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XVI FIG Congress 2018
6-11 May 2018
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**EMBRACING OUR SMART WORLD WHERE THE CONTINENTS CONNECT:
ENHANCING THE GEOSPATIAL MATURITY OF SOCIETIES**

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EMBRACING OUR SMART WORLD WHERE THE CONTINENTS CONNECT:

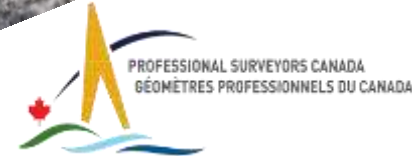
ENHANCING THE GEOSPATIAL MATURITY OF SOCIETIES

The 3D Cadastre for underground infrastructure: A challenged approach from Professional Surveyors Canada...



Gabriel Arancibia , Wilson Philips and Al Janes -Canada

Professional Surveyors Canada - Géomètres Professionnels Canada



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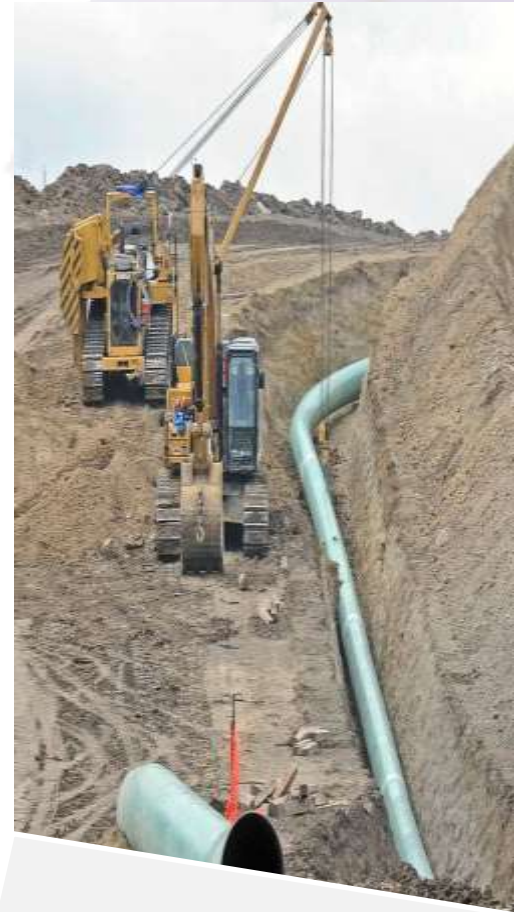


