DEPARTMENT OF
ASSESSMENTS & TAXATION

2016 RatioReport

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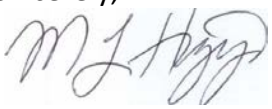
The Honorable Larry Hogan
And
The General Assembly of Maryland

As required by Section 2-202 of the Tax-Property Article of the Annotated Code of Maryland, I am pleased to submit the Department of Assessments and Taxation's 2016 Assessment Ratio Report. This report measures the quality of real property assessments in each of Maryland's 24 jurisdictions.

The Department has adopted the national standards for measuring property assessment quality as outlined by the International Association of Assessing Officers. Those national standards, as well as our compliance with those standards, are discussed in the body of this report. Statewide, the Department has met the IAAO standard for coefficient of dispersion indicating an overall uniformity of assessments.

Our entire team is committed to provide the customers we serve the highest level of courteous, prompt and efficient service. I hope the information contained in this Report is of value to you and your constituents. As always, we welcome and appreciate your feedback and comments as to how the Department can enhance the level of service provided to our customers.

Sincerely,



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2016 ASSESSMENT RATIO REPORT

SECTION I – OVERVIEW

The Department of Assessments and Taxation appraises real property for the purposes of property taxation. Properties are valued using the three approaches generally recognized by the appraisal profession: cost, sales comparison, and (when applicable) income.

Residential property characteristics include size, type and condition of structure, type and quality of construction, and any new improvements. Commercial properties are reviewed for size, type and condition of structure, type and quality of construction, any new improvements, current use of the property, types of tenants, and vacancy.

This year, the Department valued more than 688,440 properties, which required the use of mass appraisal techniques. While a fee appraiser is concerned with valuing one property at a time, an assessor is valuing whole neighborhoods. To accomplish this, special mass appraisal procedures are used. The assessor will review the data and calculate replacement costs for improvements much like a fee appraiser. The assessor will then review the sales from the area. In Maryland, the county's local assessment office receives a copy of all deeds and property sales prices when the deed transferring the property is recorded with the clerk of the court. In Baltimore City, the Department of Public Works provides that data to the Department. In the assessor's review and analysis of the sales, the assessor will develop land rates, depreciation tables, and sales analysis reports. After completing the analysis, the assessor applies the factors uniformly throughout the neighborhood to value all comparable properties. Assessors analyze rental rates, vacancy and collection loss, expense ratios, and capitalization rates for comparable income producing properties.

The Department's work is reviewed by legislative auditors and is often scrutinized by individual property owners. We are continually striving for higher quality in assessment uniformity. Our quality control program begins with the individual assessor and their immediate supervisor. As work is completed by an assessor, their supervisor reviews the analysis, makes recommendations, and approves the work. Their supervisor also makes a random check of the assessor's work using procedural and data editing. Following the completion of the revaluation, various computer edits are made to assure good valuation quality.

One measurement of quality is the assessed value/sale price ratio, which measures how closely the Department's values compare to the actual sales prices. Although the average assessed value/sale price ratio indicates a typical level of value, the marketplace is not perfect and there will always be properties that sell for more or less than can be anticipated. This may be due to factors such as buyers who are willing to pay extra for a unique property or declining values in a buyer's market.

In mass appraisal and assessment ratio studies, we are not only concerned with average assessed value/sale price levels (ratios) but also with the degree of spread (variation) from the typical ratio. The measurement of variation is called the coefficient of dispersion (COD). The lower the COD, the more uniform the assessment level.

In the balance of this report, Section II will give a more detailed explanation of the statistical terms as applied to assessment administration and quality control. Section III explains the International Association of Assessing Officers' Standard of Performance for ratio studies. Section IV gives an overview of statewide appraisal quality for the most recent valuation of triennial Group 1, performed for January 1, 2016.

SECTION II – RATIO STATISTICS

The purpose of this ratio study is to test the quality of the assessment product, which is examined from both an assessment level and assessment uniformity standpoint. The assessment level examines the degree to which the assessments are performed based upon the statutory requirement of full market value. Assessment uniformity measures the degree to which different properties are assessed at equal percentages of their market values. Based on our most recent valuation, the Department performs many ratio studies examining neighborhoods, types of structures, age of structures, etc.

