Examining the Variables

Determining what's statistically significant in assessing proximity damages

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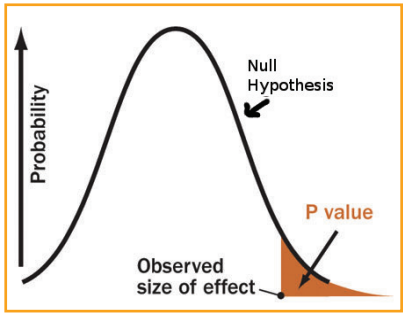
The topic of properly quantifying proximity damages is of significant importance, as it arises not only in the context of eminent domain, but also in many other areas of civil litigation involving damages to real property.

In an article titled, "A Closer Look at Proximity Damages" published in the March/April issue, the authors note several problems with typical proximity studies, including limited scope of work, and improper reliance on paired sales and published studies. They instead compiled a large property and transactional database, including 350,000 properties encompassing 127,584 transactions over the relevant time frame, to which they apply more rigorous geospatial and statistical modeling. Given adequate data, statistical modeling is preferable to paired sales and reliance on published studies. However, there are some apparent inconsistencies in the article that warrant mention.

There are four tables that show proximity coefficients—expressed as percentages—and associated P-values for three different sizes of transmission lines and another for proximity to electric substations. The highlighted "effects" or proximity coefficients in the tables are indicated to "show the most significant value impact from the transmission lines." The problem is that some of the highlighted effects have large P-values, which indicate that the coefficients are not statistically significant.



The P-value is the probability that the true value of the coefficient is zero.

In simple terms, the P-value is the probability that the true value of the coefficient is zero, in which case the observed result would not lead to a rejection of the null hypothesis. An acceptable P-value is usually less than 0.05, implying that the observed coefficient is significant at better than the 5 percent level. Very large P-values for 50-meter proximity to a 46 kV line (0.4055) and 50-100 meter proximity to a substation (0.8455) would unquestionably lead one to conclude that the observed coefficients are not statistically significant.

The authors also observe an apparent anomaly with respect to proximity to 345 kV lines, noting slightly positive effects for properties within 400 meters—as opposed to the expectation of negative coefficients—when in fact none of the P-values associated with these coefficients are significant at the 5 percent level.

Finally, they also observe that homes within 50 meters of 46 kV lines see relatively no effect. This coefficient is not statistically significant, as previously noted. But homes within 50-100 meters see a 2.5 percent decrease; "[they] expect blockage of view may be one reason for this finding." Prior studies have shown that a view of transmission lines is indeed an important factor related to proximity, which might lead one to ask whether this variable was among the 450 explanatory variables included in the model, and if not, why not.

I don't disagree that robust statistical modeling is often preferable to other methods of measuring proximity damages, but it is critical to present and discuss the numbers accurately, including the importance of statistical significance when interpreting results. ✪

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