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AGENDA

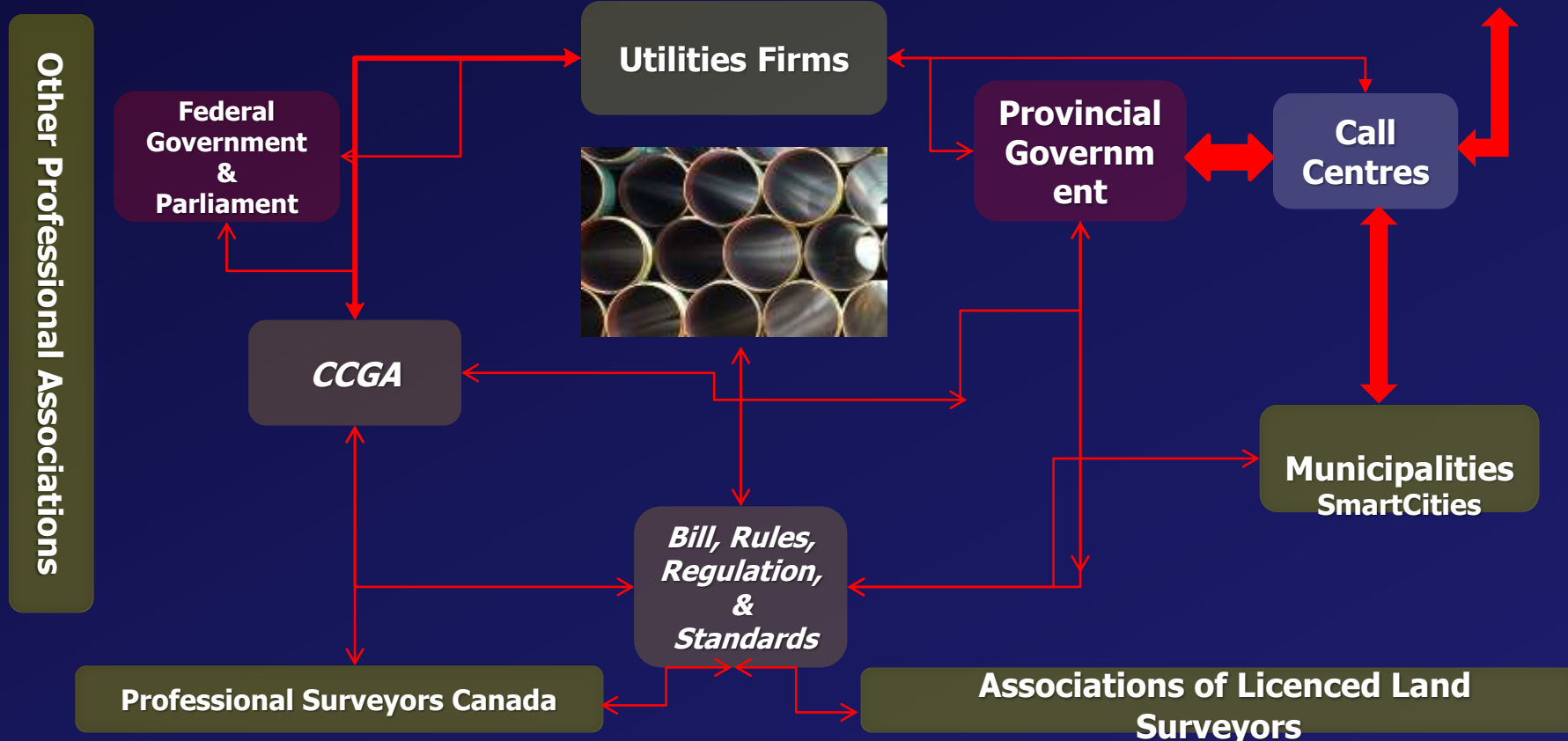
- **Information Management systems for Underground Utilities in Canada.**
- **Professional Surveyors Canada position about this issue - Why should we care?**
- **The step forward for the PSC approach – What is the real issue?**
- **Building a comprehensive approach**
- **Current results and next steps.**



The stakeholders in the Underground Infrastructure

sector...

Public, Contractors and interest groups



Underground Utilities in Canada: Current situation of the Information Systems

Infrastructure are often **not surveyed/mapped accurately** and **not link to cadastral maps.**

- The as-built **information is not complete** (not located evidence of oil/gas line underground).
- **No standard** for locating and no guarantee of **liability insurance.**
- The equipment maps within **one meter horizontally and worse vertically.**
- Underground utilities **is located over and over again** (Call Centers).
- **No common system is up-to-date** (no integration of multiple IMS).
- **Legislation** for underground utilities is dramatically different for surface infrastructure (i.e. Cadastre/land registry)

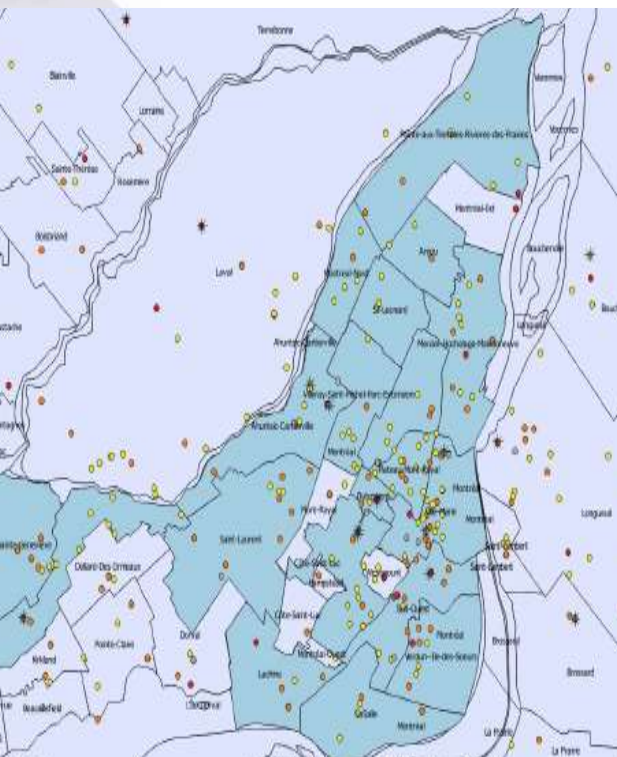


Underground Utilities in Canada: Current situation of the Information Systems



- **Registry systems for utilities** at provincial level doesn't have a link with **geospatial maps** (e.i. Cadastre).
- **Land registration of property rights is mandatory**, but utilities registration is very limited and with no geometric/geospatial information included.
- **Private One-call system** is a prevention solution in urban agglomerations with already crowded underground infrastructure.
- **Most of the legislation is focus in prevention** for potential accidents, but a lack of focus in standards.

