6

A Review of HVOTL Studies in North America

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6.1 A Review of Existing Research

This chapter presents a meta-analysis of research undertaken to examine the impacts of HVOTLs on the price of residential property in North America and Canada.

A number of studies dating from the 1960s in the US have examined the effect of environmental issues on property prices. One of the early landmark studies on environmental disamenities was conducted by Kinnard (1967) who found high-voltage overhead transmission lines (HVOTLs) had a negligible price impact on neighbouring properties. The power line controversy has not abated since that publication. In a recent review of 16 hedonic studies, Chalmers and Voorvaart (2009) found that half the studies showed negative property impacts, while the other studies showed no impact on value caused by abutting power lines. Where impacts were found, Chalmers and Voorvaart indicated that they were usually less than 10% and normally in the range 3–6%. Similarly, a review of studies by Pitts and Jackson (2007) reports an average diminution of property values by 1–10% for proximity and/or views of a power line. They conclude:

> Both the market interviews and academic literature show that the impacts of power lines on residential properties are varied and difficult to measure. The impacts from the power lines, as well as other negative externalities, depend on many factors, including market condition, location, and personal preference. (Pitts and Jackson 2007, p. 325)

The variability in findings is supported in a PhD study by Nicholls (2002) where she found that residential properties with a view of a power line in the Lost Creek neighbourhood near College Station, Texas enjoyed a price

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premium of between 4.9% and 8%. However, Nicholls points out that the power lines were built upon a greenbelt view shed and attributed this surprising premium to the disamenity of the power lines being overwhelmed by a premium view of the tree-dominated greenbelt. Sims and Dent (2005) correspondingly point out that most power lines in the US are located in a right-of-way (ROW) corridor where residential construction is prohibited. As a result, properties adjacent to the ROW have 'the benefit and enjoyment of this extra land' (p. 666).

A review of the literature generally suggests three main reasons for the theoretical diminution of property values due to power lines. First, there is a question of the visual disamenity. Generally, where a pricing impact is present, studies indicate that the price effect is not linear; the negative impact of power lines decreases with distance (from the power lines) and typically disappears after 193 m (400 ft). There is also evidence that the negative impact of power lines is reduced or disintegrates entirely when the lines are *out of sight*. In this respect, Kinnard (1967) suggested that any diminution in price for properties proximate to power lines tends to disappear after 12–14 years, perhaps as a result of vegetation growth that acts as a cover. There is also some evidence that a view of (or proximity to) a pylon or tower provides a greater negative price impact than simply a view of a power line (Bond and Hopkins 2000).

Secondly, early studies (Reese 1967) emphasised the noise disturbance from the humming of the electricity for properties proximate to the power lines. This negative impact was also found to diminish with distance from the power line or pylon.

Finally, there is the carcinogenic health risk related to exposure to electromagnetic fields (EMF). The potential adverse health effects from EMF exposure were first reported by Wertheimer and Leeper (1979), according to Gregory and von Winterfeldt (1996). Kinnard et al. (1997) reported that the 1992 publication of two research studies by the Swedish National Institute of Occupational Health created an 'international sensation'. The first study suggested that exposure to EMFs increased the risk of brain tumours or leukaemia, while the second study suggested that children who live within proximity of HVOTLs had three times the risk of developing leukaemia. Gregory and von Winterfeldt (1996, p. 202) point out that there is no consensus in the scientific community that exposure to EMFs causes cancer directly, but suggest that they may act as cancer promoters. The lack of concrete evidence is summarised by Genius (2008, p. 121):

> With a multiplicity of views and potentially competing priorities including comfort, convenience, financial interest, health and technological necessity, a consensus on the risk/benefit ratio of EMF exposure may be challenging to achieve in the near future.

The uncertain potential for long-term adverse health effects from living near power lines poses a risk of diminution of value for properties proximate to the lines. Gallimore and Jayne (1997) point out that an individual buyer's

decision is also contingent on how other possible buyers will perceive a future health risk. The scale of this problem is considerable as Florig (1992) estimates that over 1 million homes and over 4 million hectares (10 million acres) are potentially proximate enough to power lines to be affected by higher than normal exposure to EMFs. To the extent that demand for such properties is reduced, it should *ipso facto* lead to negative premiums for power line proximate properties.

