



# The Effect of **Natural Gas** Pipelines on Residential Value

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For a pipeline expansion project in the southwestern region of the United States, the use of eminent domain was needed to acquire the necessary real estate rights for easements on both public and private land. Of particular interest was whether the values of each property's remainder portion would be influenced by the presence of a 36-inch natural gas pipeline.

While many studies have measured the effects of high-voltage electric transmission lines and oil pipelines on property values, there has been little research conducted to determine whether the presence of natural gas pipelines actually affects residential property values.

## **Pairing the Sales**

The research required that we analyze sales of properties on a natural gas transmission pipeline and properties not on a pipeline. For this study, we treated adjacent parcels as

well as parcels with a pipeline easement as being in the "on" category. All other parcels referenced are considered as part of the "off" category. We conducted the analysis using data from seven communities located in three counties.

To determine whether there was a relationship, we gathered sales price information for properties encumbered by a natural gas pipeline easement, parcels adjacent to pipeline easements and properties neither encumbered by nor adjacent to a natural gas transmission pipeline.

In analyzing the data, we used the paired-sales technique, also known as matched-pairs analysis. The fundamental principle is to isolate the influence of a characteristic by pairing two objects that are similar, except for the attribute under review. The process is typically used to estimate how property value is affected by the particular characteristic or attribute being studied.

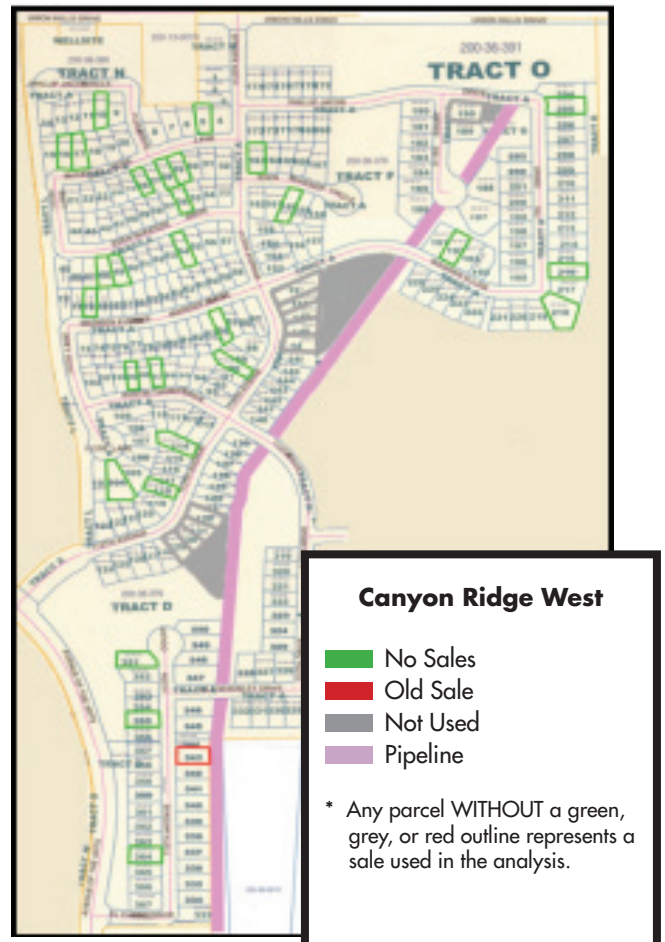


For much of the proposed route, the project parallels pipelines owned by a pipeline company other than the one proposing to install the new line. So that our data search could be as exhaustive as practical, we also sought the assistance of the Arizona Department of Revenue, whose staff provided lists of parcels with a pipeline use code for the entire state, and GIS maps for the three-county route proposed for the expansion project.

The findings are shown on a subdivision basis, along with details on how the traditional matched-pairs valuation technique was used.

### Canyon Ridge West

These parcels were located 19 miles northwest of downtown Phoenix, in the City of Surprise, where residential expansion is expansive. We analyzed 218 transactions in creating the matched-pair data set. The data for the 59 matched pairs were part of a 260-lot subdivision and had sold between 1999 and 2005. Similar in all respects, the factor isolated for analysis was location in respect to the existing gas transmission line. A plat of the sales used appears on the right.



We compared the sales of 30 properties on a gas transmission line with the 56 properties off the gas transmission line. For 20 of the 59 pairs, the per-square-foot sale prices for those on the pipeline were less than the prices paid for those off the pipeline.

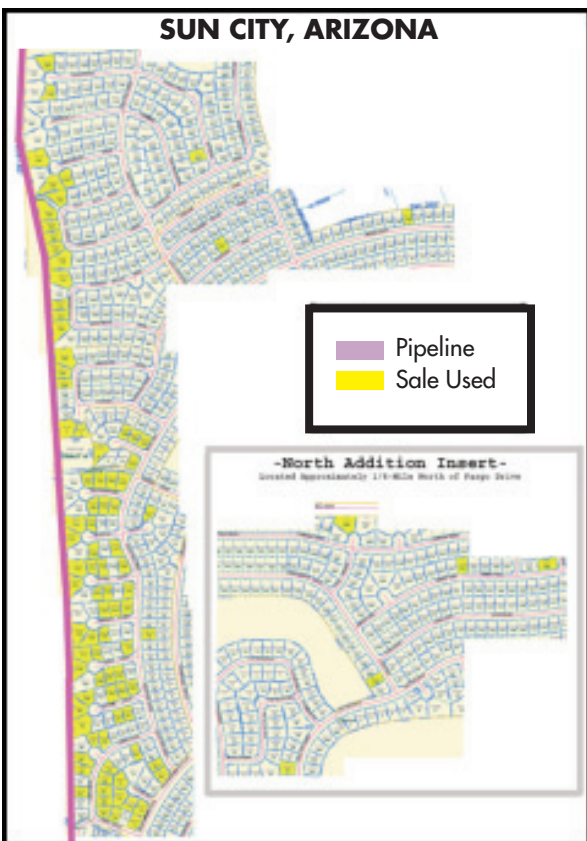
**The findings:** We found a maximum 12% deduction for being on the pipeline. We also found an 87% premium for being on the pipeline.

