



Government of the District of Columbia

Mayor Muriel E. Bowser

Office of the Chief Financial Officer

Mr. Jeffrey S. DeWitt

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Office of Tax and Revenue

Real Property Tax Administration

FY 2019 Assessment

Ratio Report

Real Property Tax Administration
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October 30, 2018



**Government of the District of Columbia
Office of the Chief Financial Officer
Office of Tax and Revenue**

October 30, 2018

The Honorable Muriel E. Bowser
Mayor of the District of Columbia

and

The Honorable Phil Mendelson
Chairman of the Council of the District of Columbia

Dear Mayor Bowser and Chairman Mendelson:

In accordance with D.C. Code § 47-823(c), I am pleased to submit the Office of Tax and Revenue's (OTR) Fiscal Year 2019 Assessment Ratio Report. This report measures the quality of real property assessments within the District of Columbia.

Uniform and accurate assessments for similar properties are the foundation of fair property taxation. District law and the Federal Constitution require that all real property subject to property taxation be assessed uniformly. District law also requires that assessments be based on the estimated market value (fair market value) of the property. Therefore, uniformity and market value are the standards used to measure the quality of the assessment work performed by the Real Property Tax Administration.

This report measures assessment quality by looking at the most recent reassessment program and comparing the results of that effort to actual market conditions. District law requires that all real property be assessed annually, and this reassessment resulted in approximately 200,800 reassessment notices being issued in February 2018 effective for Fiscal Year 2019. These reassessments reflected OTR's estimate of property values as of January 1, 2018. To provide an objective performance measure of that work, this report tests those reassessment results against actual property sales for the 12 months in calendar year 2017.

OTR is guided by national standards for measuring property assessment quality, as promulgated by the International Association of Assessing Officers. Those national standards and our compliance therewith are discussed in this report. The data show that the District has acceptable levels and uniformity of assessments.

I hope that you find this report useful and informative. Please feel free to contact me to share any suggestions that you may have to improve this report or the assessment process in the District of Columbia.

Sincerely,

Keith Richardson
Deputy Chief Financial Officer
Office of Tax and Revenue

FY 2019 ASSESSMENT RATIO REPORT

Overview

The Office of Tax and Revenue's (OTR) Real Property Tax Administration (RPTA) assesses real property for purposes of property taxation. A portion of all properties will be physically reviewed each year. During the review, RPTA appraisers will visit properties to verify property characteristics existing in our current assessment records. The characteristics include property type, size, quality of construction, condition of structure and any new improvements.

For Fiscal Year (FY) 2019, the District assessed approximately 206,000 properties. The magnitude of the reassessment requires the use of mass appraisal techniques. In using the mass appraisal technique, an RPTA appraiser values all properties in an entire neighborhood at a time with standardized appraisal method(s) and statistical testing. This is in contrast with the practice of a fee appraiser, who is concerned with valuing one property at a time.

When real property is transferred, the deed and transfer documents are filed with the Recorder of Deeds of the District of Columbia. These documents are imaged, used as a record to change ownership on the assessment roll, and used to capture sales information. RPTA's Assessment Division reviews all deeds and property sales prices after the deed transferring the property is recorded. In the appraiser's review and analysis of the sales, the appraiser will develop land rates, depreciation tables, and sales analysis and/or market analysis reports. After completing the analysis, the appraiser applies the factors uniformly throughout the neighborhood to value all comparable properties.

Supervisory personnel carefully review each RPTA appraiser's work, and the RPTA appraiser's work is also scrutinized by individual property owners. We are continually striving for higher quality in assessment uniformity. Our quality control program begins with the individual appraiser and the appraiser's immediate supervisor. As work is completed, each supervisor reviews the analysis, making revisions or approving the work. When the appraiser completes the revaluation, the supervisor makes a random check using procedural and data editing reports. Following the completion of the revaluation, various computer edits are made to ensure good valuation quality.

A measurement of quality is the assessed value/sale price ratio. A ratio is the relationship between two numbers; in this case it is the relationship between the assessed value and sale price. The ratio measures how closely our values compare to the actual sales prices. The average assessed value/sale price ratio indicates the typical level of assessment. Real estate market is an imperfect market; there will always be properties that sell for more or less than what can be anticipated due to factors such as sales between people unfamiliar with the market or buyers willing to pay extra for a unique property, among other reasons.

