2013

CIG-ISPRS

Earth Observation for Global Changes Conference
Toronto, Ontario
<http://eogc2013.blog.ryerson.ca>

June 18 to 21, 2013

National Surveyors Conference and AGM

Niagara Falls, Ontario
www.acls-aatc.ca

AOLS Special General Meeting

By David Brubacher, O.L.S., O.L.I.P.

The Association held its first Special General Meeting in many years at the Schulich School of Business at York University this past October 19th. The primary purpose of the meeting was to address the request put forth by the North Eastern Regional Group (NERG) to “provide insight to the membership into the current progress and strategic plan of the ODCC”. Council assigned the task of presenting answers to the questions posed in the NERG letter to members of the Board of Directors of the Ontario Digital Cadastre Corporation (ODCC) and to the Digital Cadastre Task Force.

President Paul Benedict called the meeting to order, and then introduced Executive Director Blain Martin, who set

requesting clarity on a number of points.

Chairman of the ODCC Board Art Leitch made his opening remarks after Mike Tulloch. He expressed his enthusiasm for the opportunities and thanked the Board and Task Force for their hard work over the previous seven months. That hard work resulted in the first contract for ODCC; supplying property dimension reports (PDRs) to the Municipal Property Assessment Corporation (MPAC) to help improve their processes and base assessments of new properties on accurate information supplied by surveyors.

Bruce Baker followed Art with an in-depth discussion of what PDRs are and how to submit them, showcasing a number of processes created for ODCC by its strategic partner,

iLookAbout. To submit a PDR, a firm must sign a Master Services Agreement (MSA) with ODCC, and then sign the Schedule pertaining to PDR submission. The processes were developed and tested in the South Western and Hamilton & District Regional Groups, so some firms operating in those areas have already signed. The remainder of the firms in Ontario will be contacted in 2012 and early 2013 to review and sign the MSA and Schedule and then receive

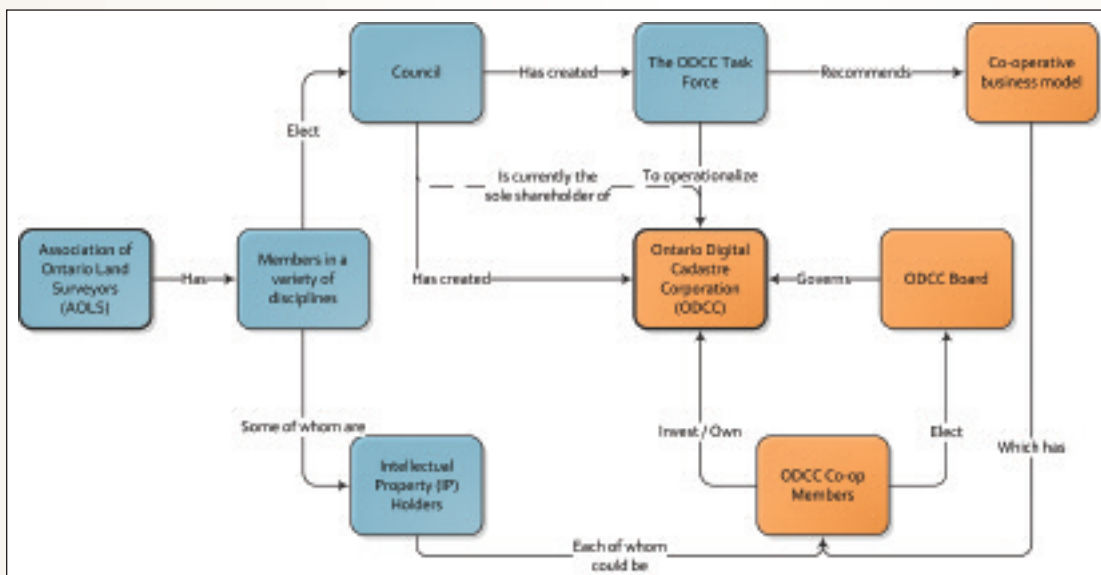


Figure 1: AOLS-ODCC Relationship

the tone for the rest of the day. Blain shared feedback from selected members that ranged from “...concern that again the North is being ignored in this project...” (L. Maughan) to “... full support of this project; I do not want to see our profession lose this opportunity like it has lost others in the past” (E. Grenkie). Ross Clarke’s declaration was accurate and succinct; “While we remain competitors in all respects, we recognize that together we can deliver accelerated improvements in the delivery of surveying services to the public. We stand together to find solutions to the challenges of our profession through innovative and collaborative action.”

Mike Tulloch spoke next, acting as a representative of NERG. He discussed the letter that prompted the meeting, speaking favourably about the opportunity we have created for ourselves, and stressing that the letter was not meant to be antagonistic in any way. Rather, the signatories to the letter want to show their support while at the same time

PDR submission training. Please contact the author at davidb@odcc.ca if you wish to fast-track the process and



The Special Meeting was called to order as the Sergeant-at-Arms, Ryan Seguin carried in the Standard Measure.



Mike Tulloch (left) addresses the audience. Seated at the table (from left to right): Paul Benedict, Blain Martin, David Brubacher, Izaak de Rijcke, Art Leitch, Julia Meldrum Smith and Bruce Baker.

become an MSA signatory as soon as possible.

The next presentation was by Art Leitch and me, where we discussed the current ODCC ownership situation. The Board and Task Force considered many options but determined that creating a structure that stays true to the vision that every Association member should benefit from the opportunities presented by ODCC was beyond its ability. Today there is a single share owned by Council. Council has recognized that this situation must be temporary and on October 12th, 2012, resolved “that Council directs the Board of ODCC to prepare a recommended new ownership and participation structure in which Council of AOLS retains a public interest accountability role and further that this be accomplished by the summer meeting of Council in July, 2013”. The Board has hired experts in the field to help address this need and deliver on Council’s motion.

The final presentation of the morning was by Izaak de Rijcke and me, where we directly responded to the questions posed in the NERG letter. Answering those questions presented an opportunity to provide clarity on a number of



Antoni Wisniowski, President and CAO of MPAC (left) and Art Leitch signing the first contract.

misconceptions. Chief among those misconceptions is what the ODCC actually is.

The ODCC is a company that links cadastral surveyors – the producers of current, high quality, spatially reliable data – with the customers that are eager to consume it. Our software platform is a means to aggregate that data so that it is easily discovered, purchased and consumed. That does not mean going into competition with our members. Instead it means providing the technology to unify the existing services into a one-stop-shop. Through unification and combined with the building blocks we create (PDRs and their successors), an accurate and up-to-date digital cadastre will emerge that paves the way to even more opportunities.

The afternoon was dedicated to questions and suggestions from the floor. There were a number of excellent questions and a few concerns. One of the biggest concerns was regarding both the amount and frequency of communications around the ODCC initiative. A commitment was made by the



David Brubacher (left) and Izaak de Rijcke answer questions posed by the members.

presenters to improve communications and this article is just the first of many. We will also post the videos of the meeting on the website for your review so that you can see and hear all of the presentations in their entirety.

