

**THE EFFECT OF HIGH VOLTAGE TRANSMISSION LINES
ON REAL ESTATE VALUES:
A REVIEW OF THE APPRAISAL LITERATURE
May 2011**

This report was prepared by Russell Thibeault of Applied Economic Research at the request of Dana Bisbee Esq. of the Devine, Millimet law firm with compensation from Northeast Utilities.

By way of disclosure, Russell Thibeault, President of Applied Economic Research, has previously performed valuation studies of right of way values for the Public Service Company of New Hampshire. The Public Service Company of New Hampshire is owned by Northeast Utilities, which is overseeing an effort to expand its network of New England transmission capacity through New Hampshire in conjunction with Hydro Quebec.

The purpose of this literature search is to provide a synopsis of the appraisal literature addressing the issue of the impact of High Voltage Transmission Lines (HVTLs) on real estate values. The primary focus is on research appearing in professional appraisal journals since the year 2000, including the *Appraisal Journal*, published quarterly by the Appraisal Institute and *Right-of-Way* published quarterly by the International Right-of-Way Association. These two publications are well regarded in their respective fields. Relevant articles appearing in *The Journal of Real Estate Research* and the *Assessment Journal* were also examined. Recent studies were selected because they are likely to be more reflective of recent attitudes of buyers and sellers. Several older but particularly relevant studies are, however, also examined. Study sponsorship, when cited by the author or peers, is noted. While there is no transparent bias in the recent studies reviewed, it is nonetheless appropriate to note that several of those studies were funded by the electric utility industry, including Northeast Utilities and Hydro Quebec.

The issue of the impact of transmission lines on property values frequently arises when new projects are proposed and when right-of-way acquisition is initiated. The immediate catalyst to this research is the proposed Northern Pass transmission line, which will extend some 180 miles from the Canadian border to southern New Hampshire. The transmission line would create a new connection between Hydro-Quebec's primarily hydroelectric resources and the New England power grid, supplying electricity to customers in the New England region. Approximately 40 miles of the proposed route will consist of new right-of-way between the New

Hampshire/Canadian border and Groveton, New Hampshire. An additional 8-mile section of the route through Concord, Chichester and Pembroke may also consist of new right-of-way development. The balance of the project will follow existing rights-of-way.

Synopsis

The majority of the literature reviewed¹--covering 50 or more studies conducted over several decades in a variety of settings by several dozen researchers using a variety of techniques-- finds that High Voltage Transmission Lines (HVTLs) have a modest or no measurable impact on property values. Many of the studies find no impact and those that do find an impact generally find that the impact is under 10% and that it diminishes quickly as distance from the transmission corridor increases—diminishing greatly beyond 50 feet from the easement and generally disappearing at distances beyond 200-500 feet. Several of the studies cited do find a more significant impact, but these stand in contrast to the majority of the findings. At least one study found an *increase* in value as a result of improved views and the perceived preservation of open space from adjacent land. Overall, however, modest or no price impact is revealed-- these “outlier” studies notwithstanding.

The reviewed studies differ greatly in the level of detailed data they incorporate and the rigor of the analysis. As noted in the following accounts of the reviewed research, a few of the studies consider whether an easement crosses (encumbers) the impacted property, versus whether the property is adjacent to the easement. None of the studies allow for the compensation paid for the easement at the time it was acquired. If they did so, the net impact reported would be offset in whole or in part by that compensation.

The findings of the reviewed studies are inconsistent with many of the opinions expressed by potentially affected landowners when a project is proposed, including the proposed Northern Pass. What underlies this inconsistency? Some peer reviewers of individual studies, as noted in the following summaries, believe that the measurement techniques (which include paired analysis of sales of similar properties (1) impacted and (2) not impacted by HVTLs and more rigorous regression statistical analysis) are too crude to pick up value changes attributable to the

¹ “Reviewed” includes articles summarized on the following pages and prior research cited in those summaries.

presence of an HVTL. While it is true that no analytical technique is perfect, the consistency of the findings, based on diverse techniques at different points in time in different geographic settings by diverse researchers tends to refute this view. If there was a consistently large impact, those impacts would likely be revealed by the techniques relied on in the studies examined in the course of this literature review.

