

Presented at the FIG Working Week 2016,
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SUBSURFACE UTILITY NETWORK REGISTRATION AND THE PUBLICATION OF REAL RIGHTS: Towards Full 3D Cadastre

Dr. Jacynthe Pouliot,
Professor and land surveyor
Department of Geomatics Sciences, Université Laval, Canada
(jacynthe.pouliot@scg.ulaval.ca)

Dr. Philippe Girard
Student, U.Laval, future land-surveyor



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Recovery
from disaster

An **interactive** presentation

in 4 questions (YES or NO)

For YOU !



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Question 1

- At home, do you know where underground utility networks are located?
- Is it needed?
- We argue YES
 - Many reasons....
 - Let's talk regarding the registration and publication of real rights



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Question 2

- In your Country, are underground networks registered?
 - Object itself or RRR (Rights, Respons., Restrictions)
- Is it needed?
- We argue YES
 - all operations (building, sales, mortgaging, subdivision, etc)
 - To know the existence of underground networks!
 - To support the establishment and publication of RRR
 - To protect owner's right
 - To secure real estate transaction



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Jurisprudence (Quebec Civil code)

- Context: registration not mandatory

Summary (June 2015)

Bill S-233 Consultation

7 August 2015

Dear Underground Infrastructure Safety Advocate,

In the spring of 2015, Senator Grant Mitchell introduced Bill S-233, *An Act Enacting the Underground Infrastructure Safety Enhancement Act and Making Consequential Amendments to Other Acts*. **The legislation would require that federally-regulated infrastructure be registered with a provincial notification centre**, where one exists. For provinces without notification centres, the legislation would allow the federal government to encourage the creation of notification centres through funding grants.

- Estimated direct and indirect costs of CDN 95\$ millions

* Stats extracted from infoExcavation



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Question 3

- If underground networks are registered in your Country, is it integrated in the current cadastre system?
- Is it needed?
- We argue NOT necessary...
 - YES, Would be easier for registration process
 - BUT regarding mapping process...
 - 3D space, Very long geometry, not continues space, not or rarely visible
 - If not integrated, we need a linkage between cadastre and, at least, the path of the network



Question 4

- If underground networks are registered in your Country, what kind of features would be valuable?
 1. Standards for the geometric and semantic description
network itself / data acquisition and dissemination
 2. Designation of impacted land
at least a list of land parcels affected
 3. Easements published in the land register



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Question 4

If underground networks are registered, what kind of features would be valuable?

4. Map of underground networks

OR: at least 2D cadastre maps with the projection of the footprint of the underground networks

5. Tools that support multiple spatial analysis to determine the relationship with overlapping land parcels or other legal objects



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CONCLUSION



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A case study – Quebec jurisdiction

- Underground network
 - State resources and private distribution networks
 - Optionally stored in a Register complementary to the Land Register (called FITNO)
 - One land file
 - A serial number
 - The name of the holder (ownership of the property)
 - The name of regional administration
 - A link to official Real estate transactions (dead, mortgage, easement, sale, etc)



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Example of Real estate transaction

Registre des réseaux des services publics et des immeubles situés en territoire non cadastré

Circonscription foncière :	Québec	Dates de mise à jour du Registre
Numéro d'ordre :	20-B-6061	Droits :
Lieu :	Réseau : Télécommunication par câble	2015-01-30 14:12
Date d'établissement :	2004-05-21 14:59	Radiations :
Concordance :		2015-01-19 12:00