After the meeting, attendees were sent a link to a survey that asked questions about their satisfaction with the meeting and their level of support surrounding the continuation of the initiative. The majority of responses were either fully supportive or cautiously optimistic, with very few negative responses or comments. The results of the survey gave Council, the ODCC Board and the Task Force much needed confidence and direction to continue moving the ODCC forward.

In the New Year, you can expect to see more articles in the OPS, regular bulletins in the AOLS Newsletter, presentations at Regional Group meetings, special meetings in your area to discuss opportunities like the PDR, training, and even one-on-one meetings in your office if desired.



Ryerson Civil Engineering Ph.D. Graduate Wins Prestigious Governor General's Academic Gold Medal

Wai Yeung Yan, a recent Ph.D. graduate from the Department of Civil Engineering, Ryerson University, received the Governor General's Academic Gold Medal at the Fall 2012 Convocation. Yan, an international student from Hong Kong, enrolled in Ryerson's Geomatics Program in the fall of 2008 under the supervision of Dr. Ahmed Shaker. During the last four years, Yan conducted his Ph.D. research "Radiometric correction and normalization of airborne LiDAR intensity data for land cover classification" and published more than 30 papers in peer-reviewed journals, conferences and professional magazines.

"I really enjoyed the time studying in Ryerson. Although we are in a lately established graduate program, I like the cohesion and solidarity we have. I believe we are up and coming!" proudly said Yan. "This award makes a big encouragement for me, Dr. Shaker, and students and friends around me."

In addition to publication, Yan did actively participate in competitions to demonstrate his good work. He won 12 national/regional awards in the best student paper, poster and presentation competitions, among which are the five prizes from the AOLS Educational Foundation sponsored



Dr. Shaker (left) and Yan (right) at the Fall 2012 Convocation at Ryerson.

Graduate Student Poster Competitions: 1st (2009), 1st and 4th (2010), 2nd (2011) and 3rd (2012). "I am very thankful for what I have, and I do appreciate the support and encouragement from the AOLS, in particular Maureen, not only for me personally, but also for my program." said Yan. "I believe both the AOLS and Ryerson are creating the future geomatics professionals whose impact on society is much stronger than what we realize."

This prestigious Governor General's Academic Gold Medal award recognizes the



Yan's 4th place poster (2010 AGM) is pictured at the far left and his 1st place poster is directly beside it on the right.

overall excellence in academic achievement in graduate studies and is provided by the Chancellery of Honours in the Office of the Secretary to the Governor General of Canada. A more detailed description of the award can be found at: <http://www.gg.ca/document.aspx?id=187>.



- (v) None of the eight files reviewed contained sufficient documentation regarding the member's communication with his client, contrary to Section 4(1) of O. Reg. 216/10 of the *Surveyors Act*;
- (d) The eight plans reviewed in Mr. Plaxton's Comprehensive Review contain numerous other issues which demonstrate a general lack of knowledge of or a disregard for the Statutes, Regulations, Guidelines and other rules related to the practice of cadastral surveying thereby constituting professional incompetence pursuant to Section 26 (3)(a) of the *Surveyors Act*;
- (e) Mr. Plaxton failed to meet any of the due dates required for his submissions to the Survey Review Department, neglected to contact the department prior to said due dates, and on several occasions failed to respond to the questions raised by the manager of the Survey Review Department in a timely and professional manner, contrary to Section 34(2)(g) of Regulation 1026 of the *Surveyors Act*;
- (f) The Registrar considered that the deficiencies noted in Mr. Plaxton's review were of such a serious nature that they warranted a referral to the Complaints Committee of the AOLS;
- (g) In the Reasons section of the Complaints

Committee's Decision for the said complaint, the Committee noted that Mr. Plaxton's work did not meet AOLS standards, thereby constituting a contravention of the Code of Ethics set out in Regulation 1026 of the *Surveyors Act*;

- 5. It is alleged that the member failed to comply with the *Code of Ethics* of the AOLS in that he has repeatedly failed to abide by the standards of practice which is contrary to Section 33(2)(b) of Regulation 1026, R.R.O. 1990, as amended. Failure to comply with the *Code of Ethics* constitutes Professional Misconduct within the meaning of Section 35(3) of Regulation 1026, R.R.O. 1990, as amended.
- 6. It is alleged that the member failed to comply with the *Code of Ethics* of the AOLS in that he signed survey plans which did not comply with all relevant legislative requirements and all standards of the Association, which is contrary to Section 33(2)(f) of Regulation 1026, R.R.O. 1990, as amended. Failure to comply with the *Code of Ethics* constitutes Professional Misconduct within the meaning of Section 35(3) of Regulation 1026, R.R.O. 1990, as amended.
- 7. It is alleged that the member has committed acts of professional misconduct as defined by Sections 35(1), 35(2), 35(3) and 35(21) of Regulation 1026, R.R.O. 1990, as amended, of the *Surveyors Act*.

Dated at Toronto, Ontario, this 18th day of July, 2012.

DISCIPLINE DECISION

IN THE MATTER OF the *Surveyors Act*, R.S.O. 1990,
Chapter S.29, as amended

AND IN THE MATTER OF William Plaxton, O.L.S.

AND IN THE MATTER OF a Disciplinary Hearing
Of the Discipline Committee of the Association of
Ontario Land Surveyors held in accordance with
Sections 26 and 27 of the said Act

Decision and Order

This Panel of the Discipline Committee convened on October 3, 2012. Mr. Plaxton, O.L.S., was present and represented by Counsel, Danniak Baker, Barrister and Solicitor. The Association was represented by Izaak de Rijcke, Barrister and Solicitor.

On convening, the Panel was presented with a Joint Submission as a proposed resolution of the matter.

The proposed Joint Submission, as originally signed by both Mr. Plaxton, O.L.S. and Mr. Bill Buck, O.L.S., C.L.S. and Registrar of the Association was marked as Exhibit 5 to the proceedings. A copy of the Joint Submission as presented to the Panel is attached to this Decision and Order as Appendix A. After considering the proposed Joint Submission, the Panel advised Counsel of certain concerns that it had with respect to the proposal. The parties, through their respective

Counsel, agreed that certain amendments to the Joint Submission were appropriate. The agreed amendments are:

- 1. Paragraph 3 of Appendix A is amended to say:
 - a. that the Mentor will report to the Registrar every **2 months** on the progress and implementation of skills on the part of the Member;
 - b. In addition to the Mentor's role for the first 12 months identified, a Monitor selected by the Registrar and paid for by the Member will further review the work and practise of the Member for a second 12 month period, ending October 14, 2014. The Monitor will report to the Registrar every 3 months during the second 12 month period on his/her observations of the Member's work and

cont'd on page 30

advise whether or not it is of a satisfactory standard;

- c. In addition to the provisions of paragraph 8, in the event that the Mentor or Monitor provides an unsatisfactory assessment of the Member's progress, implementation of skills or work product, forthwith on receipt of such an unsatisfactory assessment the Registrar will refer all matters concerning the Member to Council of the Association for its consideration regarding further action with respect to the Member.

This Panel accepts the Joint Submission subject to the

enumerated amendments noted above, and as agreed between the parties through their respective Counsel.