Kinnard et al. (1997) report the results of opinion surveys among professional valuers and lenders and find that these experts tend to be more negative than the attitudes revealed by residents in affected neighbourhoods. For example, a survey of 219 appraisers by Delaney and Timmons (1992) estimated that property value is decreased on average by 10.1% if the property is located near a HVOTL. Although the authors did not ask this question, they postulate that the upper end of the range is for properties adjacent to the HVOTL transmissions lines whereas the lower value is for properties in site of the transmission lines. They also found the diminution in value varied by the part of the country the homes are located in; New England saw the highest impact with an average of a 15% decline in value. Interestingly, the highest estimates of price diminution were reported by appraisers who reported no experience valuing such properties. Moreover, most opinions tend to be higher than the results reported by hedonic studies. Chalmers and Voorvaart (2009, p. 229) describe this paradox as:

> … the apparent inconsistency between these statistical results and the intensity of opposition that new transmission line corridors generate. How can it be that if people are so intensely averse to HVTLs, we do not see more of a market effect?

One hypothesis for this inconsistency is that empirical studies of power lines suffer from methodological issues and have not taken into account the latest spatial analysis techniques that might shed additional light on this issue.[1] Alternatively, Kroll and Priestley (1992) argue that the perceptual dimension of measuring the impact of power lines is difficult due to the complexity of the issues involved, particularly for research focused on the perception of value impact. They conclude (p. 33):

> The body of research is small, and much of the work suffers from the fact that it has only been in the past few years that development of hypotheses and research designs in this area has reached any degree of sophistication.[2]

Although this quote is taken from 1992, there is still relatively limited work that has examined these issues. In fact, Pitts and Jackson (2007) suggest that there may not be a market consensus on the impact of power lines with some individuals indifferent to their proximity and others strongly averse. The following section reviews the literature of power line studies in the US and provides a critique to assist real estate professionals in future studies.

6.2 Hedonic Studies in the USA

The literature reveals that studies into the impact of power lines during the last half a century have produced mixed findings. Early studies often found only a negligible negative impact of high-voltage transmission lines (HVOTL) on the pricing of residential property. However, many of these studies are of questionable validity due to their source of funding (by the power line companies) or quality of statistical techniques (Kroll and Priestley 1992).

Colwell (1990) casts doubt on the accuracy of early studies measuring the impact of power lines on proximate property due to a combination of two factors. First, he argues that the studies tended not to hold the site area constant. For example, Kinnard (1967) suggested that any negative impact from adjacency to power lines tended to be compensated by larger lot sizes, but did not statistically measure such effects. Secondly, Colwell points out that the larger size lots are further enhanced by rights-of-way that provide substantive greenbelt access for the residential property owners.

Colwell (1990) analysed 200 properties within 365 m (400 yards) of power lines in Decatur, Illinois. The data was previously used in an earlier study by Colwell and Foley (1979), with two new additional variables examining the distance to a tower and the impact of easements. The other key element analysed by Colwell was the marginal price impact through time. Colwell's hedonic model found a diminution of sales price with increasing proximity to the power lines, and that this impact was above and beyond the effect due to easements. The negative impact of the pylons was statistically significant at the 90% level. Interestingly, his study corroborated earlier studies by Kinnard (1967) and found that the price effect was eliminated with time. He also postulated that this could be due to the growth of vegetation that eventually obscures the view of the power lines.

The question of the impact of proximity to HVOTLs was also studied by Cowger et al. (1996). They utilised a paired-sale methodology to investigate the impact of HVOTLs with 296 subjects and comparables in Washington and Oregon for the period 1989–1992. They reported negligible results ranging from a small negative (–1.05%) to a small positive (1.46%) impact on values for the four different counties surveyed, although none of the results were statistically significant.