Several measures of central tendency are used as performance gauges and are affected differently by outliers. A ratio of assessed value to sales price is calculated for each property, with the average ratio being the total of all ratios divided by the number of sales. The average (mean) ratio has a natural upward bias, indicating a higher level of assessment than has actually occurred. The median is the midpoint of any data listed from lowest to highest, and the median ratio is the point where half the ratios fall above and half the ratios fall below. The median ratio counts each ratio equally. It is less biased by extreme ratios (outliers) or by individual property values. The weighted ratio is the total of all assessed values divided by the total of all sales prices. Since the weighted ratio counts each dollar equally, it is swayed by higher priced properties.

In addition to the general level of assessments, The Department is also concerned with the relative spread or variation that individual ratios fall from the typical ratio. This variability is measured in two ways: coefficient of dispersion and coefficient of variation. These statistics measure horizontal inequities, or the dispersion of ratios regardless of the value of the individual properties. The coefficient of dispersion is calculated by dividing the average absolute deviation by the median ratio. The average absolute deviation is calculated by subtracting the median ratio from each ratio, adding all the results while ignoring positive and negative signs, and dividing that result by the number of ratios. Acceptable coefficients of dispersion depend on property type but should typically be 20% or less. Coefficient of variation is calculated by dividing the standard deviation by the mean or average ratio and multiplying by 100. The variance is calculated by subtracting the mean from each ratio, squaring the differences, summing the squared differences, and dividing by the total number of ratios less one. The standard deviation is calculated by taking the square root of the variance. The coefficient of dispersion is the preferable measure of variance unless a sample is normally distributed. If there is a normal distribution, the coefficient of variation is the preferable measure of variance.

Another statistical measure used to gauge assessment uniformity is the Price Related Differential (PRD). The PRD tests to see if higher or lower valued properties are assessed at the same level, and is calculated by dividing the average ratio by the weighted ratio. This statistic measures vertical inequities. When low-value properties are valued at a higher percentage of their market

value, the property taxes levied against these assessments are regressive. Conversely, if high-value properties are valued at a higher percentage of their market value, property taxes levied against these assessments are progressive. Typically, PRDs have an upward bias because higher priced properties are more unique. PRDs should range between 0.98 and 1.03, except for very small samples. For example, a PRD of 1.03 indicates undervaluation of high priced properties, while a PRD of .98 shows an under valuation of low priced properties.

Other descriptive statistical methods that may be used to analyze the assessment product are histograms, frequency distributions, and scatter diagrams. Due to the scope of this report, we have not examined them here. For further information on statistics relating to assessments, please refer to the International Association of Assessing Officers' publication "Improving Real Property Assessment".

Table I is the Fiscal Year 2016 Real Property Base/Ratio by Subdivision with assessment ratios expressed relative to full value. Table II is a history of weighted assessment ratios converted to full value, which allows for comparison between years by adjusting for statutory changes in the assessment level. Table III displays examples of the statistical calculations used in this report.

Tables IV and V show the residential and commercial 2016 Ratio Study data by jurisdiction at assessed full market value level for the area most recently assessed. Following the ratio study is Table VI of the report detailing issues of assessment and appraisal quality that are summarized in Section IV.

SECTION III – RATIO STUDY STANDARDS VALUES TO SALE PRICES

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

IAAO's Standard on Ratio Studies was first published in September 1980 and was revised in April 2013. The Standard is advisory in nature, and provides guidance to those performing ratio studies in the mass appraisal field regarding the design, statistics, performance measures, and more. The Maryland Department of Assessments and Taxation uses the Standard's fundamental ratio statistical measures and has adopted IAAO's Assessment Ratio Performance Standard as the criteria to judge the performance of Maryland revaluations.

The IAAO Ratio Performance Standards are:

Ratio Study Uniformity Standards Indicating Acceptable General Quality*

General Property Class	Jurisdiction Size /Profile /Market Activity	Max COD
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.*

**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; pg 34.

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

This study considers unadjusted sales price data six months prior to and six months after the date of finality, which is January 1, the date of valuation. This is the date for which assessments have become effective so that an unbiased estimate of assessment performance can be obtained. Sales that are arms-length transactions between willing and informed buyers and sellers are used in this study. Maryland's ratio performance conforms to the IAAO Standard.

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

As a proxy for time adjustments, this report uses sales from six months before the date of finality to six months after the date of finality. Under normal circumstances, with steadily changing

property values, these sales will balance. In unusual circumstances, when property values are rapidly changing, this will affect the ratio statistics.

On average, the residential values in this group increased by 9.5% and commercial property values showed an increase in 22 of the 24 subdivisions, with an overall average increase of 16.0 % statewide.