This Decision and Order may be signed in counterparts, and electronic copies of the Panel's signatures will suffice.

Oral Decision given October 3, 2012.

Gary Auer, O.L.S.

Rick Miller, O.L.S.

Tom Packowski, O.L.S.

Peter Moreton, O.L.S.

Mark Spraggett, Lieutenant-Governor Appointee

APPENDIX A

JOINT SUBMISSION TO DISCIPLINE COMMITTEE ON CONSENT OF ALL PARTIES

The Association of Ontario Land Surveyors (the "Association") and the Member, William Plaxton, O.L.S. (the "Member"), make joint submission to the Discipline Committee under the *Surveyors Act* in respect of this matter by asking the Discipline Committee to issue a consent Order on the following terms:

1. The Member pleads guilty to the charges and allegations of professional misconduct against the Member (the "Charges") as alleged.
2. The Member's Licence shall be suspended for a period of one year from October 15, 2012, such suspension to be deferred for a period of one *year*.
3. The Member shall provide a written undertaking (herein "the Undertaking") that will be signed and delivered to the Registrar of AOLS on the same day as the hearing before the Discipline Committee in this proceeding, that he will co-operate fully with a mentor who will be selected by the registrar and the payment shall be by the Member. That mentor shall supervise the work and practice of the Member for one year beginning October 15, 2012. In addition to overall practice supervision, each project which the Member undertakes shall be discussed and reviewed by the mentor with the Member so as to ensure consistent quality in the end product for the Member's clients. The mentor shall report every 3 months during the one year appointment to the Registrar of AOLS on satisfactory progress and implementation of skills on the part of the Member.
4. The Member shall also include in the Undertaking a duty to enroll in, and successfully complete the courses known as *Survey Law 1* and *Survey Law 2*, or their equivalents, within one year of the date of this joint submission and provide to the Registrar of AOLS satisfactory proof of having done so.
5. The Member shall also include in the Undertaking a duty to immediately adopt and implement office and communications equipment for the Member's practice, so that the Member shall be accessible to the public and to the Member's surveying colleagues. Such equipment shall

include, as a minimum, a telephone number that can record messages which the Member will check and respond to at least once every 24 hours, a fax machine and number and an email address which is checked and responded to by the Member at least once every 24 hours.

6. The Member shall be reprimanded and the reprimand will be recorded on the Register of the Association.
7. The Member agrees to pay to the Association the sum of \$10,000.00 plus HST (\$11,300.00) for costs by way of 12 post-dated cheques, 11 of them for \$1,000.00 and dated November 15, 2012 to September 15, 2013 and a final cheque dated October 15, 2013 for \$300.00, such cheques to be delivered to the Association no later than October 15, 2012. The Association may move for judgment in Small Claims Court for the amount owing or unpaid by the Member and the Member shall deliver a consent to judgment in favour of the Association and to be held by it as further security in the event that any one or more post-dated cheque remains unpaid.
8. The Member shall be required to comply with the terms of the Order or Decision in all respects, failing which, the deferral of the suspension referred to above shall be revoked. The member further undertakes and agrees that the failure of the Member to comply with any aspect of the Order resulting from this joint submission shall be deemed to constitute professional misconduct and serve as a basis for fresh allegations before the Discipline Committee against the Member.
9. The terms of this Joint Submission are fair and reasonable and protect the public interest.
10. The Member acknowledges having been advised to obtain and has had the benefit of independent legal advice.
11. This Joint Submission and agreement thereto by the Member may be set up as a complete bar and answer by the Association to any appeal or judicial review of the Order or Decision of the Discipline Committee resulting therefrom.

DATED at Toronto, Ontario, this 3rd day of October, 2012.

AOLS Mandatory Professional Development Program

By Paul Church, O.L.S., O.L.I.P.

It's alive!

After almost twelve years of work the AOLS Professional Development Program is in place.

On November 1, 2012, Regulation 327/12 was filed; this regulation makes a number of changes to Regulation 1026 under the Surveyors Act. Effective December 1, 2012, amendments to Regulation 1026 will implement a mandatory professional development program for AOLS members.

The program is defined by the Professional Development Program approved by the AOLS Council and Regulation 1026. The program requires that each member:

- accumulate 36 hours of Formal Activities in a three-year period;
 - accumulate 66 hours of Professional Activities in a three year period;
 - submit an annual report of his/her activities;
 - maintain records of his/her activities for five years; and
 - may be audited for compliance by the Registrar.
- The regulation authorizes the Registrar to allow exemptions from the program for members in certain situations.

The three-year period may be different for each member, depending on the date when membership was issued. The three-year period always starts on January 1 and ends December 31.

The program requires that any member who is not “actively engaged” in the practice of professional surveying complete, in the three-year period, an additional 30 hours of Formal or Professional Activities or a combination of both types of activities. To be “actively engaged” a member must spend 100 or more days per year in the practice of professional surveying.

Formal Activities include courses or seminars that relate to professional surveying, including the business aspects of professional surveying. Professional Activities include attending meetings, participating on committees, making presentations, preparing publications, and self-study.

In addition to the above requirements, Regulation 1026 s.26.1(1) states that the Registrar may suspend a member's licence or certificate of registration for failure to provide a professional development report or failure to comply with the requirements of the professional development program.

It all started...

... with a motion at the 2001 Annual General Meeting

which was moved by Bill Snell, seconded by Barry Clarke and passed by the membership in attendance: “Whereas continuing education is a vital component of maintaining professional competency, be it resolved that Council consider and examine the implementation of a mandatory continuing education programme.”

Council created a task force consisting of Cindy Kliaman and Paul Church to research other organizations and their professional development programs and prepare a report for Council. As part of their research, the task force reviewed a report prepared by the 1998 AOLS Continuing Education Task Force.

The 1998 Task Force was not mandated to review the mandatory component of continuing education, but the following excerpts from its report are still relevant:

In today's competitive and changing environment, it is increasingly important for AOLS members to engage in lifelong learning. The rate of technological change continues to accelerate, directly affecting the practice of Geomatics. In most practice areas, individuals who do not continuously improve their skills are soon out of date. It is no longer enough to establish competence at the beginning of a career. As reflected in government policies on the governance of professions, the public expects professionals and their support staff to continue demonstrating their competence.

Professional development consists of more than geomatics specific education and that nearly all education and training is of value. To maintain a level of professional competence, it is however, necessary to focus the continuing education program on the Members' core areas of activity.

The 1998 Task Force went so far as to create a schedule of activities and credits that form the basis of the program developed by the Professional Development Committee.

First there was the committee...

At the recommendation of the 2001 Task Force, Council created a Professional Development Committee (PDC) to develop a program and a regulation for presentation to the membership.

The PDC hired a professional educator, John Clipsham, PhD, to help the committee refine the program requirements. The program was built around a system of “categories and credits” with caps on the number of credits

that could be accumulated in each category. This system required that each member earn credits in three different categories in order to accumulate a specified minimum number of credits.