The erratic results show the differences between the on and off conditions are inconclusive. In essence, there is no indication of a consistent relationship between proximity and sale price.

### Sun City

These parcels were located 17 miles northwest of downtown Phoenix. By the early 1970s, Sun City was built out by the Del E. Webb Corporation. With nearly 60,000 residents, the area is considered one of the nation's top-rated retirement communities.

For the 26 matched pairs analyzed, each parcel had been constructed between 1970 and 1974, and each had sold between 1995 and 2004. Most paired homes had sold in the same month and year, and the other similarities made it easy to isolate the characteristic of adjacency to a natural gas pipeline in 25 of the 50 transactions. A plat of the sales used is shown below.



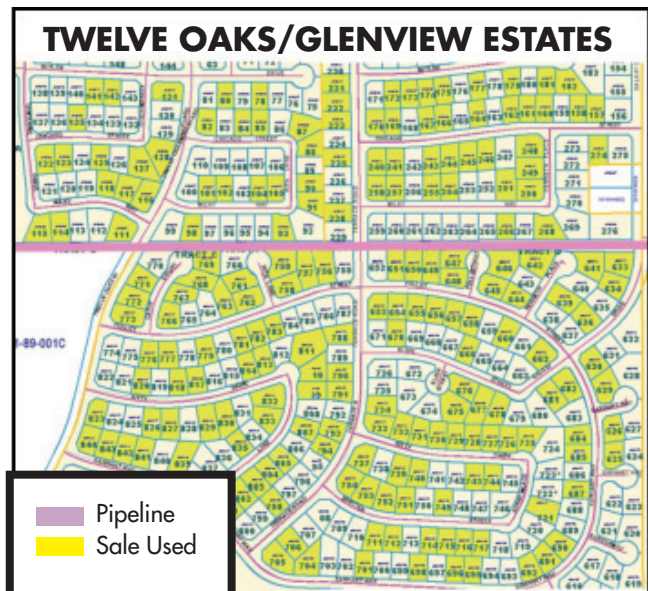
In this case, the per-square-foot sale prices for the transactions on the pipeline were less than the prices paid for those transactions off the pipeline for only 14 of the 26 pairs.

**The findings:** We found a maximum 20.88% deduction for being on the pipeline. Conversely, we also found a 39.49% premium for being on the pipeline.

Once again, the erratic results suggest that the differences between the on and off conditions are inconclusive, and no identifiable relationship between proximity and sale price could be found.

### Twelve Oaks/Glenview Estates

The parcels used here were located 14 miles southeast of downtown Phoenix, in the City of Chandler. The homes were constructed between 1983 and 1990 and the 32 matched pairs, derived from 194 transactions, shared similar qualities. A plat of the sales used in the analysis follows. The pink horizontal line represents the location of an existing natural gas transmission line.



Comparing the sales, the per-square-foot sale prices for the transactions on the pipeline were less than the prices paid for those transactions off the pipeline for only 13 of the 32 pairs.

**The findings:** We found a maximum of an 11.62% deduction for being near the pipeline. We also found, however, a 34.78% premium for being on the pipeline.

Once again, the inconsistent results illustrate that the differences between the on and off conditions are inconclusive. In essence, there is not an identifiable relationship between proximity and sale price.



## Validating the Outcome

Additional communities were also studied, all of which gave mixed results.

In the area of Poland Junction, we found a maximum of a 15.4% deduction for being near the pipeline. Yet we also found an 18.68% premium for being on the pipeline. At the Prescott Country Club, the price for the transaction on the pipeline was equal in two of the instances and 26% less than one of the properties located off the pipeline. The differences were insignificant for two of the three paired sales. In Haystack Ranches, we found a maximum of a 17.78% deduction for being near the pipeline, and a 26.76% premium for being on the pipeline. And the Prescott Country Club Mobile Villas showed differences ranging from -25.11% to 20.51%, showing that some parcels on a pipeline sold for a premium, while others sold at a discount.

## Conclusions

The goal of this research was to test whether proximity to a natural gas pipeline has an effect on real estate sale prices for the areas studied. We analyzed numerous subdivisions and gathered data on approximately 1,000 parcels. We believe that the study was exhaustive across the relevant counties.

Based on the results of the matched-pairs analysis, we could not identify a systematic relationship between proximity to the pipeline and sale price or value. Prior studies we prepared or encountered came to the same conclusion and corroborate our findings. While it would seem intuitive that the results of this study could be generalized to all geographic regions, doing so is not currently warranted, and our conclusions are presently limited to the dataset under study. Future researchers may wish to continue to examine this issue using samples from different geographic areas.

In light of the 2010 gas pipeline incident in San Bruno, California, a long-term economic impact on proximity to a pipeline may one day be revealed. It is simply too soon to reach an opinion. Furthermore, given the economic environment, the housing downturn remains with us and it will take some time for the effect, if any, to show up in the data. We suggest that additional research is necessary to achieve any conclusions about the outcome of the recent incident.



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