

An Analysis of TCAD's Commercial Valuations For City of Austin

**George W. Gau, Ph.D.
Watson Centennial Professor in Real Estate
Former Dean, McCombs School of Business
University of Texas at Austin**

**Robert S. Radebaugh, MAI
Chief Executive Officer
Aegis Group, Inc.
Austin, Texas**

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Executive Summary

The objective of this study is to determine whether improved and unimproved commercial properties in the City of Austin are being appraised at their current market values for property tax purposes by the Travis Central Appraisal District (TCAD). We analyze the relationship of the market values of the City's commercial properties as measured by their sales prices when compared to their TCAD appraised values. Our analysis is based on a sample of 735 sales of Austin commercial parcels in 429 transactions over the years of 2012 through early 2015. Our major findings are:

- Austin commercial properties have been substantially undervalued by TCAD for property tax purposes. For the period of 2012-14, the average undervaluation was 47% when measured by the median of the ratio of the property's sales price to its TCAD appraised value at the time of the sale. In other words, TCAD's appraised values for Austin commercial properties in 2012 through 2014 would have needed to increase by an average of 47% before the properties would be assessed at their market values as mandated by the Texas Constitution.
- The observed commercial undervaluation is consistent over the years of the sample. The average undervaluation in the year of the sale was:
 - 48% in 2012;
 - 44% in 2013;
 - and 53% in 2014.
- The greatest undervaluation was for unimproved and under-improved land. The average undervaluation for 2012-14 was 92% for this commercial property type. Therefore, during this period, TCAD's appraised value of the typical Austin undeveloped or underdeveloped land parcel would need to almost double to reach the level of its market value.
- Only a small portion of the undervaluation was due to the process whereby property owners can protest the initial appraised value of their property as determined by an appraisal district. The median undervaluation in the initial TCAD appraised values before protest was 40% compared to the 47% found in the final TCAD appraised values after protest.
- While initial 2015 TCAD appraised values before protest indicate some potential improvement in the TCAD undervaluation, we find that most of the historical undervaluation continues into 2015. The study estimates that the average undervaluation in the 2015 initial TCAD appraised values is 76% for C1 vacant land and 27% for F1 commercial real property.
- If the undervaluation was corrected through a challenge by the City of Austin of the 2015 initial market value of the C1 and F1 property categories, additional property tax revenue could be generated for the City in 2015. If that additional revenue was used to decrease the City's property tax rate, there would be potential savings for both Austin renters and homeowners through lower property taxes.

- The primary cause of the undervaluation appears to be the unavailability to TCAD of sales price data on commercial properties. Currently, unlike most states, there is no state law in Texas requiring mandatory price disclosure at the time of a property sale. In our review of subsequent TCAD appraisals of properties in the year following their sale, TCAD appeared to know of only 15% of the transactions that were found in this study.

Background of Study

In December, 2014 the City of Austin contracted with The Aegis Group Inc., an Austin real estate appraisal and consulting firm, to undertake an analysis of the commercial valuations of the Travis Central Appraisal District (TCAD). Aegis engaged Dr. George Gau of the University of Texas to serve as the study's team leader with responsibility for overseeing the project, designing the research protocol and analyzing the sample. Supervising the construction of the study's sample of commercial property sales was Robert Radebaugh, MAI, Chief Executive Officer of the Aegis Group. Additional information about the study team can be found in Appendix A.

Under the Texas Constitution, all residential and commercial properties in the State of Texas (with certain exceptions) are to be assessed for property tax purposes at their current market values. Under Section 1.04(7) of the Texas Property Tax Code, market value is defined as the price at which a property would transfer for cash or its equivalent under prevailing marketing conditions if: (a) exposed for sale in the open market with a reasonable time for the seller to find a purchaser; (b) both the seller and the purchaser know of all the uses and purposes to which the property is adapted and for which it is capable of being used and of the enforceable restrictions on its use; and, (c) both the seller and the purchaser seek to maximize their gains and neither is in a position to take advantage of the exigencies of the other. Generally, the best measure of the market value of a property is the sales price agreed to by a buyer and seller in an arms-length transaction. Because properties are not sold every year, estimates must be made of their market values. In each Texas county there is an appraisal district that makes those estimates for assessing property taxes.

Each year appraisal districts across Texas estimate the market values for the properties in their county. Those values are used by all of the taxing units in the county such as school districts, cities, and the county itself. They are combined with the unit's tax rate to calculate the amount of property taxes paid that year to the taxing unit by the property owners. Owners have an opportunity to protest the district's appraised values if they believe their values are above market value or if they consider the values to not be equal and uniform when compared to the appraised value of a reasonable number of similar properties appropriately adjusted. According to the TCAD's 2014 Annual Report, the initial TCAD appraised values of more than 90% of the improved commercial properties in the County were protested that year. The protest is considered by an appointed Appraisal Review Board of the appraisal district and the decision of the Board may be appealed to a district court.

Section 43.01 of the Property Tax Code gives each taxing unit in a county the authority to challenge the level of appraisals set by the county's appraisal district for any category of property if the unit believes the category is undervalued when compared to the market values of the properties in that category. Similar to a property owner's protest, the unit's challenge is heard by the Appraisal Review Board and the Board's decision may be appealed to a district court.