The philosophy of the PDC was that the program would require more than attending courses. Professional development included many other activities such as attending meetings with fellow professionals; participating in committee work; preparing presentations and publications related to the profession; and self-study and independent learning including reading magazines, books and on-line materials related to professional surveying and the business of surveying. This is not a new idea, the 1998 Task Force, and many other professional bodies recognized this philosophy.

The PDC recommended to Council at its meeting on July 10, 2004 that Mandatory Professional Development be phased in with the first three year period requiring mandatory reporting only and the final program requiring mandatory compliance with a specified number of credits. The PDC further recommended that the first phase be implemented by a by-law. During the phase-in period, a regulation would be developed and submitted to the Minister of Natural Resources to implement a mandatory program.

Then there was a by-law...

The PDC developed a by-law that required all members to report their activities and credits. The by-law was approved by the membership and became By-Law 2005-1. It required that the first report for 2005 be submitted by January 31, 2006 with a target of 85 credits per year.

By 2007, the PDC had reviewed the results of the reports and further tweaked the program. The committee also developed wording for a change to Regulation 1026 that would implement a mandatory professional development program. The original goal was to have wording in the regulation that would give “teeth” to the program, but would not specify many details about the program. It was hoped that the details of the program could be implemented by a by-law, making it possible to further adjust the program as needed.

But then a regulation...

By 2009 the PDC had developed a regulation and accompanying by-law for implementing the program. These documents were submitted to the Ministry of Natural Resources (MNR) for review in late 2010.

The end was in sight, therefore Council renamed the PDC as the Professional Development Task Force.

In early 2011, a response was received from legislative counsel. They requested significant changes. The Program had to be implemented by a regulation and could not be supplemented by a by-law. They also required that activities be measured by hours instead of credits.

This was a major challenge to the Task Force as it strove to maintain the philosophy used in developing the “cate-

gories and credits” system but without the multipliers and caps. There was a lot of discussion and re-development of the program during 2011 to incorporate this philosophy into a regulation. There was much dialogue between the Task Force, the Surveyor General (Susan MacGregor) and MNR’s Legislative Counsel. Finally, a regulation was crafted that satisfied both the Task Force and Legislative Counsel.

The regulation was approved by the membership in July 2012, and implemented by Regulation 327/12.

And now a program...

Regulation 1026 requires that Council establish a professional development program. This was done at the Council meeting on October 3, 2012. The details of the program are listed at the beginning of this article. The approved program includes the requirements in Regulation 1026 ss.41-43 as well as:

- requiring additional hours for members who are not “actively engaged”;
- approving for credit any course or activity that relates to or supports the practice of professional surveying;
- capping the number of hours that can be acquired from independent learning and self-study; and
- providing a “Definition of Activities” chart that further defines each activity and provides examples of activities that qualify.

Thanks to the many...

There were many people involved with the creation of the Professional Development Program. During the almost twelve years since the motion was passed at the 2001 AGM, the following people contributed many hours of effort to this cause:

Cindy Kliaman
Jaime Gelbloom
Peter Moreton
John Clipsham, PhD, consultant
Kent Campbell
Dave Horwood

The current Professional Development Task Force is composed of:

Paul Wyman
Dan Vollebekk
Duncan Ashworth
Paul Church
Russ Hogan, Council Liaison
Julia Savitch, AOLS Program Manager.



Paul Church, OLS is the Senior Surveyor in the Geomatics Section of the Ministry of Transportation in North Bay. Paul has been on the Professional Development Committee since its inception. He can be contacted at Paul.Church@Ontario.ca.

Attracting and Recruiting Survey Technicians through a College Connection

Contributed by Loyalist College

For Ontario Land Surveyors striving to keep pace with rapid changes in the industry, there is mounting pressure to attract and retain highly skilled workers. Among the most in-demand positions are land survey technicians, survey engineering technicians, draftspersons, and survey assistants.

Surveyors are always looking for candidates who can leverage the latest technology to help them gain a competitive advantage. However, finding the right people with the right experience and training for the job has become increasingly difficult.

The pool of land survey technologists and technicians has decreased, as the baby boomer population retires. Concerns about a looming labour shortage have many organizations scrambling to recruit new talent to help them expand and enhance their services, necessary for growth and prosperity.

One of the best sources of new talent for these roles is a community college, such as Loyalist College in Belleville, Ontario, which offers a two-year Survey Technician program. While it is the only Survey Technician diploma program in Ontario, survey technicians may graduate from a number of post-secondary programs, including Civil Engineering Technician/Technology and Construction Engineering Technician. Most of them go on to become Certified Technicians with the Ontario Association of Certified Engineering Technicians and Technologists (OACETT).

An excellent way for surveyors to meet tomorrow's professional, skilled workforce is by establishing a partnership with an Ontario college. As employers, surveyors



Loyalist College Civil Engineering Technician students Patrick Prusak and Mason Tolhoek, and Survey Technician student Philip Moss.

benefit from the practical skills students have learned in the classroom and through on-the-job-training, which can be completed in their organization. The work placement benefits both students and employers, who receive help in an office or field setting one day per week for a semester. While placements often transition into permanent employment, the opportunity allows a surveyor to try a person in a position, without having to make a long-term commitment to the student.

“We’ve had Loyalist Survey Technician students do placements here for decades,” said Robert Harris, a partner at Gifford Harris Surveying Ltd. in Trenton, Ontario. “It’s a win-win situation because the students help us out while they get hands-on experience. We have hired several Survey Technician graduates in the past, plus we have an employee who graduated from the Environmental Resources program at Loyalist who has worked here for many years.”

Through a combination of classroom instruction, practical field exercises and data processing with the latest

MicroSurvey CAD computer software, Survey Technician graduates gain the skills surveyors require. The program prepares them to work in a field or office environment by providing a strong foundation in basic surveying methods. They build on their broad knowledge with specific training in computer applications, data collectors and robotic total stations, AutoCAD drafting, specialized field and office skills, cadastral surveying skills, field astronomy, as well as Geographic Information Systems (GIS), and Global Positioning Systems (GPS).

“I was hired by Lloyd & Purcell Ltd. Ontario Land Surveyors three weeks after finishing the Survey Technician program,” said Scott Rowsell, a 2012 graduate of the program who now works as a survey field technician at

Lloyd and Purcell Land Surveyors in Newmarket. “Having access to the latest equipment allowed me to jump straight into the workforce and understand the equipment used by my employer. I knew what was expected of me and was able to apply what I learned in the program. Because the software that I used at Loyalist was modern, I had the skills necessary to work in the drafting area of surveying as well. Many of my classes were hands-on group projects in the field, so I graduated with experience as an instrument technician, as well as a note taker and party chief.”

For surveyors, having a college connection also creates access to invaluable resources ranging from expert faculty and industry research, to the most advanced equipment and software, on which students train.

“Loyalist’s Introduction to GIS/GPS course provides a practical introduction to the principles of GIS using projects and assignments produced in Esri ArcGIS,” said Loyalist Professor Bob Fencott. “The students learn the fundamentals of GPS data collection using a Sokkia GRX base station and rovers, and then use those skills for mapping and drawing projects.”