In mass appraisal and assessment ratio studies, we are not only concerned with the typical level of assessment as indicated by the average assessed value/sale price levels

(ratios), but also the degree of spread, or variation, from the typical ratio. One such statistical measurement of variation is called the coefficient of dispersion (COD). The lower the COD, the more uniform the assessments.

Subsequent portion of this report provides detailed explanation of the statistical terms as applied to assessment administration and quality control, and explain the International Association of Assessing Officers' (IAAO) Standard of Performance for ratio studies.

RATIO STATISTICS

The purpose of this ratio study is to test the quality of the assessment product of the properties most recently valued. From our most recent valuation, we have performed many ratio studies examining neighborhoods, types of structures, age of structures, etc. We use ratio studies as a performance gauge that includes several measures of central tendency. A measure of central tendency indicates the typical level of assessments to actual selling prices of real estate. These may be the average of the assessed value/sale price ratios, the weighted average of the assessed value/sale price ratios or the median of the assessed value/sale price ratios. The average assessed value/sale price ratio is simply the average of all the ratios in the sample. The weighted assessed value/sale price ratio is the result of dividing the total of the assessments by the total of the sale prices. The median assessed value/sale price ratio is the midpoint ratio of all ratios after the ratios are arrayed from highest to lowest.

While several measures of central tendency may be calculated (average, median, and weighted average), the median is less affected by extreme ratios. Therefore, IAAO observes in its standards that the median is generally the preferred measure of central tendency for monitoring assessment performance. For this reason, median ratios are used in this study to measure compliance with IAAO standards.

In addition to the general level of assessments, we are also concerned with the relative spread or variation that individual ratios depart from the typical ratio. This is measured by the coefficient of dispersion. The coefficient of dispersion is calculated by dividing the average absolute deviation by the median ratio. To calculate the average absolute deviation, subtract the median ratio from the individual ratios and add all the results, ignoring positive or negative signs, and then divide the sum by the number of ratios. The acceptable level for the coefficient of dispersion depends upon the type of properties being reviewed. According to IAAO, coefficients of dispersion should typically be 20% or less, depending on the types of properties being valued.

Another statistical measure used to gauge assessment uniformity is the Price-Related Differential (PRD). The PRD tests to see if higher and lower valued properties are assessed at the same level. PRD is calculated by dividing the mean ratio by the weighted mean ratio. PRDs should range between 0.98 and 1.03, except for very small samples. For example, a PRD of 1.03 indicates an under-valuation of high-priced properties, while a PRD of 0.98 shows an under-valuation of low-priced properties.

The central tendency statistics discussed above (mean, median, weighted-mean) are called “point estimates” because they are single numbers used to estimate values for all properties in the District. To ensure that the sample values accurately represent the population an additional test can be performed - the confidence interval.

The confidence interval can be defined as “a range of values that are believed with a particular probability to contain the true or actual average population value.” If the range of values determined by the confidence interval overlaps into the IAAO standard established for the statistic (0.90 to 1.10) we cannot reject the hypothesis that the median ratio complies with IAAO standards. If, on the other hand, the confidence interval does not overlap the desired range, we can conclude with 95% probability that assessments fail to meet the IAAO standard.

The confidence intervals measure the degree of precision of assessment levels derived from measuring the mean, median and weighted mean of statistical samples.

Other descriptive statistical methods that may be used to analyze the assessment product are frequency distributions, scatter diagrams and coefficients of variation. Due to the scope of this report, we have not fully examined these methods here. For further information on statistics relating to assessments, IAAO’s publication, "Property Assessment Valuation," is recommended.

Table 1 of this report illustrates a sample computation of these statistics.