A frequent criticism of match-paired studies is the problem of matching appropriate pairs of properties (Kinnard and Dickey 1995). Indeed, this problem was recognised by Wolverton and Bottemiller (2003, p. 244) who criticised the original study (Cowger et al. 1996) for its inability to 'control for differences between subject and comp'. The authors expanded the original database from 296 to 712 cases including 300 properties abutting transmission lines. Analysis of covariance (ANCOVA), a form of regression analysis, is used to test for the influence of the transmission lines on abutting properties. The ANCOVA regression model contains a vector of 31 concomitant variables (including dates, site variables, location variables and house variables) for the two groups, abutting and not abutting the transmission lines. They also constructed models utilising nominal prices and natural log of nominal prices as the dependent variable. Their results

found no statistical significance for a diminution of value based on proximity to the power lines. Finally, Wolverton and Bottemiller (2003) also designed a model that included interaction variables (year of sale *x* abutting an HVOTL) to test if home price appreciation for homes abutting transmission lines was lower; no difference was found in appreciation rates. Despite the application of more rigorous methodology, they conclude that their results are congruent with the original Cowger et al. (1996) study.

A minor negative impact (less than 1%) for proximity to power lines was also found by Ignelzi and Priestley (1991). They studied six neighbourhoods in northern California that were affected by transmission lines. Ignelzi and Priestley provide photos of the transmission lines and towers. Most of the power lines were originally 18 m (60 ft) towers carrying 115 kV lines. However, the effect on value became pronounced when new 50 m (165 ft) towers carrying 230 kV lines were introduced into an established neighbourhood, decreasing price by 12%. The authors analysed the value impact over time and found that the magnitude of the negative impact diminished within 5 years, suggesting that the visual impact was no longer as important to residents as when the towers were first constructed. The authors also analysed the impact of power line rights-of-way (ROW) and found that when they were landscaped and integrated into useable open space (bike paths, walkways, etc.) that were in close proximity to the properties, property values increased by up to 10%. Separating the positive impact of one attribute (green space) and the negative impact of another (proximity to the power lines) is very difficult. The authors conclude that planners should be careful when modifying above-ground power lines in established neighbourhoods and wherever possible, the negative externality should be coupled with a positive amenity. In addition, they recommended that it was important to gain community support at the outset of such projects.

Similarly, Mitchell and Kinnard (1996) found no measurable price impact related to the construction of 345 kV lines in Orange County, New York. They examined the sale of 376 parcels of vacant land located within 1200 m (4000 ft) of the power lines that were in the process of construction. This study replicated an earlier study of the same area (Kinnard et al. 1989). Both studies found that the average price increased over the time period, suggesting that the proximity to HVOTLs became less important, due perhaps to a rising market, screening or familiarity.

A summary of the literature that measures proximity to power lines is detailed in Table 6.1. The studies have found a 0–12% decrease in values for proximate properties with a negative price impact diminishing with distance from the power lines.

One of the more recent studies, Chalmers and Voorvaart (2009), examined the influence of power lines in four areas in Massachusetts and Connecticut that were within 610 m (2000 ft) of a transmission line corridor. They found it striking that there was no statistical impact on the sales price associated with proximity to the transmission lines. They conclude that the only impact that was statistically significant at the 95% level was the encumbrance associated with HVOTLs rights-of-way, but that their effect on value was

Table 6.1 North American studies of the price impacts of power lines.

Study	Location	Sample dates	Sample size	Percentage decrease in price	Power line type	Type of study
Chalmers and Voorvart (2009)	New England	1998–2007	1286	1. No evidence of systematic effects of either proximity or visibility 2. Properties encumbered with an easement are affected	345 kV	Hedonic
Colwell (1990)	Decatur, Illinois	1968–1978	200	1. 6.6% at 15 m (50 feet) 2. 2% at 61 m (200 feet) 3. Price impacts decrease over time	138 kV	Hedonic
Colwell and Foley (1979)	Decatur, Illinois	1968–1978	200	1. –8.8% at 15 m (50 feet) 2. –3.6% at 61 m (200 feet)	138 kV	Hedonic
Cowger et al. (1996)	Oregon/Washington	1990–1991	296	Small negative (–1.05%) to small positive (1.46%), but not statistically significant	115–500 kV	Matched pair study
Delaney and Timmons (1992)	47 States and Puerto Rico	1990	219	Mean decline of 10% related to power line proximity	N/A	Survey of appraisers
Des Rosiers (2002)	Greater Montreal	1991–1996	507	1. –10% for direct view 2. –14% where setback is 15 m (50 ft) 3. –15 to –20% for higher price properties	315 kV	Hedonic
Hamilton and Schwann (1995)	Vancouver	1985–1991	12,907	1. –6.3% for properties adjacent to a HVTL at 100 m 2. –1.1% at 200 m	60–500 kV	Hedonic
Ignelzi and Priestley (1991)	North of Berkley, CA	1976–1989	1816	1. –1% effect on sales prices of most properties at 91 m (300 ft) 2. Adverse effects can range up to –12%	115–230 kV	Hedonic
Jackson (2010)	Rural Wisconsin	N/A	385	1. –1.1% to –2.4% discount for parcels (not statistically significant) 2. Easement area: –16.0% to –35.3%	115–345 kV	Hedonic