An ideal place to meet and recruit technicians is at college career fairs where surveyors can promote their business at a booth. More and more professionals from surveying, engineering, government, and transportation organizations are taking advantage of the opportunity to network with the next generation of workers. For employers interested in participating in Loyalist’s 16th Annual Career Fair on Thursday,



Loyalist College library.

February 7, 2013, the College accepts registrations until the end of January. Surveyors can also schedule College campus visits or classroom sessions to showcase opportunities with their organization.

“Companies often ask about our graduating students and we send them a list of individuals who have expressed interest,” said Bob. “All of our graduates are hired almost as soon as they graduate, because they have the skills needed in the industry. Employers can’t find enough Survey Technicians to fill the job demand.”

To attract the next generation of workers to the industry, Bob actively promotes the field and he encourages all surveyors to do the same. He believes it’s up to each member of the surveying community to build a positive awareness of the career opportunities available in the surveying field.

“Surveyors do a lot of research and investigation,” said Bob. “If a student likes to solve problems, they are likely going to do very well as a Survey Technician. They can choose to work in the field or the office. There is room for all of these people in the profession.”



For more information on the Loyalist Survey Technician program and partnership opportunities, please contact **Professor Bob Fencott** at (613) 969 – 1913 ext. 2419 or by email at bfencott@loyalistic.on.ca. You can also visit the Loyalist College website at www.loyalistcollege.com.



121st AOLS Annual General Meeting
February 26 to March 1, 2013
Toronto Marriott Downtown
Eaton Centre Hotel

121st AOLS Annual General Meeting
February 26 - March 1, 2013 – Toronto Marriott Downtown Eaton Centre

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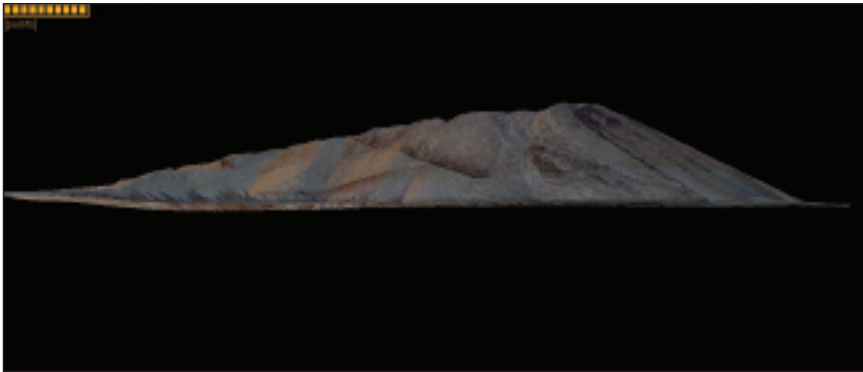


Industry News

Quantity Estimation Using LiDAR

By Rajive Sharma

Surveying stockpiles can be challenging and safety is a concern for all surveyors. The results for quantity estimation are required quickly and detailed reports containing elevations, contours, deviations, histograms, minimums, maximums and other types of mensuration are expected on site. The site engineers can quickly estimate reserves using 3D model data.



Surface model of the stock pile

Safety in the mining industry

The Canadian Institute of Mining, Metallurgy and Petroleum (CIM) is helping its members and their organizations foster a culture of safety in the Canadian mining industry. In the United States, mining establishments report to the United States Department of Labor's Mine Safety and Health Administration (MSHA) who in turn regulate safety mandates in the industry. The Canadian Society of Safety Engineering (CSSE) is one of the leading health, safety, and environmental organizations for professionals in Canada and also supports a Mining Practice Group (MPG) committee. MSHA mandates that a contractor has to ensure the safety of any personnel walking on the piles of material. Hence the use

of a LiDAR scanner fits well with the regulatory policy governing how stockpile volumes could be safely verified.

Many reasons to use LiDAR as a stockpile measuring tool

The terrestrial LiDAR system is gaining popularity in the mining industry due to its non-destructive, non-contact nature of measurement. A LiDAR pulse is emitted from the scanner at a sizable distance and 3D measurements are registered to the local co-ordinate system. Later the data is transformed into a global co-ordinate system as per the customer's requirements.

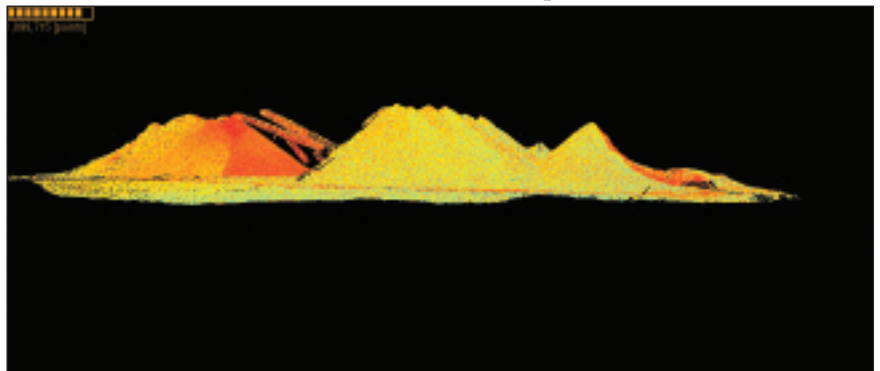
Compared to conventional measuring techniques where the surveyor has to walk over a loose pile of stock with a GPS, risking a collapse of the soft shoulder under his/her feet, LiDAR can be placed outside the area of busy traffic and can make measurements remotely without interrupting the flow of work.

With the help of Topcon's GLS-1500 laser scanner, a terrestrial LiDAR system, it is possible to achieve quick and accurate volumes of a quarry safely and efficiently. The high accuracy and long range measurement of this LiDAR makes it possible to gather the site data in a few hours and results can be computed on site. Finally a scaled drawing with the desired contour interval and an estimation of volume

and area can be delivered in a day.

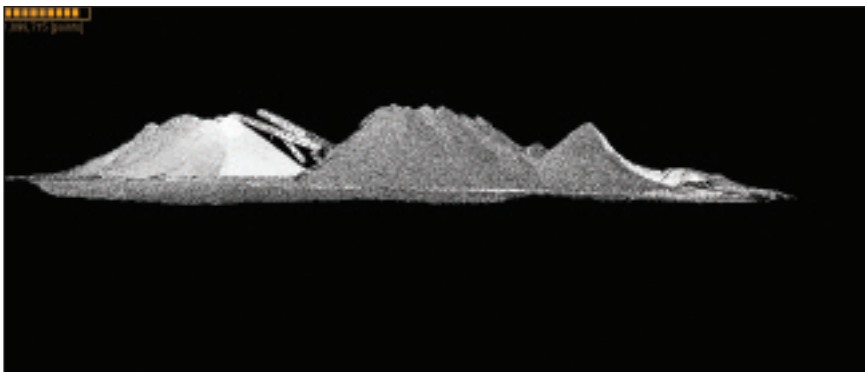
LiDAR use in the mining industry

The LiDAR scanner is not only a tool to safely calculate volumes; it also benefits multiple users and stakeholders.