Property value changes varied by region in the state since the last triennial revaluation in January, 2013.

Statewide, the Department met the IAAO standard for coefficient of dispersion indicating an overall uniformity of assessments.

Commercial properties are generally less similar than residential properties. Many commercial properties are income producing and are valued using the income approach to value. Most commercial uses are cyclical in nature. Various segments of the commercial real estate market may be ascending in value as a class, while others may be declining in market popularity. Because of the uniqueness of commercial and industrial properties, measures of central tendency tend to vary more widely than with residential properties.

The number of commercial properties is small compared to the number of residential properties. In several jurisdictions, the number of commercial properties which have sold is so small that the statistical measures are prone to bias. Allegany, Calvert, Caroline, Dorchester, Garrett, Harford, Kent, St. Mary's, and Somerset Counties all had fewer than 10 arms-length commercial transfers for Group 1. In those jurisdictions, individual statistical measures would be unreliable due to sample size.

The number of commercial sales increased from 425 statewide in the 2015 Ratio Report to 441 statewide in the 2016 Ratio Report.

SECTION IV - STATEWIDE COMPARISON OF DEPARTMENT'S VALUES TO SALE PRICE

Quality is the degree of excellence of a product or service as determined by the extent to which they measure up to certain standards. One measure of quality is the ratio study that determines whether the assessor appraised properties uniformly at market value. The ratio study conducted in this report is based upon sales data occurring, for the most part, after the time period of sales used by the assessor in the group of properties being reassessed.

Assuming the assessor applied the mass appraisal model uniformly to all properties, this ratio study should show uniformity of assessment. This ratio study is a cross check by Department management to assure quality of the mass appraisal work product. The ratio statistics for each county in Table IV was conducted on 21,006 improved residential property sales from July 1, 2015 to June 30, 2016 and compares the Department's valuations to actual sales prices.

The frequency distribution and statistics in Table IV present a statewide ratio analysis of improved residential property sales from July 1, 2015 to June 30, 2016 by comparing the

Department's values to sales prices. The measures of central tendency indicate that properties are valued at approximately 93% of sale price and that on average all other properties have very similar ratios as indicated by the 9.0 Coefficient of Dispersion. Additionally, higher valued properties are assessed at similar levels as lower valued properties as indicated by a Price Related Differential statistic of 1.01. A price related differential of 1.00 indicates vertical uniformity across all strata of property values.

The analysis from Table IV and the following descriptive statistics indicates that values determined by assessors for the most recent triennial Group 1 valuation attained a uniform and appropriate level of value. At the time of valuation, the assessments were close to the sales price.

In summary, the data shows that properties throughout the State are assessed uniformly as required by law.

Table I
Fiscal Year 2016 Real Property Tax Base/Ratio by Jurisdiction

This table shows the taxable assessable base and ratios of real property used for different purposes. Ratios shown are median ratios of arms-length sales of properties in Group 1 that were sold between July 1, 2015 and June 30, 2016, compared with the Department's January 1, 2016 assessed value. In jurisdictions with fewer than 10 commercial sales, the statewide ratio is used (see Table V). A ratio of 100% is used for property not assessed on market value.