Kinnard (1967)	Hartford, Connecticut	1954–1964	791	1. Limited impact of –3% at 61 m (200 ft) 2. Tends to decrease substantially over time	Varied	Hedonic
Kinnard et al. (1997)	Suburban St Louis, Missouri	1990–1996	1377	–0.2% to –4.0% at 61 m (200 ft)	Unknown	Hedonic
Kinnard et al. (1989)	Orange County, New York	1983–1987	376	1. No measurable price impact for adjacent vacant lots 2. –6.20% at 61 m	345 kV	Hedonic
Kung and Seagle (1992)	Suburban Memphis, Tennessee	1989–1990	47	53% considered power line an eyesore, none aware of any health risk	N/A	Survey of residents
Mitchell and Kinnard (1996)	Orange County, New York	1983–1987	376	No measurable price impact for adjacent vacant lots	345 kV	Hedonic
Wolverton and Bottemiller (2003)	Oregon/ Washington	1989–1992	712	1. No price sensitivity for abutting an HVTL right of way. 2. No evident difference in appreciation rates	115–500 kV	Hedonic

minimal. They estimated the effect to be roughly $3000 for a $300 000 property with a 1115 m^2 (12 000 square ft) easement, i.e. 1% of the price paid. Their study found no systematic negative effect for visibility; in fact, the only time that the visibility variable was statistically significant was a case where it was positive; they attributed that result to a positive influence on value from a long view provided by a property. However, this study raises several questions that are detailed below.

One of the curious elements in their study is the delineation of the power line properties. For example, in area A2 (West Connecticut), their study found that there were only seven properties within 75 m (246 ft) of the transmission lines. However, there are 32 properties that were encumbered by an easement. This suggests that 25 of the properties encumbered by an easement are at least 75 m away from the transmission line (i.e. further away). This might explain why Chalmers and Voorvaart found only a small negative effect on house prices in this area for easement encumbrances. Clearly, it would be logical to expect that any negative price effect associated with a power line easement encumbrance would diminish as the distance from the transmission line increases. It would therefore be particularly interesting to isolate the price impact of the easement variable on the seven properties that are *within* 75 m of the power lines.

Another potential problem with the study is the authors' treatment of outliers. Chalmers and Voorvaart discarded 22 outliers with residuals of ±2.5 standard deviations. Although this constituted only 1.7% of the database, an intriguing question arises. Were these outliers disproportionately more negatively impacted by proximity to the power lines? One area of future research could be related to these extreme values; perhaps power lines are perceived as a small nuisance effect for most properties, but when a property is in closer proximity to the power line the price diminution becomes more severe. In other words, the negative perception that is captured in attitudinal surveys could be related to the most extreme (outliers) that are affected by power lines and their towers. Some of the hedonic models that are designed to capture the change in value may not correctly isolate the distance variable from the source of the stigma. Clearly, further research needs to be conducted in this area.

Finally, the researchers used an interaction variable to examine the impact of the recession and price downturns in 2006 and 2007 on residential prices of proximate properties. Chalmers and Voorvaart (2009, p. 239) conclude that:

> There is no evidence here to support the hypothesis of greater vulnerability of values to HVOTL effects in a down market, but is has to be recognized that the number of observations…is small for just two sale years…..more observations over a longer period would yield a more definitive result.