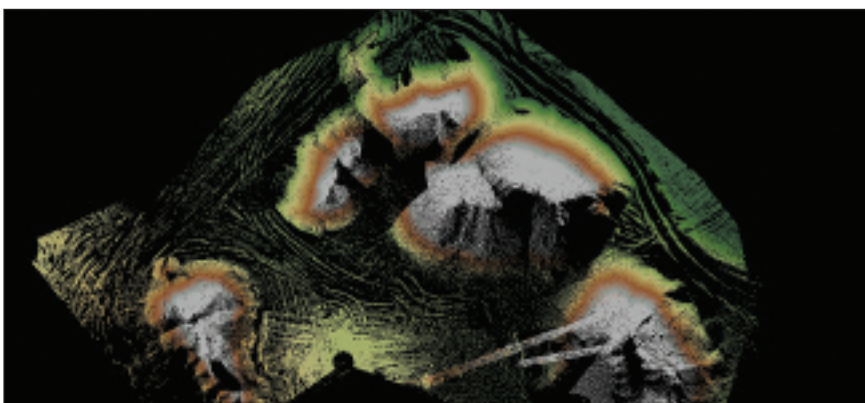


Classified point cloud





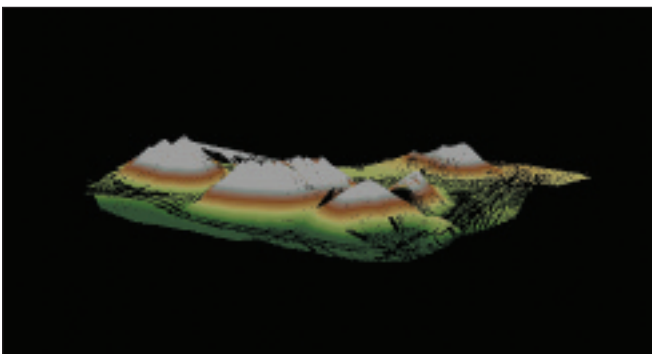
Intensity image of LiDAR cloud



Bird's eye view of the model

Here is a list of few other applications for this technology in the mining industry.

1. Stockpile Analysis
2. Volumetric Calculations
3. Slope adjustments
4. Highwall modeling
5. Spoilbank stability
6. Temporal Measurements
7. Change Detection
8. Regulatory Compliance
9. Loss Prevention
10. 3D Modeling
11. Resource Estimation



LiDAR point cloud colour coded for elevation

Methodologies

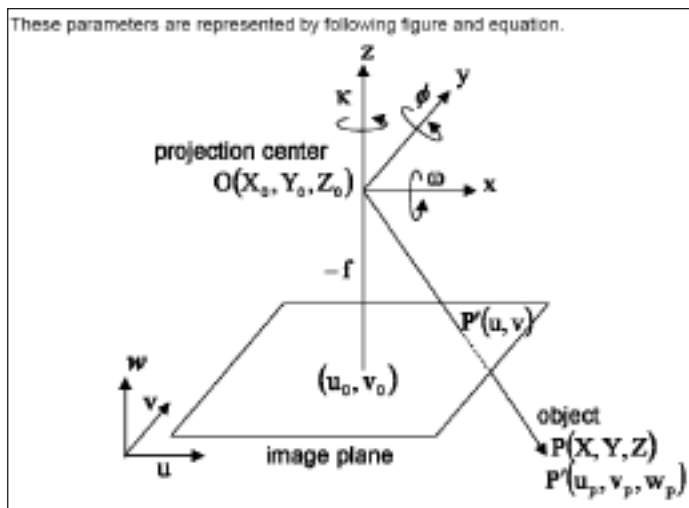
After the initial scanning of the area is completed, a wireframe model is generated and adjustments are made using triangulated gridded surfaces. With the scanned data it is easy to plot all features in and around the quarry using AutoCAD.

This surface information in some underground mines can be fused together with sub-surface models to visualize 3D drill hole information. This helps the geologists to do interactive 3D stratigraphic modeling for the purpose of design and estimation.

The 3D topographic information also helps the design engineers during their feasibility study to plan the mine based on the model data available. Various tools are used by the engineers to do their geostatistical analysis and by several methods such as Kriging, Independent Validation Dataset (IVD), simulation or multiple parameter techniques.

Image correlation to LiDAR points

The GLS-1500 takes colour images along with XYZ measurements during its scan. As a result the LiDAR data captured using the GLS-1500 has a Red, Green, Blue (RGB) colour attribute associated to each reading. The image orientation, focal length, XY of the principal point, distortion model, direction tangent, etc. are written to a file. Then these external orientation parameters and rotation angles with the projection of the image plane are then associated with each LiDAR range reading. The process is explained below.



Principal point (xp, yp)

It is the principal-point coordinates on image. Generally it is almost center of the image. The right side is defined as a positive direction of X, and the lower side is defined as a positive direction of Y

Pixel Size

It is a pixel size of the image. In the digital camera, it is an actual size of pixels on image sensor.

Lens Distortion Parameter K1,K2,P1,P2

K1 and K2 represent lens distortion parameter of radiation direction. P1 and P2 represent lens distortion parameter of tangential direction.

cont'd on page 42

EXT file

This file describes external orientation parameters (position: X_0, Y_0, Z_0 and rotation angles: ω, ϕ, κ) of an image.

PG_EXT_FILEVER1.D	FILE VERSION
-0.008735	X_0 [m]
-0.112345	Y_0 [m]
0.011910	Z_0 [m]
-75.783677	ω [deg]
-0.277030	ϕ [deg]
-41.927384	κ [deg]

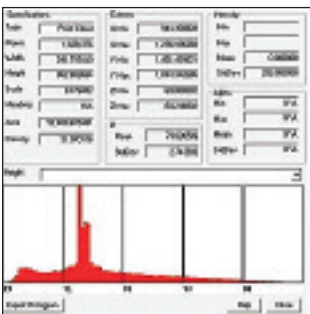
Here,
 Center of projection $O(X_0, Y_0, Z_0)$ ----- Ground coordinate system
 Position of object $P(X, Y, Z)$ ----- Ground coordinate system
 Position of object on film $P'(u, v)$ ----- Camera coordinate system
 Position of object $P''(u_p, v_p, w_p)$ ----- Camera coordinate system
 Focal Length f

Conversion between ground coordinates and camera coordinates:

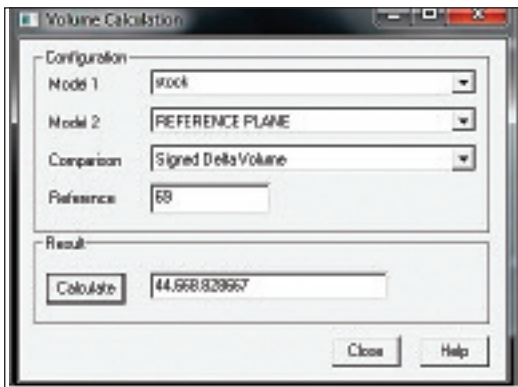
$$\begin{bmatrix} u_p \\ v_p \\ w_p \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 \\ 0 & \cos \phi & -\sin \phi \\ 0 & \sin \phi & \cos \phi \end{bmatrix} \begin{bmatrix} \cos \phi & 0 & \sin \phi \\ \sin \phi & \cos \phi & 0 \\ -\sin \phi & 0 & \cos \phi \end{bmatrix} \begin{bmatrix} X - X_0 \\ Y - Y_0 \\ Z - Z_0 \end{bmatrix}$$

$$X = \frac{-f}{w_p} u_p \quad Y = \frac{-f}{w_p} v_p$$

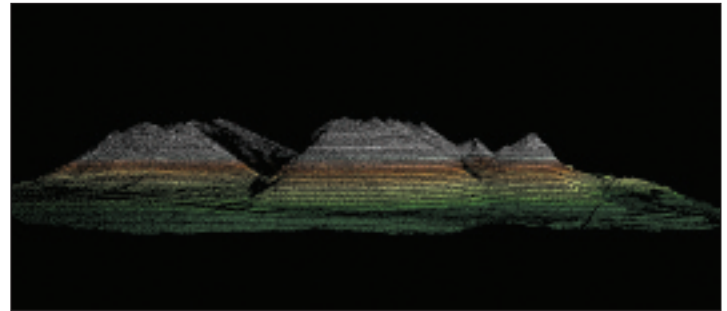
Mensuration



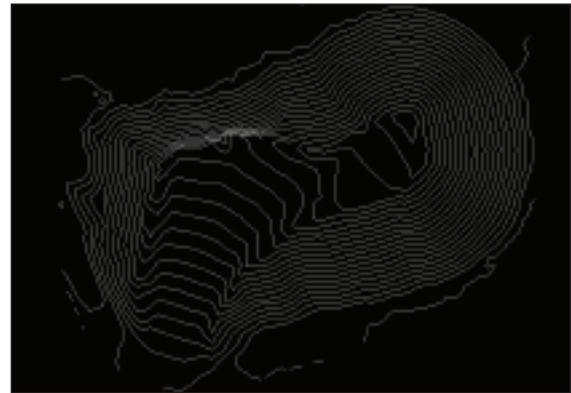
Stockpile Volume



Contours




Contours at 0.5m interval



DWG file with contours of the stock pile

Conclusion

The mining industry can benefit greatly by using a LiDAR scanner and its 3D modeling data rather than conventional surveying methods for the measurement and calculation of stockpiles. This technology brings safety, accuracy, speed and efficiency to the work site and is a cost effective way to produce the various quantity estimations that are required by all stakeholders in the quarry. For more information on the Topcon GLS-1500 laser scanner, visit  www.sokkiacanada.com.

Rajive Sharma, B.Eng., MCPM is the Manager- Imaging & Monitoring at Sokkia Corporation in Mississauga, Ontario. He can be reached by email at rsharma@topconsokkia.com for further information.

Sites to See

Joint EOGC'2013 and CIG Annual Conference

<http://eogc2013.blog.ryerson.ca/>

The International Conference on Earth Observation for Global Changes (EOGC) conference series has been a bi-annual event since 2006, endorsed by the International Society for Photogrammetry and Remote Sensing (ISPRS), the International Cartographic Association (ICA), the International Association of Geodesy (IAG), and the International Society for Digital Earth (ISDE). EOGC'2013 Conference will be held on 5-7 June 2013, in Toronto, Ontario, Canada, co-organized by the CIG Toronto Branch, Ryerson University, University of Waterloo and York University. Details about workshops and abstract/paper submission will be available on the website.

Members in the News

Jonathan Li, O.L.S., O.L.I.P. has had a new book published.

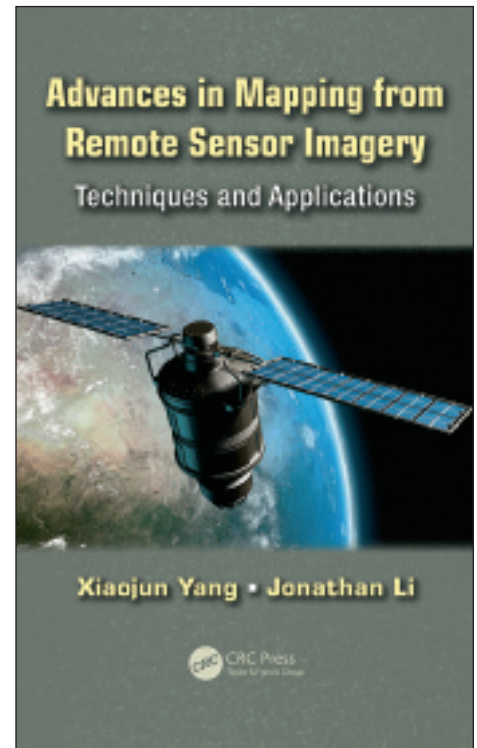
Advances in Mapping from Remote Sensor Imagery: Techniques and Applications

By Xiaojun Yang, Florida State University, Tallahassee, USA and Jonathan Li, Waterloo University, Ontario, Canada. Published by CRC Press, Taylor & Francis Group

This book reviews some of the latest developments in remote sensing and information extraction techniques applicable to topographic and thematic mapping. Providing an interdisciplinary perspective, leading experts from around the world have contributed chapters examining state-of-the-art techniques as well as widely used methods.

It covers a broad range of topics including photogrammetric mapping and LiDAR remote sensing for generating high quality topographic products, global digital elevation models, current methods for shoreline mapping, and the identification and classification of residential buildings. Contributors also showcase cutting-edge developments for environmental and ecological mapping, including assessment of urbanization patterns, mapping vegetation cover, monitoring invasive species, and mapping marine oil spills—crucial for monitoring this significant environmental hazard.

More information on this book can be found at:
<http://www.crcpress.com/product/isbn/9781439874585>



Lunch with Honorary AOLS Member Dr. Gordon Gracie and Robert Gunn, OLS (Ret)



From left to right: Doug Aron, Gordon Gracie, Maureen Mountjoy, Bob Gunn and Blain Martin

Dr. Gordon Gracie and Bob Gunn OLS (Ret) are both retired professors from the Erindale College Survey Science Program. The conversation revolved around the program and a document that Bob has prepared about the history of Survey Education at the University of Toronto. It was great seeing Gordon and Bob and spending some time with them reflecting on our days at Erindale.

Blain Martin, OLS, CLS, PMP, MBA
Executive Director

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EDUCATIONAL FOUNDATION NEWS

Congratulations to the Fall 2012 Educational Foundation Award Winners

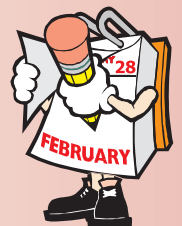
On November 8, Registrar Bill Buck and Deputy Registrar Maureen Mountjoy attended the Department of Civil Engineering 2012 Awards Evening at Ryerson University. They presented awards to the following students: **Maaz Malek** and **Farshad Dalaki** who are students entering the fourth year of the Geomatics Engineering option who have demonstrated academic excellence in third-year engineering courses and are contributing to social activities at the university or the broader community; **Armin Akhlaghi** and **Umaru Marks Karqbo** who are students entering fourth year of the Geomatics Engineering option whose fourth-year project involves survey law, cadastral studies, land tenure or land and geographic information systems;

and **Mayqaq Abdulkarim** and **Lauren Dawe** who are students entering fourth year of the Geomatics Engineering option whose fourth-year project includes aspects of surveying, GPS, digital mapping, geospatial information systems or remote sensing.