	Number of Properties	Residential		Commercial		Agricultural		Use Value		Total Base	Weighted Ratio
		Base	Ratio	Base	Ratio	Base	Ratio	Base	Ratio		
Allegany	38,504	2,650,991,784	94.4%	925,612,778	92.7%	131,116,329	94.4%	3,104,400	100.0%	3,710,825,291	94.0%
Anne Arundel	209,850	62,527,082,470	93.8%	18,719,102,199	100.5%	503,603,138	93.8%	20,966,400	100.0%	81,770,754,207	95.2%
Baltimore City	220,552	24,635,239,343	91.0%	17,549,892,872	94.0%	0	91.0%	0	100.0%	42,185,132,215	92.2%
Baltimore	283,445	57,393,273,080	94.6%	22,430,286,818	95.2%	1,034,693,070	94.6%	67,290,967	100.0%	80,925,543,935	94.8%
Calvert	42,062	10,208,314,657	92.6%	1,296,931,600	83.6%	268,052,668	92.6%	1,600	100.0%	11,773,300,525	91.5%
Caroline	15,994	2,082,310,228	93.9%	422,926,432	100.2%	363,918,639	93.9%	489,300	100.0%	2,869,644,599	94.8%
Carroll	65,297	16,165,188,204	93.2%	2,385,601,371	88.5%	943,345,694	93.2%	4,898,400	100.0%	19,499,033,669	92.6%
Cecil	46,005	7,473,269,237	92.7%	1,953,352,735	92.1%	507,534,006	92.7%	9,800	100.0%	9,934,165,778	92.6%
Charles	64,601	13,330,210,971	92.5%	3,091,100,382	95.9%	424,431,922	92.5%	16,969,134	100.0%	16,862,712,409	93.1%
Dorchester	22,090	2,331,580,503	93.9%	500,213,707	92.8%	283,296,669	93.9%	3,127,000	100.0%	3,118,217,879	93.7%
Frederick	94,025	22,269,185,838	92.0%	5,607,018,156	93.6%	1,294,352,883	92.0%	27,155,864	100.0%	29,197,712,741	92.3%
Garrett	28,563	3,837,544,939	92.1%	468,628,647	105.5%	231,359,869	92.1%	0	100.0%	4,537,533,455	93.3%
Harford	97,400	21,280,674,187	91.0%	5,378,988,885	92.0%	745,565,413	91.0%	0	100.0%	27,405,228,485	91.2%
Howard	103,466	37,425,487,454	92.8%	10,313,314,680	100.0%	428,664,630	92.8%	0	100.0%	48,167,466,764	94.2%
Kent	12,968	2,516,894,298	91.5%	391,667,097	92.8%	391,154,264	91.5%	3,974,200	100.0%	3,303,689,859	91.7%
Montgomery	329,117	137,857,709,922	93.6%	41,514,755,464	93.4%	639,078,362	93.6%	105,853,732	100.0%	180,117,397,480	93.6%
Prince George's	280,426	56,271,239,268	94.6%	24,813,693,015	93.7%	270,314,298	94.6%	27,488,400	100.0%	81,382,734,981	94.3%
Queen Anne's	25,246	6,787,508,604	98.0%	963,544,924	101.8%	751,219,469	98.0%	64,467	100.0%	8,502,337,464	98.4%
St. Mary's	47,980	10,393,044,005	93.2%	1,634,075,102	92.8%	617,827,406	93.2%	9,854,133	100.0%	12,654,800,646	93.2%
Somerset	15,954	1,112,318,473	94.5%	266,282,909	92.8%	146,327,475	94.5%	900,900	100.0%	1,525,829,757	94.2%
Talbot	20,693	7,330,699,962	97.4%	1,031,773,663	90.6%	966,666,601	97.4%	8,792,133	100.0%	9,337,932,359	96.6%
Washington	56,256	8,446,052,297	90.9%	3,644,925,394	99.8%	565,084,659	90.9%	8,323,900	100.0%	12,664,386,250	93.3%
Wicomico	45,055	4,354,281,917	91.4%	1,424,516,290	91.7%	282,963,332	91.4%	3,376,000	100.0%	6,065,137,539	91.5%
Worcester	65,130	12,454,033,261	92.9%	2,329,234,917	89.9%	275,591,072	92.9%	22,932,100	100.0%	15,081,791,350	92.5%
Statewide	**2,230,679**	**531,134,134,902**	**93.3%**	**169,057,440,037**	**92.8%**	**12,066,161,868**	**93.3%**	**335,572,830**	100.0%	**712,593,309,637**	**93.2%**

