

INJURIOUS AFFECTION and HVTL corridors:

a study of quantification of value loss related to expropriation

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Introduction

In 2007, Altus Group undertook a study of injurious affection (loss in value to the remainder of property after takings by expropriation) related to the Bruce to Milton 500-kV transmission line reinforcement in Ontario. That study concluded that there was only nominal property value loss to properties. In 2011, Altus again undertook a study to confirm, revise, or deny the original hypothesis of injurious affection. A team of four appraisers and two staff analysts was involved in the wide-ranging study, which involved more than 70 properties on four electricity transmission corridors

in Ontario. The results of this study were tested in a series of arbitration hearings in 2013 with considerable success.

Negative or positive? A review of the literature and case law

The potential for negative impact on property value by high voltage transmission lines (HVTL) has been debated by real estate appraisers, environmental engineers and lawyers, and is frequently the subject of legal action before the courts and judicial tribunals. Concurrent to our analysis of actual properties, we conducted a review of the literature, specifically on the terms

‘paired sales analysis’ and ‘multiple regression analysis.’

Paired sales analysis is defined as the technique of selecting data for property sales affected by the presence of HVTL, as well as sales of similar properties not affected, and measuring the variance in selling prices between the paired data. The goal is to find the effect on value of one particular attribute. We found little published material that used paired sales analysis to determine any impairment of property value attributable to the presence of HVTL.

Multiple regression analysis, in which a number of property sales are



studied against sales in a ‘control’ area and analyzed and tested against specific variables for statistical significance, is criticized by some as unhelpful due to the heterogeneous nature of real estate.

Our review revealed the opinions that, because so many factors affect property value, the influence of HVTL may play only a minor role. Accordingly, results from both statistical and mathematical analysis are inconsistent. Several important issues surfaced in the literature including the nature of the path of the HVTL through a property resulting in severance damages; the size of the affected properties which could

mean closer proximity to the lines; visual impairment due to presence of the corridor and associated infrastructure; and, conversely, the view that the wide open space created by the HVTL corridor could positively affect property value (though this was likely only to occur for urban or suburban properties).

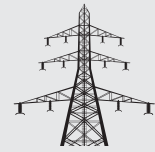
The results from analysis of the market remain contested by various researchers and authors, but there is agreement that the specific path of an HVTL corridor, its proximity to improvements and effect on view, are important concepts in determining the overall effect of HVTL on property value.

We also conducted a review of land compensation reports, to determine the degree of success landowners have had in claiming compensation for property value loss attributable to HVTL. Owners had some success claiming for a negative effect on homes and farming operations, but less so on vacant and unimproved land. HVTL infrastructure can have a negative impact on farm operations, but there is no evidence to support a claim that an HVTL can render a farm business uneconomic; any loss of value on the remaining lands is nominal at less than 5%.

It is important to discuss the perception that electromagnetic fields



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(EMFs) may have an effect on human and animal health, as a factor in perceptions of value. Health Canada has studied this issue and determined that there is no conclusive evidence of harm resulting from exposure to EMF, including in locations outside the boundaries of power line corridors. Regardless, the fear of health effects can have an effect on the behaviour of market participants and remains one of a set of factors that may impact property values.

Stakeholder interviews were another part of our review. We conducted interviews with real estate professionals — eight brokers and five appraisers. Their opinion was that mid or diagonal line crossings had a greater effect on value than other types, and that proximity was an important factor for rural residential properties. Impact was estimated at 10-20% by the brokers, who also said that marketing time for an affected property could be twice normal. Appraisers said they typically adjust downward by 3-5 % for residential properties adjacent to HVTL infrastructure. Perception of property value loss appears to be qualitative without direct market support.

A study of 10 years of data

In order to thoroughly study the relationship between HVTL and property value, we determined that the paired sales analysis approach was appropriate. We identified property sales occurring within the previous 10 years, where the properties were traversed by or abutting a high voltage transmission line. We adjusted for differences such as date of sale, the nature and age of any improvements, quality and characteristics of the land (e.g., wooded versus arable), and the parcel size. This process served to improve the comparability of properties not near the HVTL to the subject properties, so that the remaining differences in value could clearly be attributed to the effect of the power line.

Four transmission lines in Ontario were studied: Bruce to Milton; Darlington to Lennox; Lennox to Ottawa; and South Georgian Bay. In all, 77 sales of properties near the lines were identified. Transaction data was obtained from GeoWarehouse® and information on property class and improvements was from the Municipal Property Assessment Corporation (MPAC). No transactions involved the expropriating authority.