On November 13, the Eastern Regional Group Award was presented to **Stephen DeCaro**, who is a student in the 2nd year of the Survey Technician Program at Loyalist College.

Mark your calendars

The Educational Foundation Annual Meeting of Members will be held on Thursday, February 28, 2013 at the Toronto Marriott Downtown Eaton Centre Hotel in Toronto, Ontario from 7:30 a.m. to 8:30 a.m.



The Educational Foundation would like to recognize with thanks donations made in the memory of Doug McNeely, Doug Magee and Jim Campbell.

BOOK REVIEWS

Land and Book

Literature and Land Tenure in Anglo-Saxon England

By Scott T. Smith



Published by University of Toronto Press
ISBN 978-1-4426-4486-1

In this original and innovative study, Scott T. Smith traces the intersections between land tenure and literature in Anglo-Saxon England. Smith aptly demonstrates that as land became property through the operations of writing, it came to assume a complex range of conceptual values that Anglo-Saxons could use to engage a number of vital cultural concerns beyond just the legal and practical – such as political dominion, salvation, sanctity, status, and social and spiritual obligations.

Land and Book places a variety of texts – including charters, dispute records, heroic poetry, homilies, and the Anglo-Saxon chronicle – in a dynamic conversation with the procedures and documents of land tenure, showing how its social practice led to innovation across written genres in both Latin and Old English. Through this, Smith provides an interdisciplinary synthesis of literary, legal, and historical interests.

Information taken from the publisher.

Mapping, Measurement and Metropolis

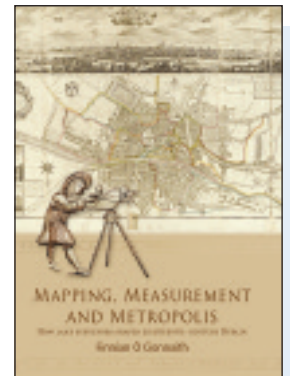
How land surveyors shaped eighteenth-century Dublin

By Finnian Ó Cionnaith

This book charts the exceptional impact that a small group of land surveyors had on the development of Dublin city during the eighteenth century. Written with unique technical insight, this book examines an industry that was simultaneously a mixture of art, science and business and left the city with a diverse and vibrant cartographic heritage. Its practitioners ranged from professionals and artists to frauds and rogues.

Dublin's surveyors dealt with the city's richest lords and its poorest tenants, providing the images onto which some of the most interesting and important stories of eighteenth-century Dublin are told. Despite their relatively small numbers, they played a unique and fundamental role in shaping Dublin into what it is today.

Information taken from the publisher.



Published by Four Courts Press
ISBN 978-1-84682-348-0



Published by Alpha, a member of
Penguin Group (USA) Inc.
ISBN 978-1-61564-194-9

The Complete Idiot's Guide to Geocaching, Third Edition

By The Editors and Staff of Geocaching.com

There's nothing quite like geocaching. What other activity utilizes GPS satellites orbiting thousands of miles above the earth to find hidden treasure? And with new technological advances and other exciting developments, geocaching is more appealing than ever.

Whether you are new to geocaching or a seasoned veteran, we trust you'll find that we've covered the topics necessary to keep you geocaching successfully and safely every time

you hit the trail. This is no easy endeavor. Although this is the third version of the original, the activity has changed significantly throughout the years and even changes from one week to the next.

Completely revised and updated with the latest changes to the game, this helpful guide gives you a sure path from start to geocaching success.

Information taken from the publisher.

The Last Word

25 Years of the Expanded Profession

In the early 1980s, a decision was made to revise the *Surveyors Act* to allow restructuring of the association and provide a home for geodesists, hydrographers and photogrammetrists. The proclamation of a new *Surveyors Act* in 1988 restructured the Association of Ontario Land Surveyors and provided for an expanded profession of land surveying. The Registrar was able to issue a Certificate of Registration in respect of professional land surveying in the branches of photogrammetry, geodesy and hydrography to someone who met the qualifications prescribed in Regulation 1025, Revised Regulations of Ontario (R.R.O.) 1990. This regulation was revoked in 1993. Section 16 of the *Surveyors Act*, Revised Statutes of Ontario (RSO) governed the issuance of a Certificate of Registration to the three branches.

On December 27, 1999, Section 23 of Regulation 509/99 of the *Surveyors Act* was set in place to create a two-year window of opportunity

for the experienced Geographic Information Manager to join the AOLS through a “Grandfathering” provision. That window closed on December 27, 2001. Regulation 509/99 was required to accommodate Geographic Information Management as a branch of professional land surveying. Geographic Information Managers who met the requirements of the AOLS were issued a Certificate of Registration. Section 22.1 of Regulation 1026 prescribed Geographic Information Management as a branch of professional land surveying.

Section 22.1 of Regulation 1026 (revised this year) under the *Surveyors Act* prescribes Cadastral surveying, Geodetic surveying, Hydrographic surveying, Photogrammetric surveying and Geographic Information Management all as branches of professional surveying.

The Five Branches of Professional Surveying

- Legal Boundary:** Legal boundary surveyors provide an expert opinion on the location of boundaries using historical research, a knowledge of statute and common law, and the latest technology in measurement and data processing.
- Geographic Information Management:** Geographic information managers oversee the development, implementation, and operation of a geographic information system with computers, GPS units, surveying instruments and mapping software.
- Geodetic:** Geodetic surveyors measure and monitor the Earth and its geodetic field, polar motion, tides, and the movement of its crust in three-dimensional space.
- Photogrammetry:** Photogrammetric surveyors create accurate scale models where distances and heights can be measured and mapped from ground stations, aircraft and satellites.
- Hydrographic:** Hydrographic surveyors measure and chart the physical features of rivers, lakes and oceans. They install survey platforms such as boats, barges and aircraft.

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Advertising Rates:

	1 time	4 times
1st Cover	Not Sold	Not Sold
2nd and 3rd Cover	Not Sold	\$650
4th Cover	Not Sold	\$750
Full page 4 Colour	\$640	\$600
1 page B&W	\$440	\$400
1/2 page B&W	\$255	\$225
1/4 page B&W	\$175	\$150

Colour ads: Add \$50 for each colour up to 4 colours
Inserts (supplied): Page rate plus 25%.
(overleaf blank): plus 50%

Mechanical Requirements:

Printed Offset
Typed Page: 48 picas wide x 63 picas deep
Bleed Size: 8-3/4" wide x 11-1/4" deep
D.P.S.: 17" wide x 11" deep with bleed
D.P.S.: 16" wide x 10" deep without bleed

Material Requirements:

Four colour: Colour separations supplied, type assembly and progressive proofs with colour bars.
Black, black and one or two colours: Either film or art supplied with layout and copy; or complete assembly.

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