Research Design and Sample

This study tests whether land parcels and improved commercial properties in the City of Austin are being appraised for property tax purposes by the Travis Central Appraisal District (TCAD) at their current fee-simple market values as measured by their sales prices. A sample of confirmed property sales of Austin commercial buildings and land parcels were collected for the period of 2012 through the first three months of 2015. The sales prices of these transactions are adjusted to January 1st to determine what the sales prices of the properties would have been as of the date of the TCAD appraisal. Adjustments also are made for the value of any leasehold interests from above-market occupancy rates inherent in the transaction price to insure it is comparable to the fee-simple market values that are estimated by TCAD. To evaluate the extent of any undervaluation of the Austin commercial properties, the study calculates the average (median) percentage by which the TCAD appraised values would need to increase to have them equal the adjusted sales prices of the sample transactions.

This study is a statistical analysis of the differences between TCAD assessed values and the sales prices of a large sample of commercial properties. These sales prices were used as proxies for market value. However, these market value proxies should not be considered to be appraisal opinions of what the actual fee-simple market value of each of the sold properties were as of that date. These properties were not individually appraised by the study. Notwithstanding this, given the robust sample size, any differences between market value and the sales price proxies used in this study would have a negligible impact on the study's results.

Appendix B provides a comprehensive description of how the sample was constructed, the time and fee-simple adjustments made to the transaction prices, and the undervaluation test applied in the analysis. The study was able to successfully confirm 735 parcel sales. However, in some cases, more than one parcel was sold in a single transaction and the 735 parcels combined for a total of 429 commercial transactions for testing by the study.

Exhibit 1 gives a breakdown of the characteristics of the sample transactions by year of sale, property type, building size, and location within Austin. The study was able to confirm over a hundred sales each year for the period of 2012 through 2014. Because of the short time since the start of 2015, there are only twelve confirmed 2015 commercial sales identified for the sample. The greatest numbers of transactions over the study period were for unimproved and under-improved land parcels (165 transactions) and office buildings (141 transactions). For the three major improved property types (industrial, office, and retail), the transactions were fairly evenly distributed between large and small properties in each category when measured by building size. The number of sample transactions also was close for central locations (225 transactions) and suburban locations (204 transactions) within the City of Austin.

Exhibit 1

Sample Characteristics

Transactions By Year	
2012	161
2013	144
2014	112
2015	12
Total	429

Transactions by State Property Type	
Vacant Land (C1)	106
Commercial (F1)	247
Other	64

Transactions by TCAD Property Type	
Land	165
Office	141
Industrial	64
Retail	51
Miscellaneous	8

Transactions by TCAD Building Size	
Office – Large	72
Office – Small	69
Industrial – Large	36
Industrial – Small	28
Retail – Large	20
Retail – Small	31

Transactions by Location			
EC	81	NE	26
N	55	NW	23
NC	55	SW	22
S	46	W	21
CBD	37	SE	19
SC	30	E	13
		WL	1

Results

The major findings of the study from its undervaluation tests of the 2012-14 TCAD appraised values are presented in Exhibit 2. This exhibit shows the test results for both the initial TCAD appraised values before protest and the final TCAD appraised values after protest. It gives the median undervaluation in the total 2012-14 sample as well as the average undervaluation by year of sale, property type, building size, and location. A test of the statistical significance that is described in Appendix C is applied to each of the median undervaluations for the year of sale and the property type. Based on this test, all of these 2012-2014 time period and property type medians are significantly different from zero at less than the 1% level, meaning that the measured average undervaluations are statistically significant.

As shown in Exhibit 2, the average final undervaluation for the period is 47% when measured by the median of the ratio of the property's adjusted sales price to its final TCAD appraised value. Put another way, TCAD's appraised values in the year of sale for the total 2012-14 sample of Austin commercial properties should have been an average of 47% higher after protest to match the adjusted sales prices found in this study. The observed TCAD undervaluation after protest is consistent over the years of the sample. The median final undervaluation in the year of the sale is 48% in 2012, 44% in 2013, and 53% in 2014.

Among the property types, the TCAD undervaluation over 2012-14 is largest for the land transactions. The median final undervaluation is 94% for vacant land (C1) and 92% for the combined vacant and under-improved land parcels. TCAD's appraised value of the typical Austin undeveloped or underdeveloped land would need to almost double to reach the level of its market value. The smallest undervaluation is for large office buildings where the median undervaluation is 14%. We found that the TCAD final undervaluation is not affected by the location of the property with a median undervaluation of 47% for the properties located in the central part of Austin compared to an average of 48% undervalued for transactions of properties in the suburban submarkets.

To test the impact of the protest process on the observed TCAD undervaluation, the study calculated the median undervaluation percentage using the initial TCAD appraised values before any protest. It was then compared it to the percentage found using the final TCAD appraised values after protest. For the 2012-14 sample as a whole, only a small portion of the undervaluation was due to property owners protesting the initial appraised values of their properties as determined by an appraisal district. The median undervaluation in the initial TCAD appraised values is 40% compared to the 47% undervaluation found with the final TCAD appraised values. This result is consistent with 2012-14 protest data for Travis County commercial properties provided to the study by TCAD. In that data most of the commercial protests in the County did not cause a change in the TCAD initial appraised values.