The concern of potentially impacted landowners is understandable. Few would be indifferent to the introduction of an adjacent HVTL. But the question posed in the research is not whether people are indifferent to HVTLs, but rather—*does the impact rise to the level of having a consistent, major, measurable impact on property values?* The majority of the research examined in this literature review indicates it does not.

The value of real estate is driven by a host of factors and personal preferences. The presence of an HVTL line is but one of a multiplicity of factors taken into account when buying or selling real estate. Simply put, the research suggests that the presence of an HVTL is not a primary consideration for all (or possibly most) buyers. Most of the studies find that the measurable impact of an HVTL on value is generally less than 10 percent or not evident. Some buyers may be deterred and look elsewhere; others may not.

As several of the researchers note (and as common sense dictates) these research findings should not be applied to every property in every setting impacted by an HVTL. In some settings and for some properties, an HVTL will have a significant impact on value. In those instances where the easement crosses a property, property owners have a well-established right to full compensation for both the land under the easement and loss in value to the remainder of their property—they are made whole. Only a site-specific analysis, however, can authoritatively establish the impact on a particular property or group of properties.

Overview of the Research

Articles reviewed in the course of preparing this analysis, including those examined by AER and older research cited in the examined literature, stretch back some 50 years. As noted by Priestley

(2007)², the fundamental purpose of this body of research is to answer the question: “Does the presence of high voltage overhead transmission lines on or near a property affect the value of that property?” If effects are present, additional dimensions explored in some of the research include:

What is the magnitude of the effect?

What characteristics of the line or right-of-way are associated with that effect?

What types of property are most vulnerable to impacts?

Do impacts change over time?

Does proximity to a transmission line affect appreciation?

To what degree are transmission line property value effects influenced by concerns about electric and magnetic fields?

Priestly goes on to note that there are three basic methodologies deployed in these studies:³

Appraiser Studies. These studies include paired sales analysis in which sale prices for properties located close to the transmission line are contrasted with the sale prices of matched properties located in areas presumed to be out of the transmission line zone of influence.

Attitudinal Surveys. These studies explore the opinions of property owners and/or real estate professionals as to their perception of the effect of transmission lines on property sales values.

Statistical Analyses. Statistical analyses began to appear in the 1970s. These studies rely on a statistical comparison of the sale price of properties close to or abutting a transmission line as compared to properties away from the transmission line. They typically utilize regression analysis, which endeavors to correlate price/value with a multiplicity of factors (unit size, lot size, number of bedrooms, year built, proximity to the transmission line, etc.).

None of these techniques is perfect. The appraisal studies suffer from the difficulty of finding true paired sales or adjusting sales for the passage of time, unit condition, etc. The attitudinal surveys can be heavily influenced by prevailing media coverage, sample selection and anecdotal comments. Regression analysis requires large amounts of data and careful coding and interpretation of that data to generate reliable results. There is not, however, a material difference in the fundamental conclusion of a modest impact using these different methodologies.

² Thomas Priestly, PhD. *Transmission Lines and Property Values: Review of the Research and Summary of Key Findings*. Prepared for New York Regional Interconnection, Inc. May 2007.

³ Priestly (2007) Page 3.

An additional caveat is important to note. All these studies are generally designed to reflect the central tendency of the research findings. That is, words such as “typically” and “on average” should be applied to essentially all of the research findings. As noted by Chalmers (2009)⁴:

“It is fair to presume that the direction of the effect (on property values) would in most circumstances be negative, but the existence of a measurable effect and the magnitude of such an effect can only be determined by empirical analysis of actual market transactions.”⁵

That is to say, the research reviewed indicates the findings in specific circumstances and reflects the central tendency measured by the researcher. This is valuable information and does provide substantial insight as to the effect of transmission lines on property values. As noted by Chalmers, however, there are limitations as to the applicability of the research to specific circumstances outside the studied area. In layman’s terms, “your mileage may vary.”

⁴ James Chalmers PhD and Frank Voorvaart PhD “High-Voltage Transmission Lines: Proximity, Visibility, and Encumbrance Effects” *Appraisal Journal*. Summer 2009.

⁵ Chalmers (2009) Page 240.

Thomas Jackson, “Electric Transmission Lines: Is there An Impact on Residential Land Values?” *Right of Way*, November/December 2010.