Professional Surveyors Canada (PSC-GPC) position about this issue: Why should we care?



- Safety of the public and workers.
- Minimize the cost of accidents.
- Fundamental rights of private land owners.
- Avoid time delay and costly operation before digging.
- Eliminate hazards.
- Public awareness.
- Legislation does not cover land ownership issues.
- Current legislation is reactive and not proactive.
- Advocate for comprehensive standards.
- Surveyors points of view matters [FIG Working Group on 3D Cadastre].

Professional Surveyors Canada (PSC-GPC) position about this issue: Why should we care?

DOMESTIC NEWS MAY 2, 2017 / 2:13 PM / 6 MONTHS AGO

Gas leak forces shutdown of central Ottawa, including PM's office

3 MIN READ

OTTAWA (Reuters) - Police in Canadian capital Ottawa on Tuesday temporarily shut down four city center blocks, including a building where the prime minister works, after a mechanical digger ruptured a natural gas pipeline.

Emergency personnel and workers are pictured at the scene of a gas leak in downtown Ottawa, Canada, May 2, 2017. REUTERS/Chris Wedel

City authorities said in a tweet at 6 pm eastern (2200 GMT) that the area had been reopened. The leak started at around 1:30 p.m. eastern.

The evacuated buildings included the Langevin Block on Wellington Street.

40 cm séparent l'UPA et Pike River du gazoduc TransCanada

23 avril 2017 - alexandre shiells | actualités sur TransCanada

TransCanada refuse profondément, de la producteurs agricoles les États-Unis. Deva renvoyer de l'environ

La pétrolière alerte le territoire québécois une conduite supplé Québec. C'est-il vrai

The pipeline is an opportunity to renew First Nation jurisdiction

1. About 100 First Nations are in the pipeline's path, and in the 1980s and 1990s, many of them signed treaties with the federal government.

2. The pipeline is a chance to renew First Nation jurisdiction over their lands, and to give them a say in the pipeline's route.

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Le projet de la controverse

En dossier d'Alexandre Shiells

Le projet de la controverse En dossier d'Alexandre Shiells

The step forward for the PSC approach – What is the real issue?



This lack of survey and geospatial data:

- Creates loss of use situations to critical infrastructure (power, telecommmunications, etc.);
- Generates hazards for workers;
- Increase inefficiencies in locates for customers;
- Reduces efficies and productivity of One Call systems;
- Increment cost for each new installation of underground infrastructure;
- Greatly increases the amount of redundant locates being done;
- Increase risk to the public and the environment.

Building a comprehensive approach



- **Survey and Map All** by licenced professional surveyors during installation;
- **Define standards for registering survey data** to provide interchange and interoperability between systems;
- **Registered Plans of Easement** – Private Lands;
- **Alignment Survey** by licenced land surveyors;
- **Burial Depth or Depth Cover** – Federal Legislation is not explicit (different standards);
- **Buffer Distance** – safety distance;
- **Registration time limits** – Only in the oil extraction industry until now.
- **Standarize legislation** between federal, provincial and local government.

Current results and next steps...

- **Provincial government should build and maintain a mandatory 3D Cadastre for all urban areas.**
- **PSC standards and data model for registry survey data** along with multidisciplinary group of professional (OGC, CCGA, etc.).
- **Building a 3D Cadastre** (mapping solution for underground infrastructure) is a logical step and the technical challenges are achievable.
- **PSC is working to introduce survey and geospatial amendments to the federal legislation.** Next step is to support our sister associations (or other related professional associations) to provide advice in provincial legislation.
- **Pilot projects** will be done in coordination with Canadian Universities.
- **Coordination with local government** is essential to review issues and promote innovation (SmartCities initiatives).



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Questions? Clarifications? Comments?



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