Exhibit 2

2012-2014 Undervaluation Test Results

Median Undervaluation by Period

	<u>Initial</u>	<u>Final</u>
2012-2014	40%	47%
2012	38%	48%
2013	40%	44%
2014	49%	53%

Median Undervaluation by State Type

	<u>Initial</u>	<u>Final</u>
Vacant Land (C1)	88%	94%
Commercial (F1)	31%	38%

Median Undervaluation by TCAD Type

	<u>Initial</u>	<u>Final</u>
Land	83%	92%
Office	13%	18%
Industrial	30%	38%
Retail	59%	63%
Miscellaneous	72%	81%

Median Undervaluation by Building Size

	<u>Initial</u>	<u>Final</u>
Office – Large	5%	14%
Office – Small	30%	30%
Industrial – Large	33%	42%
Industrial – Small	23%	25%
Retail – Large	54%	63%
Retail – Small	62%	62%

Median Undervaluation by Location

	<u>Initial</u>	<u>Final</u>	
Central	43%	47%	(CBD, NC, SC, EC, W, WL)
Suburban	38%	48%	(N, S, E, NE, SE, NW, SW)

However, the impact of the protest process on the TCAD undervaluation is much greater for the larger properties in the sample than for the smaller ones. For all three of the major non-land property types (industrial, office, and retail), the differences in the median undervaluation between the initial and final TCAD appraised value are greater for the larger buildings than for the properties with smaller buildings. For example, the protest process caused an increase of the median large office undervaluation from 5% in the initial TCAD appraised values to a median undervaluation of 14% in the final TCAD values. For smaller office buildings in the sample, the protest process on average had no impact on the final TCAD appraised values. The small office undervaluation for both the initial and final appraised values is 30%. These results suggest that larger, improved commercial properties are more aggressively protested than are the smaller properties.

To measure the extent that the TCAD undervaluation continued in the year after the sale, the study calculates the median undervaluation comparing the adjusted transaction price as of January 1st of the following year and the final TCAD appraised value for that year. The median undervaluation for the 2012-14 period is 23% in the year following the sale compared to the 47% undervaluation found in the year of the sale. Based on these results, TCAD corrected about half of the average undervaluation in the sample in the year following the sale.

Some of next-year correction came from TCAD's apparent learning of the sample's transaction and using that sales price information to value the property in the succeeding year. Reviewing the subsequent initial TCAD appraisals in the year following the sale, TCAD appeared to learn of 15% of the transactions that were found by this study. In addition, there are another 8% of the sample transactions where there was no indication that TCAD knew of the sale, but they still increased the appraised value of an undervalued property in the year following the sale to within 10% of its adjusted sales price.

At the time of this study, there is more limited information available to evaluate whether the 2015 transactions are also undervalued. We only have access to the initial TCAD appraised values before protest for the twelve identified 2015 transactions rather than the final appraised values after protest that were used in the primary 2012-14 undervaluation tests. As shown in Exhibit 3, the median undervaluation in the 2015 transactions based on the initial TCAD appraised values for 2015 is 41% for the twelve properties. This undervaluation is similar to the 40% median undervaluation observed in the initial TCAD appraised values in the year of sale for the 2012-14 transactions. This finding suggests that average TCAD undervaluation in 2015 should be at the same level as the median undervaluation found over the 2012-14 period. Yet, due to the small sample size, the result cannot be viewed as definitive.

Exhibit 3
2015 Results

Median TCAD Undervaluation

2015 Initial Appraised Values:	41%
2012-14 Initial Appraised Values:	40%
2015 Initial Appraised Values of 2014 Transactions:	16%
2014 Initial Appraised Values of 2013 Transactions:	18%
2013 Initial Appraised Values of 2012 Transactions:	19%
Average of 2013 and 2014:	18.50%
Difference of 2015 Compared to 2013-14 Average:	2.50%
Percentage Difference (2.5% divided by 18.5%):	13.50%

In addition to the 2015 transactions, we indirectly test the extent of undervaluation in the 2015 TCAD appraisals by comparing the initial 2015 appraised values of the 2014 transactions to their sales prices adjusted to January 1, 2015. The median undervaluation of the 2014 transactions found in the 2015 initial TCAD appraisals is 16%. This median undervaluation in the before-protest appraisals is smaller than the comparable appraisals in the year following the sale for the 2012 and 2013 transactions. For the 2012 transactions, the median undervaluation in the 2013 initial TCAD appraised values is 19% and undervaluation for the 2013 transactions in the following-year appraisals is 18%. The 2015 TCAD appraised values thus were 13.5% less undervalued than the initial TCAD values in previous years. Because of the larger number of 2014 transactions in this test, this result is a better indication of the likely undervaluation in the 2015 initial appraised values than the test with the smaller number of 2015 transactions.

Conclusions

To recap, using a sample of 735 sales of Austin commercial parcels in 429 transactions over the years of 2012 through early 2015, the study tests the relationship of the market values of the City's commercial properties as measured by their sales prices when compared to their TCAD initial appraised values before protest and their final appraised values after protest. Our conclusion, based on the study's undervaluation tests, is that there is clear evidence of a substantial historical undervaluation of improved and unimproved commercial properties in the City of Austin by TCAD. While initial 2015 TCAD appraised values indicate some potential improvement in the 2015 undervaluation, the study's tests show that most the historical undervaluation continues into the 2015 initial TCAD appraised values of vacant land and commercial properties.

To correct this ongoing undervaluation, the City of Austin could challenge the initial 2015 appraised value estimated by TCAD for the C1 (vacant land) and F1 (commercial real property) categories. The derivation of the level of the undervaluation challenge is presented in Exhibit 4. The 2015 undervaluation is projected to be 13.5% lower than the historical 2012-14 median undervaluation in Exhibit 3. Reducing the 2012-14 median undervaluation in the initial 2012-14 TCAD appraisals by 13.5%, the resulting 2015 undervaluation is 76% in the C1 category and 27% in the F1 category.