Unfortunately, a closer examination of their data reveals a paucity of observations. For example, in one submarket labelled A3, there were only two encumbered properties sold during 2006–2007; in another submarket labelled A4, there was only one such property sold during this time period.

This makes any conclusion statistically suspect. Moreover, Kinnard and Dickey (1995) point out that diminished price is just one way of measuring negative values of proximity to power lines; two other measures are increased marketing time and decreased sales volume. They conclude that a measurable decrease in sales volume for impacted properties can represent a real loss to the property owner.

Finally, Jackson (2010) addresses the impact of power lines on rural land values in Wisconsin. He finds that properties sold with a transmission line easement have a diminution in their value of 1.1–2.4% compared to properties that are located at least 400 m (one-quarter of a mile) away from the transmission line. As expected in a rural area, the properties that are used in the hedonic model are considerably larger than those used in other studies. In this study, the impacted properties averaged 25.43 hectares (62.84 acres). However, Jackson finds that if the entire diminution in value was assigned only to the encumbrance of the easement area, i.e. approximately 1.54 hectares (3.8 acres) per sale, and no loss in value to the remaining acreage is assumed, then the loss or encumbrance factor ranges from 16.2% to 35.8% of the value of the property that is encumbered with the easement. This illustrates how important size of land area and definitions of the variables being studied are in the process of trying to estimate the impact on property values of negative externalities such as transmission line easements.

Two Canadian studies also found a negative price impact for properties proximate to power lines. The first study conducted by Hamilton and Schwann (1995) examined four Vancouver neighbourhoods covering a sample of 12 907 transactions. They investigated the price impact on 2364 transactions within 200 m (656 ft) of transmission lines and found a 6.3% price diminution for properties that are proximate (within 100 m or 328 ft) and with a view of the towers. The price diminution decreases to around 1% as the distance from the towers increases to 200 m (656 ft).

The second Canadian study, by Des Rosiers (2002), adopts a micro-spatial approach to investigate the sale of 507 single-family houses between 1991 and 1996 in the greater Montreal area. Results showed a direct view of a pylon led to a 10% price reduction. However, in the microspatial samples where the setback is smaller at only 15 m (50 ft), then the price reduction increases to 14%. Furthermore, Des Rosiers found that higher-priced properties suffered a proportionately greater price diminution of roughly 15–20% compared to lower-priced properties. In contrast, Des Rosiers (2002, p. 297) also confirmed that a small number of properties may experience a positive price premium of between 7% and 22%, 'where proximity advantages (enlarged visual field, increased intimacy) exceed drawbacks'.

6.3 Conclusion

One of the major questions confronting valuers when valuing properties impacted by environmental disamenities is the correspondence between perception in the form of attitudinal surveys and what the data show when

Table 6.2 Studies sponsored by power companies and other interested bodies (adapted from Kinnaird 1989).

Study	Sponsor
Blinder (1979)	Applied Physics Lab, Johns Hopkins University; Power Plant Siting Program of the State of Maryland
Boyer et al. (1978)	Royal Commission on Electric Power Planning, Ontario
Brown (1976)	Saskatchewan Power Corp.
Colwell and Foley (1979); Colwell (1990)	Academic
Kinnard et al. (1984)	New York Power Authority
Kinnard et al. (1988a)	Central Maine Power Company
Kinnard and Mitchell (1988)	New York Power Authority
Kinnard et al. (1989)	Ontario Hydro

hedonic models are developed to capture the price reductions using completed sales transactions. Chalmers and Voorvaart (2009) argue that surveys are informative, but should not be used as a substitute for actual transactions found in the marketplace if they are available. Despite the tremendous amount of research into the pricing impact of proximity of residential properties to HVOTLs, there is no commonly accepted standard methodology and there are conflicting results as to their impact on values, as shown in this chapter. Part of the problem is that comparisons between studies are very difficult to make as there are a variety of different sales with different lot sizes and configurations as well as locations (Kinnard 1967; Reese 1967; Hamilton and Schwann 1995). Such varying configurations and access to easements raises serious doubts about the validity of matched-paired studies as congruent matches are unlikely to be found. There are also serious questions relating to the statistical quality of many of the earlier hedonic studies (Furby et al. 1988a; Kroll and Priestley 1992). Kinnard (1990) argues that the pre-1970 studies were neither systematic nor scientific. Sims and Dent (2005) also point out that those studies before 1979 did not factor in the health risk from exposure to EMFs.