Table 1
Illustration of Ratio Study Statistics

Rank	Parcel #	Appraised value	Sale price*	Ratio	Statistic	Result
1	9	\$87,200	\$138,720	0.629	Number (n)	17
2	10	\$38,240	\$59,700	0.641	Total appraised value	\$1,455,330
3	11	\$96,320	\$146,400	0.658	Total sale price	\$1,718,220
4	12	\$68,610	\$99,000	0.693	Average appraised value	\$85,608
5	13	\$32,960	\$47,400	0.695	Average sale price	\$101,072
6	14	\$50,560	\$70,500	0.717		
7	15	\$61,360	\$78,000	0.787	Mean ratio	0.827
8	16	\$47,360	\$60,000	0.789	Median ratio	0.820
9	17	\$56,580	\$69,000	0.820	Weighted mean ratio	0.847
10	18	\$47,040	\$55,500	0.848		
11	19	\$136,000	\$154,500	0.880	Coefficient of dispersion	14.5
12	20	\$98,000	\$109,500	0.895	Price-related differential	0.98
13	21	\$56,000	\$60,000	0.933	95% conf. int. median (two-tailed)	0.695 to 0.933
14	22	\$159,100	\$168,000	0.947		
15	23	\$128,000	\$124,500	1.028		
16	24	\$132,000	\$127,500	1.035		
17	25	\$160,000	\$150,000	1.067		

* No outlier trimming or adjusted sale price

RATIO STUDY STANDARDS - VALUES TO SALE PRICES

International Association of Assessing Officers (IAAO) is a professional organization of assessing officials that provides educational programs, assessment administration standards and research on assessment and tax policy issues. IAAO has developed numerous standards and texts on assessments and assessment administration. Additionally, the organization is a founding member of the Appraisal Foundation that developed the Uniform Standards of Professional Appraisal Practice (USPAP).

The IAAO's Standard on Ratio Studies was first published in September 1990 and was revised in April 2013. The IAAO standards are advisory in nature and provide guidance to those performing ratio studies in the mass appraisal field regarding design, statistics, performance measures and related issues in conducting ratio studies. The RPTA uses the fundamental ratio statistical measures of IAAO standards, and is guided by the criteria of IAAO's Assessment Ratio Performance Standards, to judge the performance of the District's reassessments. See Table 2 below.

Table 2

IAAO's Ratio Study Performance Standards

General Property Class	Jurisdiction Size/Profile/Market Activity	COD Range
Residential improved (single family dwellings, condominiums, manuf. housing, 2-4 family units)	Very large jurisdictions/densely populated/newer properties/active markets	5.0 to 10.0
	Large to mid-sized jurisdictions/older & newer properties/less active markets	5.0 to 15.0
	Rural or small jurisdictions/older properties/depressed market areas	5.0 to 20.0
Income-producing properties (commercial, industrial, apartments,)	Very large jurisdictions/densely populated/newer properties/active markets	5.0 to 15.0
	Large to mid-sized jurisdictions/older & newer properties/less active markets	5.0 to 20.0
	Rural or small jurisdictions/older properties/depressed market areas	5.0 to 25.0
Residential vacant land	Very large jurisdictions/rapid development/active markets	5.0 to 15.0
	Large to mid-sized jurisdictions/slower development/less active markets	5.0 to 20.0
	Rural or small jurisdictions/little development/depressed markets	5.0 to 25.0
Other (non-agricultural) vacant land	Very large jurisdictions/rapid development/active markets	5.0 to 20.0
	Large to mid-sized jurisdictions/slower development/less active markets	5.0 to 25.0
	Rural or small jurisdictions/little development/depressed markets	5.0 to 30.0

These types of property are provided for general guidance only and may not represent jurisdictional requirements.

**The COD performance recommendations are based upon representative and adequate sample sizes, with outliers trimmed and a 95% level of confidence.*

**Appraisal level recommendation for each type of property shown should be between 0.90 and 1.10.*

**PRD's for each type of property should be between 0.98 and 1.03 to demonstrate vertical equity. However, PRD standards are not absolute and may be less meaningful when samples are small or when wide variation in prices exist. In such cases, statistical tests of vertical equity hypotheses should be substituted.*

**CODs lower than 5.0 may indicate sales chasing or non-representative samples.*

Source: Standard on Ratio Studies; International Association of Assessing Officers; Kansas City, Mo; April 2013; p 34.

Ratio studies may be performed for various reasons, including assessment accuracy and equity studies, to judge the need for and management of a reassessment, to identify problems with assessment procedures, to assist in market analysis, and to adjust assessed values. Many ratio study design issues must be considered depending on the purpose of the ratio study.