Exhibit 4

Projected 2015 Undervaluation of C1 and F1 Categories

- Median Undervaluation in Initial 2012-2014 TCAD Appraisals:
 - **C1: 88%**
 - **F1: 31%**
- Reduction in Undervaluation in 2015: **13.5%**
- Projected Median Undervaluation in Initial 2015 TCAD Appraisals:
 - **C1: 76%**
 - **F1: 27%**

If the City should choose to challenge the 2015 initial TCAD appraised values, we recommend that the City seeks increases in the initial appraised values of C1 parcels by 76% and of F1 properties by 27%. The proposal would not be that the initial appraised values of all individual vacant land parcels in the City should be increased by 76% or that the appraised value of every Austin commercial property should be increased by 27%. Rather, TCAD should particularly look to revalue the TCAD property types where we have found they have

historically more undervalued properties to obtain the 76% and 27% increases, respectively, in the 2015 total taxable values of the C1 and F1 categories.

If the undervaluation is corrected through a challenge by the City of Austin, there would be an impact on the 2015 property tax revenue of the City. If that additional revenue is used to decrease the City's property tax rate, the 2015 property taxes paid by Austin apartment landlords and Austin homeowners could be reduced.

The primary cause of the undervaluation appears to be the unavailability to TCAD of sales price data on commercial properties. It is very difficult for TCAD to access the sales information used in this study because most of it is not publicly available in Texas. According to the Real Estate Council of Texas, Texas is one of only five states that do not require mandatory price disclosure at the time of a property sale. Without knowing the transaction prices of commercial properties, it is unlikely that TCAD and other Texas appraisal districts will appraise accurately the market value of these properties. The undervaluation of commercial properties found with TCAD probably is present in the commercial valuations of other Texas appraisal districts because they also lack public sales data on their properties.

Appendices

Appendix A - Study Team

The Team Leader for this study is Dr. George Gau. Dr. Gau holds the George S. Watson Centennial Professorship in Real Estate in the McCombs School of Business at the University of Texas at Austin. He is the Founding Director of the UT Real Estate Finance and Investment Center and the Past Chairman of the Department of Finance at the University of Texas. From 2002 through 2008 Dr. Gau served as Dean of the McCombs School of Business at the University of Texas. He received his Ph.D. in Finance from the University of Illinois, Urbana-Champaign. In 1986 he served as President of the American Real Estate and Urban Economics Association. For over thirty years he has taught real estate courses at the undergraduate, masters, Ph.D., and executive education levels and provided consulting services to various public and private organizations regarding real estate issues.

Robert Radebaugh, MAI, assisted in the study design and supervised the sample construction phase of this study. Mr. Radebaugh is the CEO of the Aegis Group and he has been actively involved in appraising commercial real estate in the City of Austin for over thirty years. The Aegis Group is a real estate appraisal and consulting firm that has performed appraisals of all types of residential and commercial properties since 1987. The President of the Aegis Group, John Coleman, MAI, SRA, participated in the sample construction and in the development of the Austin price indices for time adjusting the observed sales prices. Also, joining Aegis to help with the sample construction was Thad Chapman, MAI.

Assisting the study during the sample construction phase were students from the McCombs School of Business at the University of Texas. These students were Isabel Arrellaga, Kyle Jenkins, and Katie McDoniel. They helped with the data entry and transaction screening under the close supervision of the Aegis professionals. Lawrence Nourzad also worked on the early stages of the sample construction.

Appendix B – Sample Construction

Sample Selection

To begin the construction of the study's sample, information was collected on commercial parcel sales in the City of Austin for the period of 2012 through the first three months of 2015 from the following sources: Aegis files, other appraisal firms, CoStar, Real Capital Analytics, MLS, and the City of Austin Real Estate Department. After identifying duplicate sales data from the different sources, 1,860 parcel sales were available as potential observations for the sample. After reviewing these sales, the study excluded 455 parcels from the sample for one of the following reasons:

1. Property not located in City of Austin;
2. Sale not an arms-length transaction;
3. Not possible to separate the business and real estate values intertwined in the sale (e.g., a hotel) or there was significant business value inherent in a property with a long-term triple net lease to a single credit worthy tenant (e.g., a free-standing national drug store);
4. Improved property with a structure of less than approximately 2,000 square feet;
5. Sale of a tax-exempt property (e.g., a church);
6. Residential property having a small commercial component (e.g., ground-level retail with apartments above).

The next step was to confirm the sales prices and the conditions associated with the remaining 1,405 parcel sales to insure the recorded prices were accurate measures of the market values of the commercial properties. Some of the sources of the sales such as Aegis and other appraisal firms had already confirmed the prices and transaction conditions of the sales. However, many of the sample observations were unconfirmed and required verification from brokers, purchasers, or sellers. A number of the sales had insufficient information to undertake a confirmation and were eliminated on that basis.

The study was able to successfully confirm 735 parcel sales. In some cases, particularly for land, multiple parcels were sold to one purchaser in more than one transaction all in the same time period. For the purpose of the study's analysis, these sales were combined into a single transaction, resulting in the 735 parcels combining for a total of 429 commercial transactions for the sample.

Data Collected

For each of the sample transactions, the study collected information on the characteristics of the property including its property type, land and building size, and location within the City of Austin. Exhibit B-1 provides an example of the data collected for five transactions from the

Exhibit B-1

Sample Example

TCAD										
#	State Code	Property Code	Study Code	Land Size (AC)	Land Size (SF)	Building Size	Location Submarket	Combined Location	Date of Sale	Sales Price
1	F1	50	OFL			178,606	CBD	C	May, 2012	\$49,000,000
2	F1	46	RTL			55,276	NC	C	December, 2012	\$9,500,000
3	F1	66	INS			19,886	NE	S	June, 2014	\$1,625,920
4	C1	VL	VL	0.6271	27,316		N	S	November, 2013	\$240,000
5	F1	31	VL-I	0.75	32,670	820	EC	C	December, 2013	\$2,755,471

study's sample. The property type and size characteristics were taken from the records of the Travis Central Appraisal District (TCAD).