There is also the overriding issue that many of these 'independent' studies were not actually independent and have been financed by power line companies. For example, a review of nine selected study reports by Kinnard (1990) that are presented in Table 6.2 indicate that a majority of the reports were sponsored by power companies. Similarly, a review of over 27 HVOTLs studies by Kroll and Priestley (1992) reveals that 22 were sponsored by the power companies, who obviously have a strong vested interest in showing a negligible impact on value.

Another major problem with generalising from the various studies is that the types of power lines and towers have changed over time and are different depending on the strength of energy being transmitted. The types of power lines in the previous studies have varied from 60 kV to 500 kV with the actual dimensions of the high pylon towers rarely measured and analysed in

the studies. For example, Chalmers and Voorvaart (2009, p. 227) examined 345 kV lines mostly on 40 m (130 ft) high pylon towers, but observe that the historical research 'only occasionally has dealt with this corridor configuration'. In many of the studies the authors have not provided the appropriate amount of detail in order to make direct comparisons between studies. The scale of the value diminution would be expected to vary according to the size of the power line and/or the height of the pylon towers.

There are other key issues that have not been adequately tested in most of the North American studies and need to be considered. As far as we could tell, there is no known academic study in the US that utilises GIS-based view shed analysis in order to provide a more scientific definition of the view corridor/quality as well as the distance of the view. Similarly, Kinnard and Dickey (1995) point out that increased time on market and decreased sales volume are also indicators of diminution of market value; there have however been no studies that satisfactorily examine these factors as these variables are very hard to measure. Reese (1967) suggests that proximity to power lines may affect the absorption rates for vacant lots, but they did not attempt to measure it. Clearly, absorption rates change as market conditions change. Falling real estate markets will more drastically impact the success of a project that has some sites hindered by a transmission line than buoyant markets where demand is high (and commonly supply is constrained). In the latter case, anything sells and buyers are willing to compromise on their tastes and preferences simply to procure a property. To date, there has not been a study that takes into account a full market cycle to look at this marketability question. Kinnard (1998) also suggests that the first indicator of market problems is a decline in volume and hedonic models must be supplemented with an analysis of the sales volume in impacted areas in order to fully reflect market realities.

Finally, a study needs to look at the outliers and whether the degradation in values is concentrated on a small number of properties that suffer extreme effects due to their close proximity to the towers. For example, Sims and Dent (2005) excluded 13 outliers from their study, but noted that these outliers sold at half the price of comparable properties.[3] Similarly, Chalmers and Voorvaart (2009) discarded 22 outliers from their study with residuals of ±2.5 standard deviations, and it is unclear if the majority of the outliers were close to the transmission lines or far away. The choice of standard deviations makes sense for the properties located further away, but not for those in close proximity to the transmission lines. The treatment of outliers is not discussed in many of the studies. The extreme price effects of outliers may also help explain the negative feedback of respondents in some of the attitudinal surveys.

Perhaps, one of the most telling comments is provided by Reese (1967, p. 560). He stated quite simply:

> If I were offered the choice between two houses, identical in detail and location, but one having no power line near and the other having such a line would this single difference have any monetary significance for me? My answer is yes.

There are a number of methodological issues in the studies reviewed that suggest that further research in this area, especially research that incorporates the latest spatial techniques, is independently funded and is corroborated with other investigative techniques (e.g. surveys), is warranted.

Notes

1 There are standard problems that need to be addressed in the formulation of a theory-based hedonic pricing model including homoscedasticity, multicollinearity, functional form and specification of independent variables. These are mentioned in Chapter 2, but a technical discussion of these issues is available in any standard econometric textbook.
2 Accordingly, Kroll and Priestly (1992) focuses on hedonic valuation models. Delaney and Timmons (1992), Kung and Seagle (1992) and Kroll and Priestley (1992) provide a summary of perceptual studies.
3 A telephone interview with the planning office confirmed that the HVOTL had a severely detrimental impact on the pricing of these properties (Sims and Dent 2005).