Date de présentation	Numéro d'inscription	Nature de l'acte	Qualité	Nom des parties	Remarques	Avis d'adresse	Radiations
2004-05-21	11 339 702	Ouverture	Titulaire	TELUS COMMUNICATIONS (QUÉBEC) INC.	72396		
2004-05-21	11 339 702	Hypothèque Universalité d'immeubles	Créancier Débiteur	TRUST GÉNÉRAL DU CANADA TELUS COMMUNICATIONS (QUÉBEC) INC.	275 000 000,00 \$		I 17 386 613
2004-06-22	11 451 866	Cession de créance hypothécaire	Requérant	Trust Banque Nationale Inc.	Réf. : 11 339 702	6 003 022	I 17 386 613
2004-06-30	11 489 222	Cession d'un immeuble	Cédant Cessionnaire	TELUS COMMUNICATIONS (QUÉBEC) INC. TELUS COMMUNICATIONS INC.			I 17 386 613
2006-04-28	13 234 960	Cession d'un immeuble	Cédant Cessionnaire	TELUS COMMUNICATIONS INC. TELUS COMMUNICATIONS COMPANY/SOCIÉTÉ TELUS COMMUNICATIONS			I 17 386 613
2009-02-13	15 954 312	Cession de créance hypothécaire	Cédant Cessionnaire	NATIONAL BANK TRUST INC. / TRUST BANQUE NATIONALE INC. COMPUTERSHARE TRUST COMPANY OF CANADA / SOCIÉTÉ DE FIDUCIE COMPUTERSHARE DU CANADA	Réf. : 11 339 702	6 014 036	I 17 386 613
2011-07-22	18 342 338	Servitude	Cédant Cessionnaire	Sa Majesté La Reine du Chef du Canada Cogeco câble Canada Inc. Hydro-Québec et autres			
2014-05-05	20 716 139	Servitude	Cédant Cessionnaire	SA MAJESTÉ LA REINE DU CHEF DU CANADA par le ministre de la Défense nationale COGECO CABLE HOLDINGS INC. HYDRO-QUÉBEC et autres			

Example of Real estate transaction

Numéro inscription : 20 154 184 DHM de présentation : 2013-07-29 11:17

Numéro inscription : 20 154 184 DHM de présentation : 2013-07-29 11:17

- 54 -

ON THIS TW
THIRTEEN ()
BEFORE Mtr

REGIST
Divi
Champlain
Charlevoix 1
Charlevoix 2
Châteauguay
Chicoutimi

Paroisse de Saint-Ignace-du-Coteau-du-Lac
Paroisse de Saint-Joseph-des-Cèdres
Paroisse de Saint-Lazare
Village de Saint-Michel-de-Vaudreuil
Paroisse de Saint-Michel-de-Vaudreuil
Paroisse de Saint-Polycarpe
Paroisse de Saint-Télesphore
Paroisse de Saint-Zotique
Village de Soulanges

