

**CIRANO note based on a report carried out under the direction of
Nathalie de Marcellis-Warin and Ingrid Peignier, November 2015**

Vast networks of conduits and cables lie underground, delivering products and services to today's society. The increasing number of networks, along with the fact that they are buried not far from the ground's surface translate into contractors striking them frequently while doing excavation or rehabilitation work of all kinds.

With damages prevention as a goal and best practices as an incentive, the authors identify and quantify the total costs of damages done to underground infrastructure in the province of Quebec, with special attention to indirect costs, which are difficult to quantify and rarely taken into account when making decisions related to excavation work or prevention. They established the following specific objectives:

1. Develop a typology for damage related direct and indirect costs for underground infrastructures.
2. Quantify total related costs for four types of damages to underground infrastructures in the province of Quebec.
3. Develop an assessment methodology for damage related indirect costs for the province of Quebec and assess the total indirect costs for 2014.

Indirect costs reflect the economic assessment of all disruptions related to damages done to underground facilities. They are varied and cover a wide range of areas. They can represent a service disruption, cause traffic disturbances, mobilize emergency services, and have environmental impacts as well as economic ones (loss of revenue, reputation, etc.). In most cases, these additional costs are incurred by society. The authors have estimated that in 2014, damages to underground infrastructures in Quebec amounted to at least 125 million dollars annually in total indirect costs.

Given the findings and results of their research, the authors make the following recommendations depending on the actors that intervene when an infrastructure is damaged.

Excavation companies should follow damage prevention training sessions and follow best excavation practices. Locate requests made to Info-Excavation should become mandatory throughout the province of Quebec.

Registering and declaring the location of their network to Info-Excavation should be made mandatory to all **owners of underground infrastructures**. They should improve the precision of their data pertaining to the location of their underground network and continue their efforts in identify existing networks.

Making a locate request to Info-Excavation should be mandatory before writing an excavation tender. Initial estimates must be as precise as possible, plans and technical specifications should be more detailed in terms of excavation constraints for **bidding companies**.

In planning and maintaining their underground infrastructures, **municipalities** could use the study's results and integrate them in their decision-making process.

The authors are currently working on developing an online tool to assess very quickly the indirect costs of damages done to underground infrastructure using damages databases from each of the Canadian provinces.

The full study is available on CIRANO's Website.

French version:

<http://cirano.qc.ca/files/publications/2015RP-14.pdf>

English version:

<http://cirano.qc.ca/files/publications/2015RP-15.pdf>