The author notes that most of the transmission line impact studies have focused on the impact of transmission lines on residential property values and that there have been relatively few studies examining the impact to rural land used for agricultural or recreational purposes.⁶

The researcher examines prior research and notes that:

“Two regression-based studies were also reviewed that considered the effects of transmission lines on rural acreage. One of these considered agricultural land from 136 to 350 acres and the other focused on recreational properties of 10 to 160 acres. Both these studies found that power line structures in easements do not have a significant impact on the price and value of rural acreage tracts.”⁷

The author goes on to examine whether or not an impact can be identified in the studied setting—rural Wisconsin, by applying regression analysis to the sale of 88 properties impacted by the transmission line and 297 properties not so affected. The conclusion of the analysis is stated as follows:

The analyses presented here investigated the extent to which rural land values in Wisconsin have been adversely impacted by the presence of high-voltage electric transmission lines. The general finding was that there were small (1.11%-2.44%) discounts that could be attributable to the presence of the lines and the encumbrance of the properties by the easements. Neither of these small differences were (sic) statistically significant.”⁸

The study does examine properties that are crossed by an easement and distinguishes whether an easement is on the edge of a property, whether it clips a portion of the property, whether it bisects a property and whether it crosses the property diagonally. The author notes:

“The results indicated that online sales in the middle pattern had an average adjusted price difference of -3.8%. The diagonal pattern was associated with a difference of -2.1%. The edge/clipping pattern sales had no loss.”⁹

⁶ Sponsorship of the research underlying this article is not disclosed.

⁷ Jackson (2010) Page 33.

⁸ Jackson (2010) Page 35.

⁹ Jackson (2010) Page 34.

Jackson does discuss the value of the actual easement area, but the discussion is vague and difficult to interpret. Suffice to say that some of the above observed value declines would probably have been compensated at the time the utility acquired the easement.

This research was the subject of a rebuttal prepared by John Schmick appearing in the March/April 2011 issue of *Right of Way*.¹⁰ In essence, Schmick argues that Jackson did not fully reflect all the factors influencing the value of rural land, such as the quality of the rural land for agricultural or timber purposes. He notes, “The general categories listed in this article (use, size, features and location) do not adequately address the fact the rural land prices are influenced by a number of additional factors....If any single factor influencing value in the marketplace is omitted from the study model, then that model may well be flawed and its conclusion meaningless.”¹¹

His rebuttal, however, offers even less analysis of factors influencing value, citing only the summary table of unadjusted sales in the Jackson analysis.

Schmick concludes: “The unfortunate part of this article is that other appraisers and right of way professionals may try to use this in their own work without understanding the questions raised here.”¹²

¹⁰ John Schmick, *Right of Way*, March/April 2011, Page 30.

¹¹ Schmick, (2011), Page 30.

¹² Schmick (2011), Page 31.

Chalmers and Voorvaart (2009) “High Voltage Transmission Lines: Proximity, Visibility and Encumbrance Effects”. *The Appraisal Journal*, Summer 2009

This article appears in the summer 2009 issue of the *Appraisal Journal*. This research was conducted under contract to Northeast Utilities. The analysis includes both a review of the literature and the results of a multiple regression analysis of a 345 Kv transmission line in nine neighborhoods located in four study areas in Massachusetts and Connecticut.

Chalmers notes that the existing literature is extensive, but of uneven quality “...ranging from anecdotal reports to large, rigorously conducted statistical studies.”¹³ Chalmers notes that there are essentially 16 studies that form the core of the professional literature and are widely quoted and cross-referenced to one another. Chalmers summarizes the findings of these studies as follows:

“Over time, there is a consistent pattern with about half the studies finding negative property value effects and half finding none.

When effects have been found they tend to be small; almost always less than 10 percent and usually in the range 3-6 percent.

Where effects are found, they decay rapidly as distance to the lines increase and usually disappear at about 200 feet to 500 feet (61 meters to 91 meters).

Two studies investigating the behavior of the effects over time find that, where there are effects, they tended to dissipate over time.

There does not appear to have been any change in the reaction of markets to high voltage transmission line proximity after the results of two widely publicized Swedish health-effect studies were preliminarily released in 1992.”¹⁴

Chalmers goes on to note that “These general conclusions have characterized the appraisal and economic literature throughout the last 25 years, and there do not appear to be any new and different trends in the research.”¹⁵ Chalmers poses an interesting question:

“One of the questions, therefore, is the apparent inconsistency between these statistical results and the intensity of opposition that new transmission line corridors generate. How

¹³ Chalmers et al (2009) Page 228.