This study considers unadjusted sales price data during calendar year 2017 before the valuation date of January 1, 2018, that is the valuation date for the FY 2019 assessments. Generally, only sales that are verified as arms-length transactions are included in the study. Sales between related parties, to or from financial institutions or government agencies, or sales with extreme ratios (which indicate abnormal transactions) are not used in this study. An attempt was made to contact the property owner and physically inspect all sales. Where property owners were not at home or failed to respond to the “Sales Verification Questionnaire” mailed to them, an exterior inspection was performed. Thus, some of these transactions may have had conditions that could have warranted their exclusion from the study; but the transactions were included notwithstanding. Generally, RPTA’s ratio performance is good and conforms to IAAO standards.

In circumstances where property values are rapidly changing, ratio statistics will be adversely affected. Where real estate prices have been increasing (decreasing), ratio statistics will indicate a lower (higher) assessed value/sale price ratio. However, one should review the average deviation, coefficient of dispersion, and standard deviation to ensure that assessments are uniform.

COMPARISON OF RPTA’S VALUES TO SALE PRICES

Quality is the degree of excellence of a product or service. Also, quality is the extent to which a product measures up to certain standards. In this case, a measure of quality is the ratio study measuring whether the RPTA appraiser assessed properties uniformly and at estimated market value. Assuming the appraiser applied the mass appraisal model uniformly to all properties, this ratio study should show uniformity of assessment. The ratio study is a cross-check by the RPTA management to ensure quality of the mass appraisal. The ratio study was conducted on 7,579 sales of improved residential property and 260 sales of improved commercial property from January 1, 2017 to December 31, 2017, and it compares such sales to the administration’s valuations on the tax roll for FY 2019.

Table 3 summarizes the FY 2019 Real Property Assessment/Sale Ratio by neighborhood within the District of Columbia for residential properties. Table 4 displays similar information for commercial properties. Table 5 illustrates the frequency of assessment sale ratios, in the form of a histogram, for residential properties; the sales used in this study were calendar year 2017 real estate sales. Table 6 provides a summary of the compliance with standards, by property type, for the FY 2019 assessment program.

The histogram in Table 5 graphically represents the frequency distribution of individual residential ratios in the study. The general shape of the graph helps to illustrate the amount of dispersion existing in the data. A tall, narrow shape usually indicates less dispersion from the measure of central tendency, whereas a more flat and broad shape illustrates more dispersion and less desirable uniformity. The histogram of RPTA’s results illustrates both good central tendency and reasonable dispersion. The measures of central tendency indicate that properties, on average, have been valued for FY 2019 at approximately 97% of their respective sale prices and that on average all other properties have very similar ratios as indicated by the 7% coefficient of dispersion.

The analysis from Table 6 and the following descriptive statistics indicate that values determined by appraisers for the most recent valuation attained a uniform and appropriate level of value. Table 6 shows that of the fifty-six residential neighborhoods that were valued for FY 2019, forty-nine had a sufficient number of sales to be statistically relevant. All forty-nine residential neighborhoods met all applicable IAAO standards for assessment performance. In the case of commercial property, more weight is given to the income approach to valuation; additionally, there are fewer sales thereby impeding a more thorough investigation.

The summary data presented in Table 7 indicate that District-wide, for the category of all property types, the sales ratio statistics are in full compliance with IAAO's standards.

TABLE 3**FY 2019*****Residential Real Property Assessment Ratio by Neighborhood***

This table shows the real property assessment ratio data for residential properties. The ratios concern arms-length sales of properties. The sales used were sold between January 1, 2017 and December 31, 2017, and such sales are compared with RPTA's FY 2019 reassessment effective January 1, 2018. In neighborhoods with fewer than 20 sales, the statistics may not represent actual market conditions due to the small sample size.