TCAD assigns properties to a number of state categories with the two most important for this study being vacant lots and land tracts, C1, and commercial real property, F1. They also give their own property codes to properties. TCAD property codes assigned to each improved property were combined into four commercial types for the purposes of the study:

Office:	TCAD codes 23, 26, 50-58
Retail:	TCAD codes 20, 24, 30-47
Industrial:	TCAD codes 60-69
Miscellaneous:	Other TCAD commercial property codes

The sales of the improved properties other than the miscellaneous group were further divided into additional categories for analysis based on the square footage of the building as reported by TCAD.

Office Large (OFL):	Building size greater than 35,000 square feet
Office Small (OFS):	Building size less than or equal to 35,000 square feet
Retail Large (RTL):	Building size greater than 25,000 square feet
Retail Small (RTS):	Building size less than or equal to 25,000 square feet
Industrial Large (INL):	Building size greater than 20,000 square feet
Industrial Small (INS):	Building size less than or equal to 20,000 square feet

For instance, transaction 3 in Exhibit B-1 is the sale of a small (under 20,000 square feet) industrial building (state code F1 and TCAD code 66) that sold in June, 2014.

The land sales consisted of either vacant land zoned for commercial purposes (VL) or land zoned for commercial purposes with an existing structure (VL-I) that sales records indicated was being purchased for the land value only. Participants in those sales had stated that the purchaser intended to demolish the present building and redevelop the parcel to an allowed higher and better use. For example, transaction 5 in Exhibit B-1 was the sale of a $\frac{3}{4}$ acre parcel in December, 2013 with an existing small retail structure that was purchased solely for the land value and therefore was classified as both commercial F1 and as a land VL-I transaction for the purposes of this study.

The transactions also were placed in one of thirteen Austin submarkets based on the property's location. Exhibit B-2 is a map showing the boundaries for the submarkets used to classify the location. The submarkets were then combined into either a central (C) or suburban (S) location for the purposes of the study's analysis.

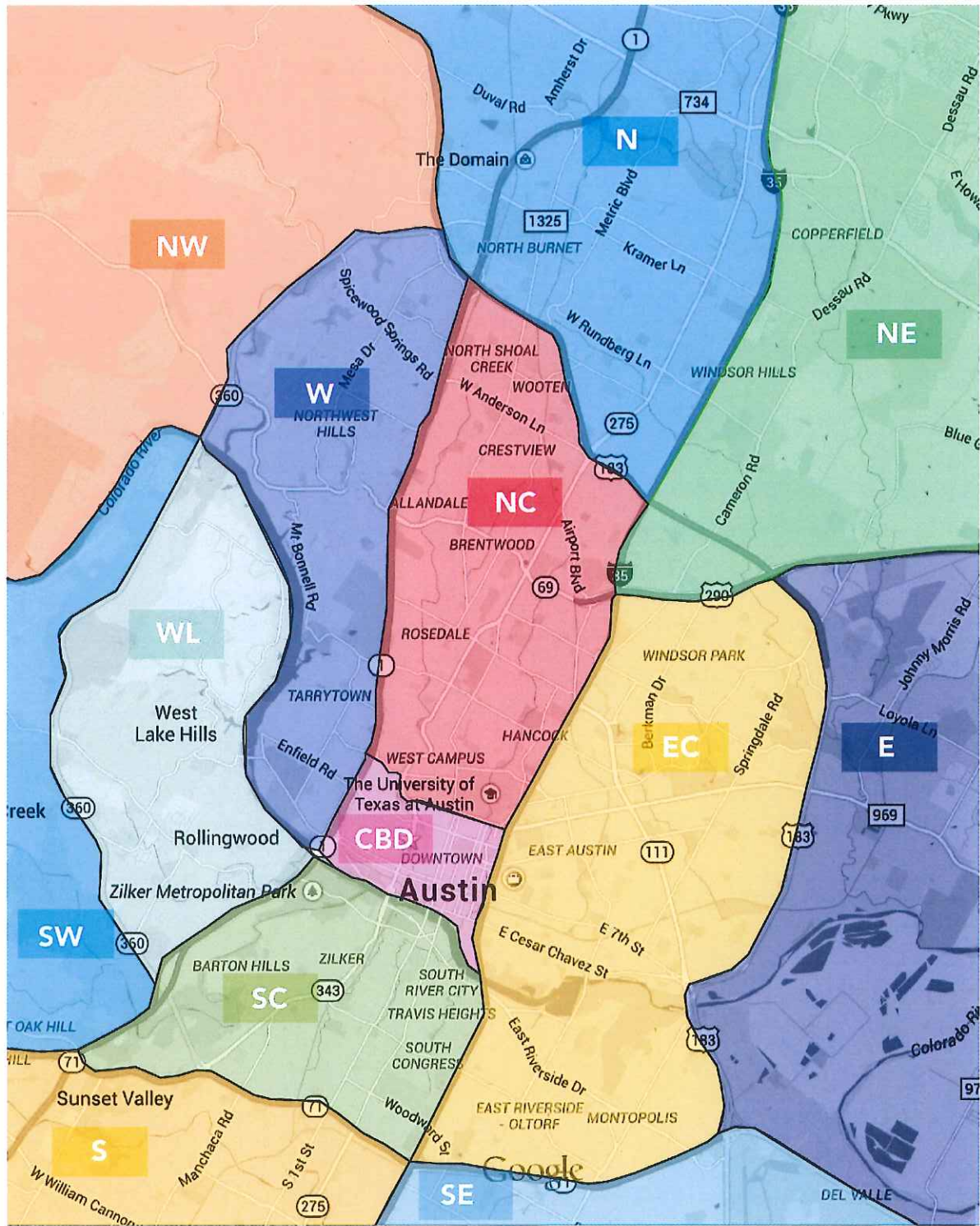
Central (C) Submarkets: CBD, EC, NC, SC, W, WL

Suburban (S) Submarkets: E, N, S, NE, NW, SE, SW

As an example, transaction 2 in Exhibit B-1 is the sale of a large retail property located in the north central (NC) area of the City of Austin that was assigned to the central (C) location for the study.