¹⁴ Chalmers (2009) Page 229.

¹⁵ Chalmers (2009) Page 229.

can it be that if people are so intensely adverse to HVTLs (high voltage transmission lines), we do not see more of a market effect? This inconsistency is seen clearly when residents along existing HVTLs are interviewed.”¹⁶

Chalmers looks to the research to address this seeming dilemma by summarizing the results of five attitudinal studies. His conclusions are:

“A high proportion of the residents were aware of the lines at the time of purchase.

Between one-half and three-fourths of the respondents have negative feelings about the lines.

The negative feelings center on fear of health effects, aesthetics and property-value effects.

Of those who have negative feelings about the lines, the vast majority (67%-80%) report that the purchase decision and the price they offered to pay were not affected by the lines.”¹⁷

Having considered the statistical and appraisal research and the attitudinal surveys, Chalmers concludes the research review element of his work as follows:

“The general interpretation is that, even though transmission line issues have been a prominent concern in most of the communities studied, and even though the direction of effect on real estate value is generally negative, the presence of transmission lines is apparently not given sufficient weight by buyers and sellers of real estate to have had any consistent, material effect on property values.”¹⁸

The second element of his research examines the impact of 345 impacted properties in nine neighborhoods located in four study areas in Massachusetts and Connecticut. A total of 1,654 properties were considered and characterized as to their visibility/proximity to the transmission line. The settings included both suburban and rural neighborhoods. These 1,654 sales occurred in 1999-2007. Of the 1,654 sales, 1,286 were viewed as qualified for additional analysis (excluding sales that were not arm’s length, excluding duplicate sales, etc.).

The bottom line conclusion of the analysis is:

“In the four study areas examined here, there is no evidence of systematic effects of either proximity or visibility of 345- transmission lines on residential real estate values. Encumbrance of the transmission line easement on adjoining properties does appear to have a consistent negative effect on value, although the statistical significance with which

¹⁶ Chalmers (2009) Page 229.

¹⁷ Chalmers (2009) Page 229-230.

¹⁸ Chalmers (2009) Page 230.

it is measured varies. The hypothesis that proximity values are more vulnerable to transmission line effects in a down market also is considered, although no evidence supports that proposition that there are greater effects in a down market, the number of observations in the relevant period is small. Finally, the hypothesis that higher value properties are more vulnerable to transmission line effects is considered; again, the data provide no support for that hypothesis.

The professional literature cited, combined with the results reported here, support the position that a presumption of material negative effects of HVTLs on property values is not warranted.”¹⁹

He does consider whether all or a portion of the easement crosses the studied properties.

Regarding these encumbered properties his conclusion is:

The only variable that appears to have any kind of systematic effect is the encumbrance variable, which for A2 and A4 is of the expected sign in both the Zone Distance and Continuous Distance models and is statistically significant at either the 90% or 95% level. However, its magnitude is generally small. For example, for A2 the reported coefficient on the encumbrance variable in Continuous Distance Model 2 implies an effect of approximately \$3,000 for a property with 12,000 square feet encumbered and a sale price of \$300,000.”²⁰

The authors do not address the issue of whether a property is crossed by an easement, versus lying adjacent to it.

This study was the subject of two follow-up comments, also appearing in the *Appraisal Journal*. The first appeared on page 390 of the *Appraisal Journal* Fall 2009. In it, John F. Havenmeyer supports the Chalmers findings, citing somewhat anecdotal experiences in the Syracuse, New York area.

The second comment was authored by Kerry Jorgensen of Sandy, Utah and appeared in the Winter 2010 issue of the *Appraisal Journal*. This retort questions the study’s reliance on multiple regression analysis, noting for example that the model may have been influenced by the variables being correlated with each other. The effect of this is to over-emphasize the effect of some variables and under-report the impact of others. Jorgensen notes “The amount of impact in any particular case can only be estimated reliably by a trained and experienced appraiser, and multiple linear regression is but one of the tools the appraiser might look to in making that

¹⁹ Chalmers (2009) Pages 239-240.