Type of Property: Residential

Number	Neighborhood Name	Number of Sales	Average Sale Price	Median Sale Price	Median Ratio	Mean Ratio	Weighted Mean Ratio	Coefficient of Dispersion	Price-Related Differential
1	AMERICAN UNIVERSITY	112	1,021,844	989,000	98.0	96.9	96.1	5	1.01
2	ANACOSTIA	76	369,409	377,450	97.0	95.2	94.6	9	1.01
3	BARRY FARMS	18	299,430	302,500	98.9	96.1	97.2	11	0.99
4	BERKELEY	37	2,062,824	1,660,000	98.4	99.3	99.2	5	1.00
5	BRENTWOOD	42	405,941	367,000	96.2	98.2	96.8	9	1.01
6	BRIGHTWOOD	158	559,248	550,000	99.1	97.0	97.5	5	1.00
7	BROOKLAND	302	580,401	585,000	97.5	97.6	97.2	7	1.00
8	BURLEITH	31	1,256,378	1,250,000	98.5	96.8	96.5	5	1.00
9	CAPITOL HILL	136	1,027,112	1,015,318	96.8	96.6	95.4	6	1.01
10	CENTRAL	331	771,667	549,000	99.3	98.7	97.1	5	1.02
11	CHEVY CHASE	207	1,000,845	967,000	98.9	99.4	99.6	5	1.00
12	CHILLUM	26	612,530	602,350	99.2	98.8	98.8	5	1.00
13	CLEVELAND PARK	154	661,908	427,000	98.1	98.5	98.8	5	1.00
14	COLONIAL VILLAGE	16	1,044,250	925,000	99.6	99.2	99.0	3	1.00
15	COLUMBIA HEIGHTS	477	617,623	615,000	98.2	97.7	97.7	6	1.00
16	CONGRESS HEIGHTS	163	329,726	335,000	98.8	97.0	96.2	9	1.01
17	CRESTWOOD	26	1,116,705	1,008,000	95.1	96.8	94.7	10	1.02
18	DEANWOOD	219	328,921	325,000	97.2	96.2	96.0	9	1.00
19	ECKINGTON	148	648,034	634,000	96.2	96.3	96.5	6	1.00
20	FOGGY BOTTOM	56	397,613	290,000	99.1	98.3	98.2	5	1.00
21	FOREST HILLS	68	726,707	403,000	97.8	97.7	98.8	7	0.99
22	FORT DUPONT PARK	96	337,825	336,000	97.0	95.8	95.2	8	1.01
23	FOXHALL	12	1,030,046	934,500	96.7	96.2	96.0	6	1.00
24	GARFIELD	60	1,208,362	657,600	96.0	97.2	96.2	6	1.01
25	GEORGETOWN	209	1,559,139	1,290,000	98.3	97.5	95.5	5	1.02
26	GLOVER PARK	74	668,509	607,500	96.2	97.1	96.5	5	1.01

Number	Neighborhood Name	Number of Sales	Average Sale Price	Median Sale Price	Median Ratio	Mean Ratio	Weighted Mean Ratio	Coefficient of Dispersion	Price-Related Differential
27	HAWTHORNE	7	909,500	909,000	98.4	98.6	98.5	2	1.00
28	HILLCREST	94	362,447	399,950	97.9	98.1	96.6	11	1.02
29	KALORAMA	171	942,931	540,000	98.2	99.3	97.5	5	1.02
30	KENT	44	1,850,458	1,405,000	95.9	95.6	92.9	9	1.03
31	LEDROIT PARK	111	864,715	830,000	98.5	97.5	96.8	5	1.01
32	LILY PONDS	71	358,221	372,500	97.9	96.3	96.7	6	1.00
33	MARSHALL HEIGHTS	63	315,344	315,000	93.4	95.2	94.6	8	1.01
34	MASS. AVE. HEIGHTS	8	3,664,875	1,862,000	98.1	97.2	97.0	4	1.00
35	MICHIGAN PARK	31	611,868	550,000	98.5	97.1	95.3	8	1.02
36	MOUNT PLEASANT	220	699,425	599,900	98.5	97.9	97.4	6	1.01
37	N. CLEVELAND PARK	33	1,463,010	1,155,000	95.7	95.7	96.0	4	1.00
38	OBSERVATORY CIRCLE	55	642,081	500,000	98.8	98.5	97.9	5	1.01
39	OLD CITY #1	898	716,968	679,450	96.6	96.4	96.1	5	1.00
40	OLD CITY #2	1039	716,185	590,000	97.1	96.9	96.1	6	1.01
41	PALISADES	56	1,058,028	915,000	98.8	99.6	98.5	7	1.01
42	PETWORTH	318	612,606	630,000	95.0	92.7	91.2	11	1.02
43	RANDLE HEIGHTS	141	342,570	327,000	97.7	96.4	95.9	9	1.01
44	NOMA	0	0	0	0.0	0.0	0.0	0	0.00
46	SW WATERFRONT	192	631,294	414,900	95.0	96.4	94.8	7	1.02
47	RIGGS PARK	92	484,841	486,250	97.0	95.2	95.1	6	1.00
48	SHEPHERD PARK	20	876,503	831,125	99.9	97.6	96.3	4	1.01
49	16TH STREET HEIGHTS	109	667,562	690,000	95.9	96.1	95.8	6	1.00
50	SPRING VALLEY	46	1,822,662	1,650,000	99.5	99.8	99.2	5	1.01
51	TAKOMA PARK	27	599,631	585,000	99.2	97.4	97.2	6	1.00
52	TRINIDAD	199	507,872	520,000	97.0	96.6	95.0	9	1.02
53	WAKEFIELD	25	743,984	470,000	99.3	99.7	98.2	6	1.02
54	WESLEY HEIGHTS	68	851,553	625,000	97.2	96.8	95.7	8	1.01
55	WOODLEY	4	1,884,500	1,931,500	94.1	95.2	94.7	7	1.01
56	WOODRIDGE	106	585,280	572,500	97.8	97.6	97.5	6	1.00
66	FORT LINCOLN	77	557,632	549,900	98.8	97.9	98.2	5	1.00