Exhibit B-2

Study's Submarkets



Time Adjustments

The next phase of the sample construction was to make any adjustments in the confirmed sale prices to reflect what the sales prices of the properties would have been as of January 1st of the year of the sale and the year following the sale. Because TCAD's annual appraised values are estimates of the market values of Travis County properties as of the assessment date of January 1st, a time adjustment was made to the sample transactions for any market price movements from the beginning of the year to the date of the transaction for the study's primary analysis of any undervaluation in the year of the sale. A second adjustment was undertaken for market price changes in the months after the transaction to determine the property's market value as of January 1st of the year following the sale. The subsequent market value was used as part of a secondary analysis of any continuing undervaluation in the year after the transaction.

Both the primary and secondary time adjustments were based on estimated annual price indices for each property type for the years of 2012 through 2014. These indices were constructed by capitalizing the average estimated net operating income (using asking rents by property type) on a square foot or unit basis to derive annual price indices for each property type. The differences in the yearly indices determined the annual price change for the property type. The monthly change that was applied to the adjustments was calculated by dividing the annual change by twelve.

Exhibit B-3 shows the resulting monthly changes by property type as well as the average asking rent, vacancy rates and capitalization rates used in the calculation of the indices. Because the most common type of development of the vacant land in the sample was the construction of an apartment building, the land adjustments were based on the changes in apartment price indices on a per unit basis over the sample period. The small number of miscellaneous properties in the sample (eight transactions) were most similar in building use to retail properties so the retail indices were utilized for the time adjustments for the miscellaneous category. In deriving all of the adjustment factors, it was assumed that the transactions in the sample took place at the beginning of the month.

To illustrate how the time adjustments were applied to the sample, consider transaction 1 in Exhibit B-1. This large office building was sold in May, 2012 for \$49 million. To find its sales price as of January 1, 2012 for the study's primary valuation analysis, the \$49 million was discounted by 1.88% ($4 \times 0.47\%$ from Exhibit B-3) or \$921,200 to derive an adjusted market value of \$49,921,200 at the start of 2012. To find its price as of January 1, 2013 for the secondary analysis, the \$49,000,000 was appreciated by 3.76% ($8 \times 0.47\%$) or \$1,842,400 to determine an adjusted market value of \$50,842,400 at the beginning of 2013.

Exhibit B-3

Time Adjustments by Property Type

Office	2011	2012	2013	2014
Asking Rent (triple net)	\$23.17	\$24.00	\$26.04	\$26.71
Vacancy Rate	11.80%	10.10%	9.30%	8.60%
Cap Rate	7.43%	7.42%	6.98%	6.66%
Price Indices	\$275.09	\$290.74	\$338.43	\$366.62
Annual % Change		5.69%	16.40%	8.33%
Monthly % Change		0.47%	1.37%	0.69%

Retail & Miscellaneous	2011	2012	2013	2014
Asking Rent (triple net)	\$19.64	\$19.96	\$19.76	\$20.68
Vacancy Rate	5.9%	5.3%	4.9%	4.7%
Cap Rate	7.16%	7.06%	6.98%	7.05%
Price Indices	\$258.06	\$267.80	\$269.28	\$279.57
Annual % Change		3.77%	0.55%	3.82%
Monthly % Change		0.31%	0.05%	0.32%

Industrial	2011	2012	2013	2014
Asking Rent (triple net)	\$7.75	\$7.34	\$8.68	\$9.21
Vacancy Rate	11.8%	8.9%	7.8%	8.2%
Cap Rate	8.71%	8.54%	7.83%	7.53%
Price Indices	\$78.46	\$78.31	\$102.17	\$112.32
Annual % Change		-0.20%	30.47%	9.94%
Monthly % Change		-0.02%	2.54%	0.83%

Apartment (Land)	2011	2012	2013	2014
Rent (annualized)	\$13.92	\$14.46	\$15.72	\$16.44
Vacancy Rate	4.72%	5.12%	4.98%	6.00%
Expense Ratio	45.0%	45.0%	45.0%	45.0%
Cap Rate	5.80%	5.72%	5.80%	5.36%
Price Indices	\$125.77	\$133.56	\$141.65	\$158.57
Annual % Change		6.20%	6.05%	11.95%
Monthly % Change		0.52%	0.50%	1.00%

Sources: Co-Star, Austin Investor Interests, PriceWaterhouseCoopers, and Aegis internal data.

Fee-Simple Adjustments

TCAD is required to estimate the fee-simple market values of Travis County properties. Most improved commercial properties are leased to other parties. If the rents or occupancy levels of these properties are above market levels, the sales prices could reflect a value for the leasehold interest and make those prices higher than their fee-simple values. In such cases any observed undervaluation by TCAD found when comparing their appraised values to the study's time-adjusted transaction prices could partially reflect positive leasehold interests in the sales price unless an adjustment is made.