For each 'on line' (i.e., on the transmission line) sale, a search was completed in the township using MPAC propertyline™ for sales of similar type, using a date range of about 18 months before and after date of sale of the subject. This search was also refined to plus or minus \$200,000 of the subject sale price. The sales identified were further researched on GeoWarehouse to confirm details and names of the parties; each was plotted on maps depicting soil type and zoning, where appropriate. MPAC property reports provided details on the type, size and age of improvements.

Only the properties sold that possessed attributes similar to the subjects were analyzed; between one and six pairings were analyzed for a total of 210 properties off the transmission line corridors.

Results by line

The results differed slightly for each transmission corridor: for Bruce to Milton, impact on property value dropped rapidly with distance and was in the range of 0 to 5 % at 1,000 feet; Darlington to Lennox was similar with nominal impact defined as (<5%) at about 1,500 feet; Lennox to Ottawa and South Georgian Bay demonstrated a similar pattern, but the results were based on fewer data points.

For situations of multiple lines, data showed the same inverse relationship between property value loss and distance, which was particularly significant as

most of the properties studied were affected by two crossings, side by side. The value impact is not different from single line crossings: this suggests that impacts may not be cumulative. All the lines studied were built in the 1980s, which also suggests that time is a factor in the market perception of value.

Impacts by property type

Rural residential – pairings for this property type demonstrated the greatest negative impact. The properties are smaller (less than 20 acres), so improvements are closer to the transmission lines. Variances were attributed to screening, tower location, and actual distance from the line. On the positive side (for urban, suburban properties), the lines provide a green space.

Vacant land – three categories were analyzed: agricultural; potential house sites; and 'Whitebelt' land (future residential development). Results showed that in urban/suburban areas, vacant industrial lands (Bruce to Milton line) were least affected by HVTL. Land developers interviewed did not see a transmission line as an impediment to value when the holding period was long, such as 15 to 20 years.

In rural areas, the analysis showed that vacant agricultural land was the least affected by HVTL, while vacant potential rural residential land and rural residential properties were the most vulnerable, due to short separation distances. Whitebelt land seemed not to be affected.

Impact by crossing type

Five crossing types exist: side or edge clipping; diagonal; mid; rear; and side. For our study, only diagonal and rear crossings presented enough subjects for a useful sample. Our hypothesis was that a diagonal crossing would have more impact on value than a rear crossing.

The analysis confirmed that the impact of a rear crossing becomes nominal at a lesser distance (1,100 feet) than for a diagonal crossing (2,000 feet). At 500 feet, the diagonal line can result in a value loss, which is 30 % higher than for a rear crossing. Data was limited for other crossing types, but it appears the mid crossings have less impact than diagonal, while side, edge and clipping crossings are similar to rear crossings in value impact.

Conclusions

Following a detailed analysis, the conclusion is that there is a close relationship between separation and injurious affection. The impact is mainly on properties with improvements, and the value loss is averaged down in larger land holdings. There was seen to be only nominal injurious affection or loss of value on acreage properties, vacant or improved, as a result of the proposed second 500kV transmission line.

In addition, we concluded that: different types of crossings of the

Key variables in HVTL injurious affection

Separation distance
 Property type
 Crossing type
 Location
 Physical features (e.g., size, topography, presence of screening)

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HVTL corridor can impact the utility of a property, to different degrees; HVTL placement can affect efficiency of farming operations where lines run across farmed areas; the market has a negative view on HVTLs in close proximity to improvements for rural residential and hobby farms; and transmission lines can be a visual intrusion on a property diminishing

the owner's enjoyment of the property. However, in the case of residential properties in urban or suburban areas, the green space of the lines can be seen as a positive factor on value.

Based on the data analyzed, we conclude that injurious affection ranges between a high of 25% for properties relatively close to the transmission lines, to a nominal range averaging 3.47% at a distance ranging from 1,000 to 2,000 feet, and 3.1% for properties at a distance of 2,000 feet or more.

As for the approach for valuation for injurious affection from HVTL, it is evident that a case-by-case evaluation is required to ascertain the specific impact of HVTL on value. The results of statistical analysis are inconclusive; therefore, a broadly based property analysis is more useful than simply applying a mathematically derived factor.

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