TABLE 4**FY 2019****Commercial Real Property Assessment Ratio by Neighborhood**

This table shows the real property assessment ratio data for commercial properties. The ratios concern arms-length sales of properties. The sales used were sold between January 1, 2017 and December 31, 2017, and such sales are compared with RPTA's FY 2019 reassessment effective January 1, 2018. In neighborhoods with fewer than 20 sales, the statistics may not represent actual market conditions due to the small sample size.

Type of Property: Commercial

Number	Neighborhood Name	Number of Sales	Average Sale Price	Median Sale Price	Median Ratio	Mean Ratio	Weighted Mean Ratio	Coefficient of Dispersion	Price-Related Differential
2	ANACOSTIA	1	525,000	525,000	65.2	65.2	65.2	0	1.00
3	BARRY FARMS	1	1,200,000	1,200,000	84.5	84.5	84.5	0	1.00
5	BRENTWOOD	7	4,488,139	4,396,800	82.8	83.5	85.9	12	0.97
6	BRIGHTWOOD	4	3,970,000	640,000	93.7	94.6	92.4	3	1.02
7	BROOKLAND	7	2,213,978	1,258,225	87.9	88.2	90.4	7	0.97
9	CAPITOL HILL	7	3,883,571	3,350,000	87.4	91.4	90.0	8	1.01
10	CENTRAL	29	92,555,522	61,750,000	90.2	89.7	92.9	12	0.97
11	CHEVY CHASE	3	9,868,333	9,200,000	84.6	94.0	84.4	14	1.11
12	CHILLUM	6	1,379,693	970,823	98.0	93.1	92.6	9	1.01
15	COLUMBIA HEIGHTS	11	1,664,545	1,300,000	81.1	74.9	75.1	15	1.00
16	CONGRESS HEIGHTS	14	2,143,929	662,500	88.8	90.1	91.2	10	0.99
18	DEANWOOD	15	1,864,077	875,000	89.5	89.6	88.5	14	1.01
19	ECKINGTON	7	5,182,143	5,050,000	95.9	95.1	93.5	9	1.02
20	FOGGY BOTTOM	5	67,267,800	85,607,500	100.0	98.0	94.0	10	1.04
22	FORT DUPONT PARK	5	916,795	858,975	94.3	95.8	99.7	6	0.96
24	GARFIELD	2	11,225,000	11,225,000	80.4	80.4	94.9	23	0.85
25	GEORGETOWN	6	10,894,271	1,542,813	86.0	92.1	97.2	17	0.95
26	GLOVER PARK	2	1,665,000	1,665,000	84.6	84.6	77.7	20	1.09
28	HILLCREST	9	920,778	783,000	96.5	95.8	94.2	5	1.02
29	KALORAMA	8	5,005,011	2,820,045	98.6	96.7	97.8	8	0.99
33	MARSHALL HEIGHTS	3	5,625,000	4,500,000	100.9	90.0	94.5	15	0.95
36	MOUNT PLEASANT	7	2,953,571	1,600,000	92.2	99.3	109.5	11	0.91
37	N. CLEVELAND PARK	1	1,100,000	1,100,000	107.4	107.0	107.4	0	1.00