When improved properties in the sample have known above-market occupancy levels, the study adjusts the transaction prices to lower them to their fee-simple values. For example, returning to transaction 1 in Exhibit B-1, the office building in this transaction was 100% leased at the time of sale while the office vacancy rate in Austin in 2012 was 10.1% (from Exhibit B-3). To derive the fee-simple value of the property to reflect the lower market occupancy rate, the unadjusted transaction price of \$49 million was reduced by 10.1% to \$44,051,000 before applying the time adjustment. A total of 57 non-land transactions had known above-market occupancy rates and their transaction prices were lowered to their fee-simple values. These fee-simple adjustments may overcompensate for the impact of any above-market occupancy levels because in some cases the higher occupancy levels may be transitory with expiring leases, reducing the buildings' occupancy to market levels in the near future.

No adjustments were required in the sample for above-market rents because commercial rents generally rose in Austin during the years of 2012-14. Any non-market rents of the sample properties were thus likely to be below-market. For properties with below-market rents, their sales prices were not biased upward when compared to a fee-simple value and any observed undervaluation would not include a positive value for the leasehold interest from non-market rents. Additionally, tenant quality and the length of the leases were addressed by removing the long-term credit transactions with a significant leasehold interest.

Adjustments also were not necessary in the sample for any seller financing at below-market interest rates. Such financing would have caused transaction prices to reflect a value for both the property and the financing. No below-market vendor financing was reported among the sample transactions during the confirmation process.

The time and fee-simple adjustments did not have a major impact on the adjusted transaction prices of the sample properties. Combining the time and fee-simple adjustments, the average percentage adjustment of the transaction prices in the primary analysis of the valuation in the year of sale was only 7%. The average combined adjustment in the secondary analysis of the valuation in the year following the sale was just 4%.

Undervaluation Test

For each confirmed transaction included in the sample, the final TCAD appraised values following any protests for the year of the sale and the year following the sale were taken from TCAD records. TCAD also provided the study with the initial appraised values determined by TCAD prior to any protests for all commercial properties in Travis County including the sample properties. Having access to both the initial TCAD appraised value prior to the protest process, as well as the final value after the appeal, the study can derive the portion of any undervaluation in the sample that resulted from the protest.

An indication of how well the study's sample of sold commercial properties are representative of the population of all of Austin commercial properties can be found by comparing the average percentage difference of the initial (before protest) and final (after protest) TCAD appraised values of the sample properties to the average percentage difference in the initial and final appraised values for all commercial properties in Travis County for the period of 2012-2014. The average change in appraised values caused by the protests was 8% in the sample properties and 6.5% among all commercial properties in the County, suggesting that the commercial properties in the study's Austin sample were representative of all commercial properties in the County.

To evaluate the extent of any undervaluation of Austin commercial properties, the study calculated the average (median) percentage by which the TCAD appraised values (AV) would need to increase to have them equal the adjusted sales prices (ASP) of the sample transactions. The study's undervaluation measure was the median of the sample transactions':

$$(\text{ASP}/\text{AV}) - 1$$

The median is a statistic commonly used as an alternative to the arithmetic mean to measure the average value of a group of numbers. The median is the middle value in a set of numbers arranged from lowest to highest. It is used primarily with skewed distributions when there are large outliers in the data that would have a greater effect on the mean than on the median. The distribution of undervaluation in the sample was skewed toward higher positive values because of some large outliers, necessitating the use of the median as the study's undervaluation measure.

In the study special attention is given to insure there were no changes in a property's improvements or entitlements (i.e., zoning, site approvals) from the time of TCAD appraisal to the time of the sale when calculating the undervaluation medians for the year of the sale and for the year following the sale. If improvements were made to the property or new entitlements were granted after January 1st of the year of the transaction but prior to the time of the sale, the undervaluation measure for that property was not included in the primary analysis for the year of the sale. Similarly, if new improvements were undertaken or additional

entitlements granted following the sale of a sample property, the undervaluation calculation was not included in the secondary analysis of the TCAD appraised value for the year following the sale.

Under the Texas Property Tax Code (Section 23.01), "the market value of a residence homestead shall be determined solely on the basis of the property's value as a residence homestead, regardless of whether the residential use of the property by the owner is considered to be the highest and best use of the property". The homestead restriction in this section of the Tax Code limits the TCAD appraised value of sample properties consisting of improved land with existing single-family residences that were zoned for commercial uses and sold for redevelopment. These properties could not be appraised by TCAD at their commercial highest and best use even though they were sold for the higher-valued commercial purpose. Four of the improved land properties in the sample had a single-family dwelling with a homestead exemption in the year of sale and the undervaluation calculation for these observations was not included in the primary analysis of any undervaluation for the year of the sale.

Appendix C - Significance Test for Median Undervaluation

Based on a statistical test described in Paul Newbold, Statistics for Business and Economics, 1995 (Fourth Edition. Prentice-Hall, pp. 386-389), this study tests whether the undervaluation medians observed in the sample transactions are significantly different from zero. To determine significance, the study tests the null and alternative hypotheses with μ being the median undervaluation in the population (all TCAD appraised commercial properties):

$H_0: \mu = 0$	vs.	$H_1: \mu > 0$
Median $\frac{ASP}{AV} - 1$ value is 0		Median $\frac{ASP}{AV} - 1$ value is greater than 0
\Rightarrow Half of the $\frac{ASP}{AV} - 1$ values in the population are less than 0 and half are greater than 0.		\Rightarrow More than half of all $\frac{ASP}{AV} - 1$ in the population are greater than 0.