²⁰ Chalmers (2009) Pages 237-238

determination...For a particular property the impact of power lines on its appearance, on the quality of its views and on its overall appeal are a nuanced decision that can only be made on a case-by-case basis.”²¹ Jorgensen goes on to note: “A thorough reading of the literature on the impacts of high-voltage transmission lines leads to a conclusion that the effect of adjoining an HVTL easement can range widely, which is only common sense. Reported impacts range from a small positive impact on value to a negative impact as high as 14%. The central tendency is somewhere in the range of 5% or 6%.”²²

The authors responded to the Jorgensen comments by explaining their methodology in more detail and highlighting the limitations of their findings: “...the existence of a measurable effect and the magnitude of such an effect can only be determined by empirical analysis of actual market transactions.”²³

²¹ Kerry Jorgensen, *Appraisal Journal*, Winter 2010, Page 110.

²² Kerry Jorgensen, *Appraisal Journal*, Winter 2010, Pages 109-111.

²³ Chalmers, *Appraisal Journal*, Winter 2010, Pages 111-112.

Thomas Priestley, PhD
“Transmission Lines and Property Values:
Review of the Research and Summary of Key Findings” CH2M Hill, 2007.

This report was prepared for the New York Regional Interconnection, Inc. in May of 2007. The report presents a comprehensive review of literature addressing the issue of the impact of transmission lines on property values. The report refers to an initial literature review completed by Kroll and Priestley in 1992, which summarized and evaluated findings of over 30 studies. That first review was then updated by Priestley in 2005 and then updated again in 2007 to cover the 2005-2007 period. The major findings of the Priestley literature review, which is arguably the most comprehensive uncovered in our literature search are as follows.

Impact on Single-Family Residences

The relevant findings of the literature review with respect to single-family residences are:

“Most of the research studies based on paired sales analysis have found that transmission lines have no effect on the value of nearby single-family residences. In addition, a number of the analyses using multiple regression analysis...”found that transmission lines do not have a significant effect on the sale prices of nearby properties, including single-family homes.”²⁴

“A few of the paired-sales studies as well as many of the studies that relied on multiple regression analysis found that transmission lines have a statistically significant effect on the sales values of nearby single-family residences. Although these price reduction effects are statically significant, in most cases they are not large, generally ranging from 2 to 10 percent.”²⁵

“A study undertaken by Des Rosiers (2003) in a suburb of Montreal found that in general in the areas studied, homes adjacent to the transmission line right-of-way and facing a transmission tower experienced a drop in property value of 10 percent. They also found that in specific cases, where the setback from the transmission line is very limited, the impact for homes adjacent to the line and facing a tower can be higher, ranging from 10 to 15 percent in areas with lower price homes, and from 15-to 20 percent in areas with more expensive homes.”²⁶

“A number of studies provide evidence that in some cases overhead transmission lines and their rights-of-way may have positive effects on the value of some properties. ...The most frequently mentioned benefit of having a property located next to a transmission

²⁴ Priestley (2007) Page 5.

²⁵ Priestley (2007) Page 5.

²⁶ Priestley (2007) Page 5.

line right-of-way is the advantage of having one less neighbor. ...The Des Rosiers study found that for properties located next to transmission line rights-of-way, but not right next to a transmission tower, there is a positive price impact that ranges from 7 to 22 percent. Des Rosiers also found that for properties that were not immediately adjacent to the right-of-way, but for which the transmission corridor affords views that have an open character, the presence of the corridor creates property value increases in a range of 3 to 4 percent.”²⁷

“An apt summary of the findings of the credible research on transmission line effects on property values is provided by Des Rosiers who observed that: “In short, most studies conclude that proximity to an HVTL per se does not necessarily lead to a drop in the value of surrounding properties and that other physical as well as neighborhood variables prevail in the price determination process.”²⁸

Impacts on Vacant Residential Land

The Priestley analysis cites five studies examining the impact of transmission lines on vacant residential land. Three of the studies found no effect on the value of residential land, one study did indicate some negative effect on the value of lots that are in a subdivision but unimproved with houses. One study, by the University of Quebec in Montreal in 1982, did find a significant impact on the value of second home lots when both proximity to and a view of the transmission line was apparent.

Agricultural Land

The literature reviewed by Priestley shows mixed results with respect to the impact of transmission lines on the value of agricultural land. Several of the studies found that transmission lines do not have a statistically significant effect on the value of properties crossed by the line. Other studies have found some effect, ranging from 2-20 percent. The impact on the value of agricultural land was generally seen to rise if that agricultural land also had a residential development potential.