Number	Neighborhood Name	Number of Sales	Average Sale Price	Median Sale Price	Median Ratio	Mean Ratio	Weighted Mean Ratio	Coefficient of Dispersion	Price-Related Differential
38	OBSERVATORY CIRCLE	2	1,025,000	1,025,000	93.9	93.9	94.7	4	0.99
39	OLD CITY #1	20	7,238,775	1,837,500	91.1	91.5	89.0	11	1.03
40	OLD CITY #2	29	6,564,961	2,260,000	91.7	85.7	84.5	17	1.01
41	PALISADES	3	1,800,000	2,000,000	89.6	80.8	78.1	13	1.03
42	PETWORTH	15	1,234,151	875,000	89.4	87.4	84.8	11	1.03
43	RANDLE HEIGHTS	3	2,481,643	1,163,929	86.6	85.2	85.9	2	0.99
44	NOMA	6	51,056,667	27,275,000	98.6	98.8	93.8	6	1.05
46	SW WATERFRONT	6	113,606,900	78,470,500	100.1	99.4	100.8	4	0.99
49	16TH STREET HEIGHTS	3	1,425,000	1,325,000	93.1	78.1	78.9	18	0.99
51	TAKOMA PARK	1	1,900,000	1,900,000	90.4	90.4	90.4	0	1.00
52	TRINIDAD	3	557,833	484,500	82.7	79.4	73.9	12	1.07
53	WAKEFIELD	1	1,350,000	1,350,000	57.2	57.2	57.2	0	1.00
56	WOODRIDGE	8	1,746,908	1,467,455	99.4	93.3	92.6	12	1.01

TABLE 5

FY 2019 HISTOGRAM OF RESIDENTIAL SALES RATIOS

GRAPH OF SALES RATIOS

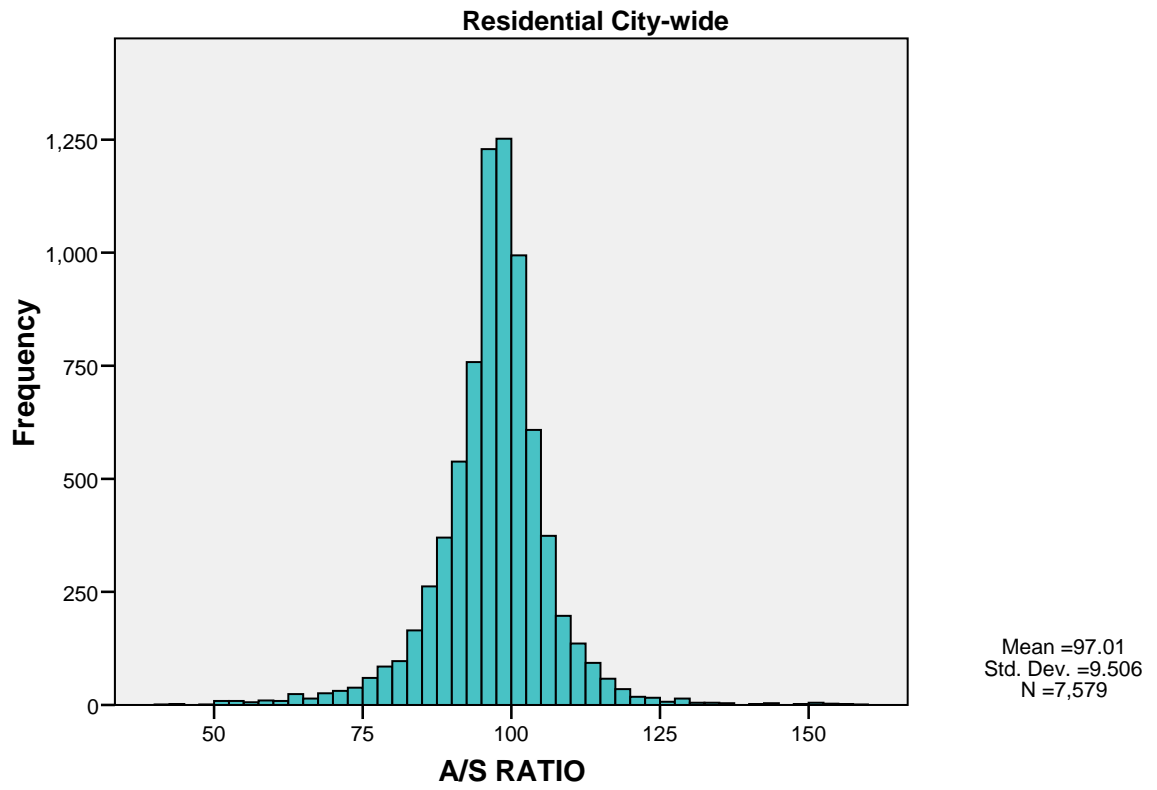


TABLE 6**Compliance with IAAO Ratio Study Performance Standards for FY 2019 Assessments**

The IAAO sets advisory standards for assessment statistics. These standards are depicted in Table 2. In this table, a “+” indicates compliance with the standards.