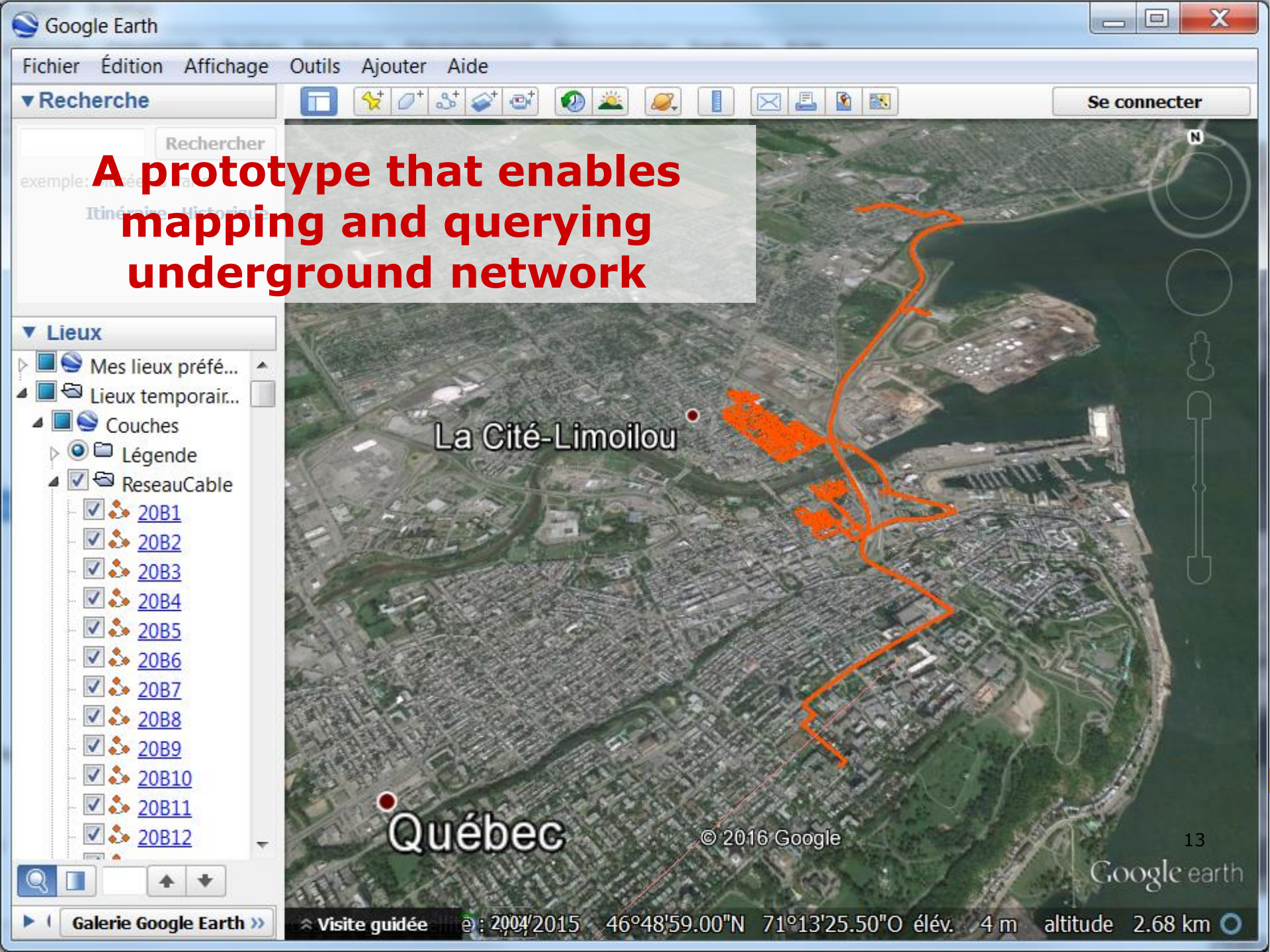
Specific issues

- No guideline for the description of the network (neither semantic or geometric)
- Land file opens only when real estate transaction occurs
- No cadastral map available
- Not able to know which land parcels is crossing

Argen
Arthal
Beauc
Beaul
Bellec
Berthi
Bonav
Bonav
Brom
Cham

Nicolet (Nicolet
Papineau
Pontiac
Portneuf
Québec
Richelieu
Richmond
Rimouski
Rouville

ONE BILLION FIVE HUNDRED AND EIGHTY-SEVEN MILLION DOLLARS (\$1,587,000,000) plus an additional amount equal to twenty percent (20%) thereof to secure all costs, accessories and incidental expenses, the whole with interest at the rate of TWENTY-FIVE PERCENT (25%) per annum, calculated daily and compound monthly, with interest on overdue interest calculated at the same rate and in the same manner.