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Summary

Peter Dent

This section of the book has provided some insights into whether there is any evidence that proximity to high-voltage overhead transmission lines (HVOTLs) and pylons has an impact on property values.

Chapter 4 concentrates on experience in the UK, describing research findings from studies in Cumbernauld (Scotland) and Birmingham (England). Gathering transaction data in England and Wales is difficult, so Scotland was chosen as the site for initial study. The whole survey in Scotland was completed over ten years to 2010. The characteristics that were used were placed in three categories (property, HVOTL and spatial). These were then included in four regression models adopted for analysis. The results from these show that there is a causal relationship between selling price and both the physical distance from a pylon (as opposed to a HVOTL) and the degree of visual encumbrance of a HVOTL. From this research, the evidence suggests that values of property within 100 m of a pylon can be reduced by an average of 21% compared to similar properties sited 400 m away.

These findings led to a further study in 2010 in England to determine whether similar conclusions could be reached by using asking price as well as transaction data. Multiple-regression analysis together with frequency analysis was once more adopted, and the study used the same variables as the Scottish study apart from the 'view' variable. The findings from this more recent study suggest that asking price does not give a true picture of the real impact of a HVOTL on house prices. The inference from this may be that valuers underestimate the impact on proximate properties. There was also some evidence that more properties close to lines and pylons were withdrawn from the market. Specific reasons for this were not explored, but could be due to difficulties in obtaining finance.

It would also seem that agents increase their perception of value where the property has a green view, regardless of whether that green view includes a pylon. However, the perceived premium for having an improved view was not reflected in the transaction data. This suggests that agents are speculating on likely impacts on prices (a premium for a green view versus a decrease in price due to the presence of a pylon nearby), whereas purchasers actually do account for the presence of pylons and HVOTLs in their pricing decisions.

Towers, Turbines and Transmission Lines: Impacts on Property Value, First Edition.
Edited by Sandy Bond, Sally Sims and Peter Dent.

Chapter 5 reports on sponsored research undertaken for Transpower in New Zealand based on data for sales that occurred between 1989 and 1991. Despite the age of the study, the findings are instructive. The first part of the study adopted multiple regression analysis to test if there is any relationship between proximity of HVOTLs and pylons on house price. A number of models were tested. The variables included in the final model that had a statistically significant influence on price were specific property features, location, changes in the market and HVOTLs and pylons. The results suggest that having a pylon within 15 m of a property could reduce value by around 20%; at 50 m this reduction drops to around 5%. These results are generally consistent with those from the UK.

Following on from this analysis, an opinion survey was conducted. The survey results indicate that a fifth of the respondents had HVOTLs crossing over their property and a third of the respondents had a full view of one or more pylon. The main concerns residents had about the HVOTLs and pylons were their unattractiveness as a feature in their neighbourhood, the perceived impact of noise, health and safety, and the impact on resale value of their homes. However, it did not appear that negative attitudes towards HVOTLs were reflected in sale prices. Similar to the UK study, it was only the proximity of pylons that had any significant effect on values, and this effect rapidly decreases as distance to the pylon increases.

From these specific studies, Chapter 6 considers the secondary data available in North America to see if findings from the various US impact studies reviewed are consistent. These previous studies suggest that the main reasons for a potential diminution of value are visual disamenity, noise disturbance and carcinogenic health risk. However, the literature reveals that half a century of research on the impact of HVOTLs on property values has produced mixed results. Many early studies were conducted or sponsored by power line companies and statistical analysis tended to be superficial. This may suggest that results are not independent or reliable. They conclude that, although proximity to HVOTLs/pylons may cause prices to decrease by up to 12% on average over all the US studies reviewed, this figure may need to be treated with a degree of caution.

Overall, the findings in this section of the book suggest that methodology has become more sophisticated and advances in technology have opened the opportunity to explore, in greater detail than previously possible, the variables that may lead to price impacts from HVOTL proximity. It is the role of the valuer to use these objective measures to inform their subjective opinion. There seems to be no clear correlation between price and distance but, nevertheless, instinct combined with the correct selection and use of analytical tools can enable the valuer to provide superior advice to clients.