FY 2019	Residential Median Ratio	Residential Coefficient of Dispersion	Residential Price-Related Differential	Commercial Median Ratio
AMERICAN UNIVERSITY	+	+	+	∅
ANACOSTIA	+	+	+	∅
BARRY FARMS	∅	∅	∅	∅
BERKELEY	+	+	+	∅
BRENTWOOD	+	+	+	∅
BRIGHTWOOD	+	+	+	∅
BROOKLAND	+	+	+	∅
BURLEITH	+	+	+	∅
CAPITOL HILL	+	+	+	∅
CENTRAL	+	+	+	+
CHEVY CHASE	+	+	+	∅
CHILLUM	+	+	+	∅
CLEVELAND PARK	+	+	+	∅
COLONIAL VILLAGE	∅	∅	∅	∅
COLUMBIA HEIGHTS	+	+	+	∅
CONGRESS HEIGHTS	+	+	+	∅
CRESTWOOD	+	+	+	∅
DEANWOOD	+	+	+	∅
ECKINGTON	+	+	+	∅
FOGGY BOTTOM	+	+	+	∅
FOREST HILLS	+	+	+	∅
FORT DUPONT PARK	+	+	+	∅
FOXHALL	∅	∅	∅	∅
GARFIELD	+	+	+	∅
GEORGETOWN	+	+	+	∅
GLOVER PARK	+	+	+	∅
HAWTHORNE	∅	∅	∅	∅
HILLCREST	+	+	+	∅

FY 2019	Residential Median Ratio	Residential Coefficient of Dispersion	Residential Price-Related Differential	Commercial Median Ratio
KALORAMA	+	+	+	Ø
KENT	+	+	+	Ø
LEDROIT PARK	+	+	+	Ø
LILY PONDS	+	+	+	Ø
MARSHALL HEIGHTS	+	+	+	Ø
MASS. AVE. HEIGHTS	Ø	Ø	Ø	Ø
MICHIGAN PARK	+	+	+	Ø
MOUNT PLEASANT	+	+	+	Ø
N. CLEVELAND PARK	+	+	+	Ø
OBSERVATORY CIRCLE	+	+	+	Ø
OLD CITY #1	+	+	+	+
OLD CITY #2	+	+	+	+
PALISADES	+	+	+	Ø
PETWORTH	+	+	+	Ø
RANDLE HEIGHTS	+	+	+	Ø
NOMA	Ø	Ø	Ø	Ø
SW WATERFRONT	+	+	+	Ø
RIGGS PARK	+	+	+	Ø
SHEPHERD PARK	+	+	+	Ø
16TH STREET HEIGHTS	+	+	+	Ø
SPRING VALLEY	+	+	+	Ø
TAKOMA PARK	+	+	+	Ø
TRINIDAD	+	+	+	Ø
WAKEFIELD	+	+	+	Ø
WESLEY HEIGHTS	+	+	+	Ø
WOODLEY	Ø	Ø	Ø	Ø
WOODRIDGE	+	+	+	Ø
FORT LINCOLN	+	+	+	Ø

+ = Meets IAAO Standard

× = Does not meet IAAO Standard

Ø = Insufficient data

TABLE 7

SUMMARY OF SALES RATIO STATISTICS FY 2019

SALES RATIO BY PROPERTY: CITY WIDE								
PROPERTY TYPE	SALES	AVG PRICE	MED PRICE	MEDIAN	MEAN	WEIGHTED	COD	PRD
All	7,839	1,309,104	596,000	97.5	96.8	95.1	7	1.02
Residential	7,579	717,382	580,000	97.6	97.0	96.4	7	1.01
Commercial	260	18,557,795	1,762,500	91.7	89.7	93.5	12	0.96