TABLE II

Assessment Levels

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Allegany	96.4	98.5	93.4	99.9	95.2	95.0	93.0	89.6	90.1	90.0	91.8	94.5%	94.2%	95.2%	94.0%
Anne Arundel	89.8	87.4	84.4	84.5	85.6	96.0	95.2	95.1	90.3	89.7	90.2	91.2%	90.7%	93.8%	95.2%
Baltimore City	94.3	94.9	95.0	74.3	85.2	92.0	94.7	91.6	91.4	91.3	95.8	94.8%	93.1%	91.0%	92.2%
Baltimore	91.3	92.7	86.5	88.5	83.5	94.0	94.6	94.8	91.5	93.6	93.0	87.6%	92.3%	96.8%	94.8%
Calvert	90.4	87.3	82.1	82.3	85.6	95.0	95.4	96.0	94.0	91.7	90.6	90.5%	91.1%	91.3%	91.5%
Caroline	92.2	88.3	87.3	81.7	88.9	95.0	95.3	92.8	95.7	97.2	98.1	94.4%	95.6%	95.4%	94.8%
Carroll	92.0	89.5	86.6	85.9	89.7	96.0	97.1	94.0	89.5	93.2	90.5	91.5%	92.9%	91.3%	92.6%
Cecil	92.0	91.8	88.9	86.0	91.0	94.0	94.9	94.9	91.6	87.2	91.2	94.8%	92.4%	93.2%	92.6%
Charles	92.0	88.6	88.9	87.1	88.0	94.0	96.4	93.4	92.1	92.2	92.2	91.9%	92.3%	94.5%	93.1%
Dorchester	89.1	89.3	85.4	67.0	79.3	91.0	96.9	90.2	95.3	91.2	90.8	98.1%	91.8%	93.1%	93.7%
Frederick	90.2	87.4	88.9	83.7	90.9	96.0	98.2	95.6	89.2	93.0	89.2	90.4%	92.1%	90.9%	92.3%
Garrett	93.7	83.8	91.6	88.6	91.8	95.0	92.7	91.0	89.9	98.1	90.6	90.2%	94.9%	94.7%	93.3%
Harford	89.1	88.2	85.0	85.5	85.0	93.0	96.1	92.8	91.6	91.2	94.2	92.8%	92.0%	91.7%	91.2%
Howard	92.2	90.1	88.2	89.8	92.5	97.0	96.5	93.1	88.2	89.6	91.3	89.8%	92.6%	91.3%	94.2%
Kent	92.0	92.6	87.3	86.0	83.9	94.0	95.2	91.0	90.8	94.8	98.5	96.9%	96.4%	91.4%	91.7%
Montgomery	88.2	91.0	93.3	93.2	95.5	98.0	96.4	95.4	88.4	92.9	92.9	91.6%	92.4%	96.6%	93.6%
Prince George's	91.0	90.5	83.8	83.0	85.1	91.0	98.2	96.4	95.3	92.8	92.9	90.7%	91.8%	93.7%	94.3%
Queen Anne's	93.8	90.5	86.8	88.7	87.9	96.0	96.4	91.1	90.6	93.6	92.2	95.2%	93.8%	96.4%	98.4%
St. Mary's	93.1	89.5	83.8	80.4	88.2	95.0	97.9	96.6	93.3	94.5	94.5	95.3%	94.1%	92.7%	93.2%
Somerset	94.5	94.5	85.2	85.5	86.2	86.0	92.5	89.3	85.0	91.5	87.9	96.1%	93.7%	93.3%	94.2%
Talbot	84.4	87.4	89.6	83.3	88.7	96.0	98.0	93.9	93.8	97.7	96.8	93.8%	94.5%	92.8%	96.6%
Washington	92.6	89.1	91.1	87.4	90.0	97.0	97.2	91.8	92.9	95.4	90.7	90.8%	93.7%	93.1%	93.3%
Wicomico	91.8	89.8	90.6	84.0	82.9	89.0	90.3	88.9	89.1	90.6	89.4	91.0%	90.4%	87.8%	91.5%
Worcester	89.4	76.8	86.8	83.2	89.2	97.0	93.9	93.9	92.2	89.5	91.4	89.7%	91.5%	90.5%	92.5%
Statewide	**90.5**	**90.0**	**88.2**	**86.0**	**89.7**	**96.0**	**95.7**	**94.0**	**91.0**	**92.0**	**91.7**	**91.3%**	**92.3%**	**93.9%**	**93.2%**

TABLE III
Illustrated Ratio Study Statistics

(1.) Property Number	(2.) Sale Price	(3.) Assessed Value	(4.) Ratio A/S %	(5.) Absolute Deviation from Median
1	28,000	22,400	80%	20%
2	22,000	19,250	88%	12%
3	63,500	55,575	88%	12%
4	55,900	51,700	92%	7%
5	20,000	19,000	95%	5%
6	21,000	20,475	98%	2%
7	80,000	80,000	100%	0%
8	40,000	40,000	100%	0%
9	33,000	33,300	101%	1%
10	45,000	46,125	103%	3%
11	24,000	25,200	105%	5%
12	39,000	41,925	108%	8%
13	37,000	41,625	113%	13%
14	40,300	45,800	114%	14%
15	51,000	59,925	118%	18%
TOTAL	599,700	602,300	1500%	120%

Average Ratio = Total of Ratios (4.) ÷ Number of Sales (1.)
1500% ÷ 15 = 100%

Weighted Ratio = Total of Assessed Values (3.) ÷ Total of Sale Prices (2.)
602,300 ÷ 599,700 = 100%

Average Deviation = Total Deviations (5.) ÷ Number of Sales (1.)
120% ÷ 15 = 8%

Median Ratio = Middle Value of Data Array = 100%
(i.e. property #8)

Coefficient of Dispersion = Average Deviation (5.) ÷ Median Ratio (4.)
8% ÷ 100% = 7.98

Price Related Differential = Average Ratio (4.) ÷ Weighted Ratio
100% ÷ 100% = 1.00

Table IV
2016 Residential Ratio Study

This table shows arms-length sales of improved residential and condominium properties in Group 3 from July 1, 2015 through June 30, 2016. Ratios compare the Department's January 1, 2016 value to the actual sale price.