Let p represent the percentage of all TCAD appraised commercial properties with $\frac{ASP}{AV} - 1 > 0$. Then $\mu = 0$ implies that $p = 0.5$ and $\mu > 0$ implies that $p > 0.5$. Therefore, a test of

$$H_0: \mu = 0 \quad \text{vs.} \quad H_1: \mu > 0$$

is equivalent to a test of

$$H_0: p = 0.5 \quad \text{vs.} \quad H_1: p > 0.5$$

If $H_0: p = 0.5$ is true, then \hat{p} (estimated sample p) should be close to 0.5, subject to random estimation error. The standard error (SE) of this estimate assuming H_0 is true is $p(1-p)/n$ where n is the number of transactions in the sample and the test statistic is $(\hat{p} - 0.5)/\sqrt{SE}$.

Appendix D – USPAP Compliance

The study undertaken could potentially be considered to fall under “Appraisal Practice” as defined by the Uniform Standards of Professional Appraisal Practice (USPAP). Although no appraisal was done on any property, actual sales transactions were used as proxies for market value and then compared to actual assessed values. These comparisons were then statistically analyzed to arrive at an indication of the percent difference between market and assessed values for various categories of properties on the Travis County tax roll.

Should it be determined that USPAP compliance is necessary, this report would represent a Restricted Report as defined by USPAP.

Identity of the Client:	The City of Austin
Intended Use:	Internal use to assist in decision making regarding a potential challenge to the C1 and F1 State Code categories of the Travis County appraisal roll for 2015.
Real Estate Involved:	This study covers all commercial property and vacant land on the tax roll within the City of Austin. A total of 429 transactions covering 735 tax parcels over a 3.25 year period were analyzed and used as the basis for the conclusions.
Real Estate Interest Appraised:	No property was appraised; however, the sales data were adjusted and used as proxies for fee simple market values as of January 1st of a given year.
Type of Value:	<p>Market value as used in this study when comparing market sales transactions to the appraised values by the appraisal district is as follows:</p> <p>“Market value” means the price at which a property would transfer for cash or its equivalent under prevailing marketing conditions if:</p>

(A) exposed for sale in the open market with a reasonable time for the seller to find a purchaser;

(B) both the seller and the purchaser know of all the uses and purposes to which the property is adapted and for which it is capable of being used and of the enforceable restrictions on its use; and

(C) both the seller and the purchaser seek to maximize their gains and neither is in a position to take advantage of the exigencies of the other.

Source: Property Tax Code, Section 1.04(7)

Effective Date:

This study covers comparisons effective January 1, 2012, January 1, 2013, January 1, 2014, and January 1, 2015. The final conclusions and recommendations are effective January 1, 2015.

Date of Report:

This report was completed May 11, 2015.

Scope of Work:

The scope of work was explained in detail throughout this report. This included details of the background and study design, data collection and analysis for inclusion, reasons for and methodology of adjustments, and the scope of statistical analysis and conclusions.

In general we attempted to collect, confirm, and analyze the universe of commercial property both improved and vacant within the City of Austin since January 1, 2012, which were considered good proxies for fee simple market value. These sales transactions were then compared to their TCAD appraised values, both initial and final for the appropriate year. Any differences were then statistically analyzed to determine the median percentage difference between these sales prices and TCAD appraised

values. The results of this were used to conclude to the percentage undervaluation of the F1 and C1 property types for 2015.

USPAP Standard 2(b)(viii):

This was not an appraisal. As such, neither the Sales Comparison, Cost, nor Income Approaches were employed.

2(b)(ix):

Not applicable.

2(b)(x):

Not applicable.

2(b)(xi):

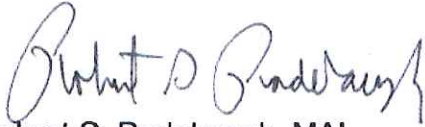
There were no extraordinary assumptions or hypothetical conditions employed in this study.

CERTIFICATION

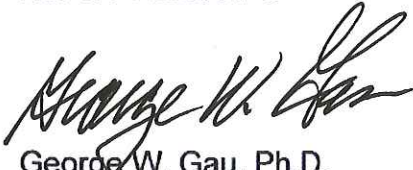
We certify, to the best of our knowledge and belief:

1. The statements of fact contained in this report are true and correct.
2. The reported analyses, opinions, and conclusions are limited only by the reported assumptions and limiting conditions and are our personal, impartial, and unbiased professional analyses, opinions, and conclusions.
3. We have no present or prospective interest in the property that is the subject of this report, and no personal interest with respect to the parties involved.
4. We have performed no services, as appraisers or in any other capacity, regarding the property (Property Tax Roll) that is the subject of this report within the three-year period immediately preceding acceptance of this assignment.
5. We have no bias with respect to the property that is the subject of this report or to the parties involved with this assignment.
6. Our engagement in this assignment was not contingent upon developing or reporting predetermined results.
7. Our compensation for completing this assignment is not contingent upon the development or reporting of a predetermined value or direction in value that favors the cause of the client, the amount of the value opinion, the attainment of a stipulated result, or the occurrence of a subsequent event directly related to the intended use of this appraisal.
8. Our analyses, opinions, and conclusion were developed and this report has been prepared in conformity with the *Uniform Standards of Professional Appraisal Practice*.
9. We have not made a personal inspection of all the properties that are the subject of this report.
10. No one provided significant real property appraisal assistance to the persons signing this certification.
11. The reported analyses, opinions, and conclusions were developed, and this report has been prepared, in conformity with the Code of Professional Ethics and Standards of Professional Appraisal Practice of the Appraisal Institute.

12. The use of this report is subject to the requirements of the Appraisal Institute relating to review by its duly authorized representatives.
13. As of the date of this report, Robert S. Radebaugh, has completed the continuing education program for Designated Members of the Appraisal Institute.



Robert S. Radebaugh, MAI
State Certified General Real Estate Appraiser
No. TX-1320501-G



George W. Gau, Ph.D.