Effects of Distance

The research cited by Priestley indicates that any perceived impacts of the transmission lines on property values declined sharply over relatively small distances. The studies cited by Priestley find that the impacts disappear almost entirely between 200 and 500 feet from the power line.

²⁷ Priestley (2007) Page 6.

²⁸ Des Rosiers (2002) Page 277 cited in Priestley (2007) Page 6.

The Effects of Time

Priestley notes “there is some evidence to suggest that the property value effects of developing a new transmission line or upgrading an old one may decrease over time.”²⁹

Impact on Appreciation

Priestley notes only one study that made an explicit assessment of the impact of transmission lines on property value appreciation. That study found “...that residences abutting the transmission line right-of-way appreciated at the same rate as the set of comparison homes located further away.”³⁰

Impact of Electric and Magnetic Fields

Although the science regarding the impact of electromagnetic fields is less than convincing, the studies cited by Priestley do not find that those concerns translate into declining property values.

The studies reviewed vary greatly in how the analysis treats distance to the easement/HVTL and whether or not the easement actually crosses the HVTL impacted properties.

²⁹ Priestley (2007) Page 7.

³⁰ Priestley (2007) Page 8.

Jennifer Pitts and Thomas O. Jackson

“Power Lines and Property Values Revisited”. *The Appraisal Journal*, Fall 2007.

This article reviews the findings of previous studies, in noting that most of the prior studies of this issue, “Many studies indicate that the HVTLs have no significant effect on residential property values.”³¹

The authors go on to note that:

“When negative impacts are evident, studies report an average discount of between 1 percent and 10 percent of property values. This diminution in value is attributable to the visual unattractiveness of the lines, potential health hazards, disturbing sounds and safety concerns. These impacts diminish as distance from the line increases and disappear at a distance of 200 feet from the lines. Where views of the lines and towers are completely unobstructed, negative impacts can extend up to a quarter of a mile. If the HVTL structures are at least partially screened from view by trees, landscaping or topography, any negative effects are reduced considerably. Value diminution attributable to tower line proximity is temporary and usually decreases over time, disappearing entirely in 4 to 10 years.

“Research has also found that the negative impacts on lots adjacent to or with a direct view of a tower or pylon may be slightly greater than impacts on lots further from the tower. This is most likely because the visual obstruction from a tower is more substantial than that from the lines themselves. The value diminution on lots adjacent to or with direct views on a tower may not decrease with tower.

“A slower absorption rate and extended marketing period for residential properties adjacent to a tower line right-of-way are observed in some studies. However, when the nearby lots are attractively developed, the lots abutting a right-of-way will sell more quickly. It has also been found that higher-end custom homes are generally more sensitive to the negative impacts of HVTL than lower-end homes.”³²

After reaching the above conclusions based on prior studies the authors interviewed realtors and appraisers in three California subdivisions including Discovery Bay near Brentwood, Summer Lake near Oakley, and Sierra View in Roseville. These communities are located in central California east of San Francisco.

The authors are somewhat casual in their research methods and, as such, the findings should be viewed as anecdotal. The findings are:

³¹ Pitts (2007), Page 323.

³² Pitts (2007), Pages 323-324.

“Approximately half of the realtors and appraisers interviewed said they had not observed negative impacts on either residential sale prices or days on market due to the presence of power lines. According to these realtors and appraisers, major factors affecting sale price and marketability of residential properties include location, the general economy, interest rates, inventory, and neighborhood amenities. ...

The remaining realtors and appraisers had observed negative impacts on homes directly adjacent to a power line right-of-way. They said that on average the indicated price discounts range between 2 percent and 7 percent for adjacent homes. For homes not directly adjacent but with a view of the power lines, average price impacts were estimated to between 0 and 5 percent, depending on the view and proximity to the lines. On average, homes adjacent to or within a view of the lines could anticipate an increase of 0 to 60 days on the market. None of the realtors or appraisers interviewed had observed any negative impacts on properties in close proximity to the lines, but without a direct view. ...

The impact of power lines on residential property values may also be influenced by a buyer’s personal preference. Some realtors and appraisers indicated that there may not be a market consensus on the impacts of power lines because some buyers may consider these power lines a nuisance and an eyesore, while other buyers do not.”³³

The study does not distinguish between whether a property is crossed by an easement versus adjacent to an easement.