A prototype that enables mapping and querying underground network

La Cité-Limoilou

Québec

© 2016 Google

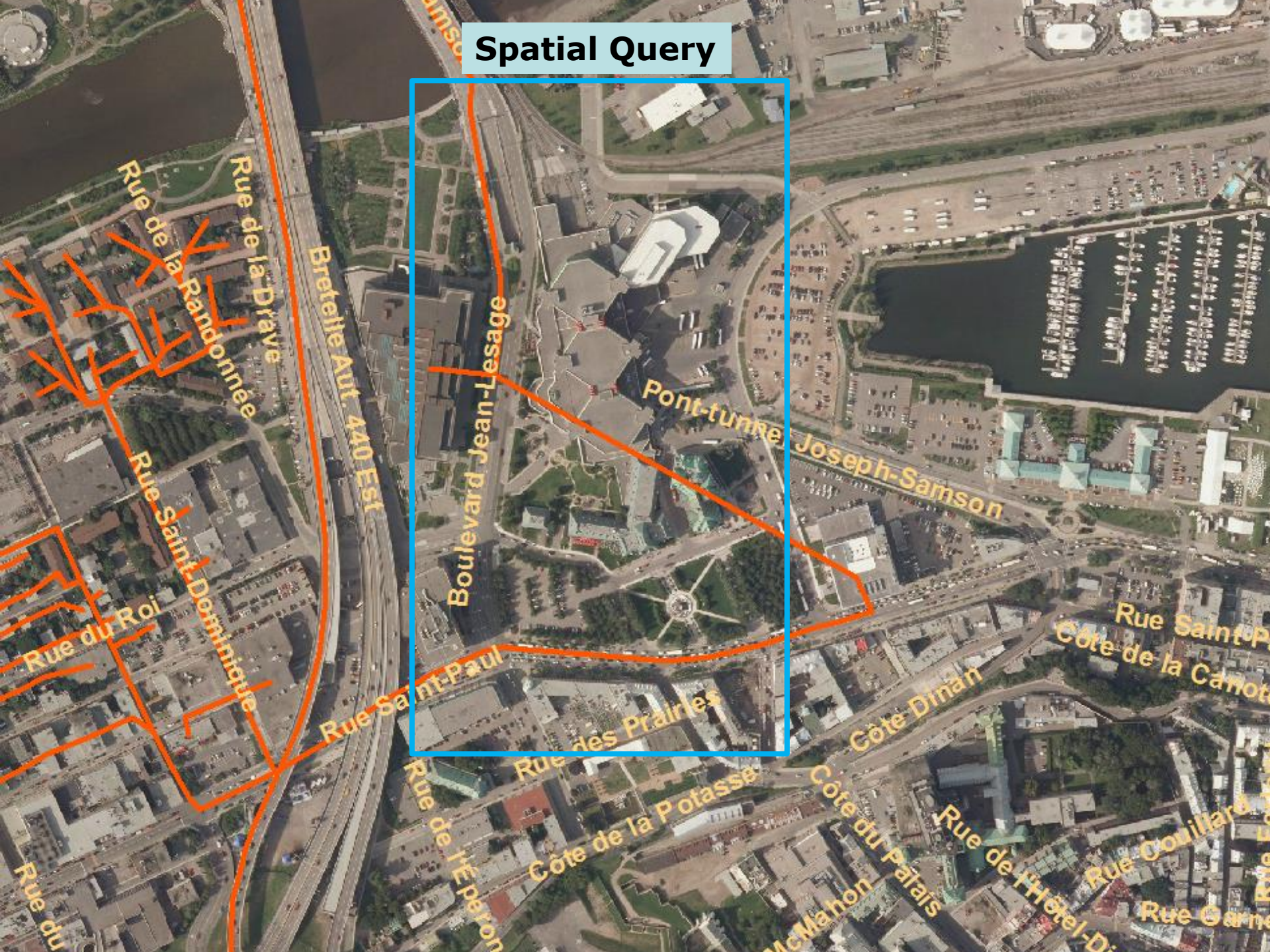
13

Google earth

Galerie Google Earth >>

Visite guidée @ : 2004/2015 46°48'59.00"N 71°13'25.50"O élév. 4 m altitude 2.68 km

Spatial Query



Which cadastre units are overlapping the underground object?

■ Result

NO_LOT

1479142

1479179

1479048

1314972

PC-02159

1314862

1314868

1314837

3413138

1314869

1213133

1213455

1213134

1213452

2646771

1314867

1570657

1570714

1570661



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Future works

- A 5 years new Discovery Grant
 - Visualization and analysis of legal objects that are underground “not visible” and vertically superimposed.
 - Deployment of 2D and 3D modelling principles
- Looking for graduate students and internships
- Contact me: Jacynthe.pouliot@scg.ulaval.ca



OPEN PH.D. or M.Sc. POSITION IN 3D MODELING OF UNDERGROUND LEGAL OBJECTS

Department of geomatics sciences,
Université Laval, Quebec, CANADA

June 2015

PROPOSAL OF A NEW CHART FOR THE APPEARANCE OF 3D MODELS OF UNDERGROUND OBJECTS THAT SUPPORT REAL ESTATE ADMINISTRATION

PROJECT DESCRIPTION

We are seeking a Ph.D. Student or M.Sc. Student who will work with the industry and the government to design a new generation of 3D models better adapted to support legislative decision-making process involving underground and vertically overlapping objects (like communication and distribution networks). Legislative decision-making process refers to ownership or easement establishment and management when real estate transaction occurs. The main outcome will be a graphical chart for the appearance of 3D

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