This research was critiqued in a follow-up issue of *The Appraisal Journal*.³⁴ The authors of this critique begin by noting that the research for this article was supported, in part at least, by the power industry and the condemner and formed the basis for testimony in a court case and that “...the jury did not accept the government’s approach.”³⁵

The critique goes on to cite lot sales in an 11 lot subdivision in Sacramento County, wherein lots encumbered by a HVTL right of way sold at a discount of 18.6% to those not so encumbered and that the lots encumbered were more difficult to sell.

³³ Pitts (2009) Page 324.

³⁴ See David Harding et al, “Comments on ‘Property Lines and Property Values Revisited’” *Appraisal Journal*, Winter 2008, Pages 81-82.

³⁵ Harding (2008) Page 81.

Dean Chapman
“Transmission Lines and Industrial Property Value”
***Right-of-Way* (November-December 2005)**

This study examines the impact of HVTLs on industrial properties utilizing an interview technique with over 100 survey interviews with buyers, sellers, tenants, property managers and brokers in northern California, Salt Lake City and Las Vegas. The study methodology is more anecdotal than controlled and scientific.

The researcher concludes:

“For the most part, the attitude from participants in my survey is basically summed up by a broker in Roseville who sold a medical office building within 20 feet of a large lattice tower for 230 Kv lines. He said, ‘I wish they weren’t there, but the property would have sold for the same price with or without them.’”³⁶

He further notes: “The only rule of thumb to be gleaned from reading this article is there is no rule of thumb. Every property is unique and must be carefully analyzed individually based on its own characteristics.”³⁷

Chapman does address the effect of the location of an easement on a property and the effect of the extent of the property that is covered by the easement. He notes: “I was surprised to find absolutely no impact on value for typically shaped, level parcels encumbered with transmission line easements up to about 30% of the parcel’s size.”³⁸ For parcels where the easement covers a great portion of the site, he does note an impact on value, “I found several sales of parcels that had a 50% encumbrance from transmission lines with only a 10%-20% drop in value.”³⁹ He attributes this less than expected impact to the fact that ordinances control how large a building can be placed on a site to a greater degree than the easement area:

“In each of these examples, the buyer was forced to place a building on one specific portion of the parcel, but the price for the land was only slightly affected because the potential building size had not been diminished. Obviously, the most important

³⁶ Chapman (2005) Page 27.

³⁷ Chapman (2005) Page 20.

³⁸ Chapman (2005) Page 21.

³⁹ Chapman (2005) Page 21.

consideration for these buyers was building size. The visual aspect of the transmission lines was inconsequential to them.”⁴⁰

The most significant impact he found was when an easement bisected a parcel, requiring the building area to be constructed in two buildings rather than one. In that case, a paired sales analysis indicated a 38% drop in value.

For the most part this article addresses properties crossed by an easement, wherein the HVTL is actually on the property. It is worthy to note that at some point the current or a prior owner was compensated for the land underlying the HVTL and damages to the remaining land. As such, a portion, if not all, of the perceived difference in value was offset by that compensation.

⁴⁰ Chapman (2005) Page 22.

**Marvin L. Wolverton and Steven C. Bottemiller:
“Further Analysis of Transmission Line Impact on Residential Property Values”. *The Appraisal Journal*, July 2003.**

This research re-examines the findings in a prior analysis.⁴¹ In this analysis the researchers utilized the same data in the earlier study and added additional home sales that were collected but not required for the original study.⁴²

The original study utilized a paired sale methodology to identify any difference in sale price between properties abutting rights-of-way transmission lines in Portland, Oregon; Vancouver, Washington; and Seattle, Washington and those located in the same cities but not abutting transmission lines rights-of-way. The original study concluded “...no significant difference in sale price between the subjects and the comps.”⁴³ However, the original study did not utilize adequate controls for differences between the two paired sales. The authors address this shortcoming in the current article.

The current study uses a statistical technique, Analysis of Covariance (ANCOVA). A total of 712 transactions are incorporated into the data, including 300 abutting a transmission line and 312 that did not abut a line. The overall conclusion of the analysis is: “The data does not support a finding of a price effect from abutting an HVTL right-of-way.”⁴⁴ Further, they find “The data also does not support a difference in price appreciation over time for properties abutting and not abutting an HVTL right-of-way.”⁴⁵

The authors caution against generalizing from the study results:

“This conclusion cannot and should not be generalized outside of the data, however. The caution regarding generalization stems from the data not being representative of other counties and or locations.”⁴⁶

⁴¹ J. R. Coger, Steven Bottemiller and James Cahill, “Transmission Line Impact on Residential Values,” *Right-of-Way* (September/October 1996): 13-17.

⁴² The authors do not cite a sponsor for their research, but Priestly (op cit.) cites the support as being from the Bonneville Power Administration.

⁴³ Wolverton (2003) Page 244.

⁴⁴ Wolverton (2003) Page 252.

⁴⁵ Wolverton (2003) Page 252.

⁴⁶ Wolverton (2003) Page 252.

Francois Des Rosiers
**“Power Lines, Visual Encumbrance and House Values:
A Microspatial Approach to Impact Measurement”**
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This research utilizes a regression analysis examining the sale of 507 single-family homes sold over the 1991-1996 period in the city of Brossard in the Greater Montreal Area, Canada. The author notes “The author thanks the Appraisal Division of the City of Brossard as well as the Unite Expertise Immobiliere of the TransEnergie Group, Hydro-Quebec Corp., for their support throughout the study.”⁴⁷ As is true for several of the regression analyses examined in this literature review, Des Rosiers controls for a number of variables influencing property values including quality of constructions, lot size, landscaping, and most importantly, distance from the easement. He analyzes the effect of distance to the easement and to the actual transmission line as well as to the pylons supporting those lines, along with the potential view of both, but does not control for whether the line actually crosses the analyzed property.

The conclusions of the analysis are as follows:

“A residential property that is both adjacent to an HVTL easement and facing a pylon experiences a significant drop in value due to the visual encumbrance. This drop averages 9.6 percent and can be as high as 21 percent.

In contrast, properties located 1 or 2 lots away from a pylon usually benefit from a market premium, which mirrors the improved visual clearance and increased intimacy thus generated. Results obtained with the global sample show price increases between 10.5 and 12.6%.”⁴⁸

The study incorporates an extensive bibliography of the impact literature.

⁴⁷ Des Rosiers, (2002) Page 301.

⁴⁸ Des Rosiers (2002) Page 291.

Thomas Jaconetty. “Do You Want Your Children Playing Under Those Things?: The Continuing Controversy About High Voltage Electromagnetic Fields, Human Health and Real Property Values”. *Assessment Journal*: May/June 2001.

This article, designed to inform the thinking of government assessors, examines a variety of issues surrounding HVTLs and their impacts, including legal case law, health impacts and impacts on property values. For the most part, the article reviews literature and case law.

As to the impact on property values, the study reviews a sample of the literature and notes, “Considering all of the market evidence, a value loss of less than 10 percent may be a reasonable expectation for residential properties. The negative impact is possibly greater for other types of properties.”⁴⁹

Jaconetty does not address the issue of whether an easement crosses a property or other distance factors in his literature search.

⁴⁹ Jaconetty, (2001) . Page 24.

Glenn Rigdon
“138Kv Transmission Lines and the Value of Recreational Land”
Right-of-Way (December 1991)

Although this article is dated, it is worthy of note because it examines the impact of a HVTL in a rural recreational setting—in this case, rural Wisconsin. The focus of the analysis is on the impact of the HVTL on undeveloped recreational land. The analysis utilized multiple regression analyses examining sales that occurred between 1986 and 1991, a period reported to have relatively flat prices overall within this market setting. The analyst examines the sale of 46 parcels ranging in size from 40 acres to 88 acres. There were two study areas incorporated into the analysis. Both were located in a recreational area with lakes and forest resources in rural Wisconsin. The conclusion of the analysis as set forth by the author is:

“Thus, no relationship was established between sales price and the approximate distance of properties to transmission lines in Marquette County. Even when grouped, neither properties traversed by power lines, those in proximity of power transmission lines, nor those located over 3 miles away showed a statistically significant relationship with sales price.”⁵⁰

Although no specific mention is made of the impact of an encumbrance, it appears in the discussion included in this article that all or most of the properties considered impacted by an HVTL were crossed by the easement (encumbered).

⁵⁰ Rigdon (1991). Page 18.