	Number of Sales	Average Ratio	Median Ratio	Weighted Ratio	Average Deviation	Coefficient of Dispersion	Price Related Differential	Standard Deviation	Coefficient of Variation	Median Sale Price
Allegany	106	94.4%	95.3%	94.8%	4.4%	0.05	1.00	0.06	6.25	$142,250
Anne Arundel	2,209	93.8%	93.4%	92.7%	8.1%	0.09	1.01	0.11	11.52	$369,900
Baltimore City	1,357	91.0%	92.7%	89.3%	10.8%	0.12	1.02	0.14	15.90	$169,500
Baltimore	2,739	94.6%	93.0%	91.6%	12.8%	0.14	1.03	0.19	19.62	$230,000
Calvert	288	92.6%	92.7%	92.6%	5.7%	0.06	1.00	0.08	8.16	$389,500
Caroline	87	93.9%	93.4%	93.6%	9.1%	0.10	1.00	0.12	12.89	$189,000
Carroll	952	93.2%	93.8%	92.9%	6.5%	0.07	1.00	0.09	9.37	$355,400
Cecil	289	92.7%	94.3%	92.5%	5.8%	0.06	1.00	0.08	8.77	$207,000
Charles	912	92.5%	93.0%	92.7%	5.4%	0.06	1.00	0.07	7.88	$292,145
Dorchester	81	93.9%	94.4%	93.3%	9.3%	0.10	1.01	0.13	13.40	$153,000
Frederick	1,448	92.0%	92.9%	92.0%	6.5%	0.07	1.00	0.09	9.79	$369,025
Garrett	54	92.1%	92.8%	89.3%	11.2%	0.12	1.03	0.15	16.50	$129,950
Harford	622	91.0%	92.2%	90.5%	7.9%	0.09	1.01	0.10	11.40	$297,000
Howard	1,399	92.8%	93.4%	92.6%	6.0%	0.06	1.00	0.08	8.65	$473,425
Kent	41	91.5%	93.8%	92.2%	6.6%	0.07	0.99	0.09	10.29	$218,500
Montgomery	4,234	93.6%	93.6%	92.8%	8.2%	0.09	1.01	0.12	12.74	$489,000
Prince George's	2,051	94.6%	92.9%	93.3%	10.6%	0.11	1.01	0.15	16.05	$294,990
Queen Anne's	252	98.0%	98.2%	98.0%	6.0%	0.06	1.00	0.09	9.52	$355,028
St. Mary's	231	93.2%	94.3%	92.8%	5.6%	0.06	1.00	0.08	8.52	$290,000
Somerset	15	94.5%	97.8%	90.8%	11.2%	0.11	1.04	0.17	18.24	$120,000
Talbot	302	97.4%	95.6%	96.9%	8.7%	0.09	1.00	0.13	13.65	$280,000
Washington	555	90.9%	92.6%	90.9%	7.8%	0.08	1.00	0.10	11.31	$239,900
Wicomico	301	91.4%	93.8%	91.2%	7.9%	0.08	1.00	0.11	11.91	$145,000
Worcester	481	92.9%	93.9%	92.6%	7.5%	0.08	1.00	0.11	11.35	$225,000
Statewide	**21,006**	**93.3%**	**93.4%**	**92.5%**	**8.6%**	**0.09**	**1.01**	**0.13**	**13.44**	**$319,028**

TABLE IV-B
Statewide Residential Ratio Study Frequency Statistics

Average Ratio

Total of Ratios / Number of Sales	=	19606.35 / 21,006	=	93.3%

Weighted Ratio

Total Assessed Values / Total Sales Prices	=	7,289,479,700 / 7,878,177,181	=	92.5%

Average Deviation

Total Deviations / Number of Sales	=	1,806 / 21,006	=	8.6%

Coefficient of Dispersion

Average Absolute Deviation / Median Ratio / 100	=	0.0860 / 1%	=	920.80

Price Related Differential

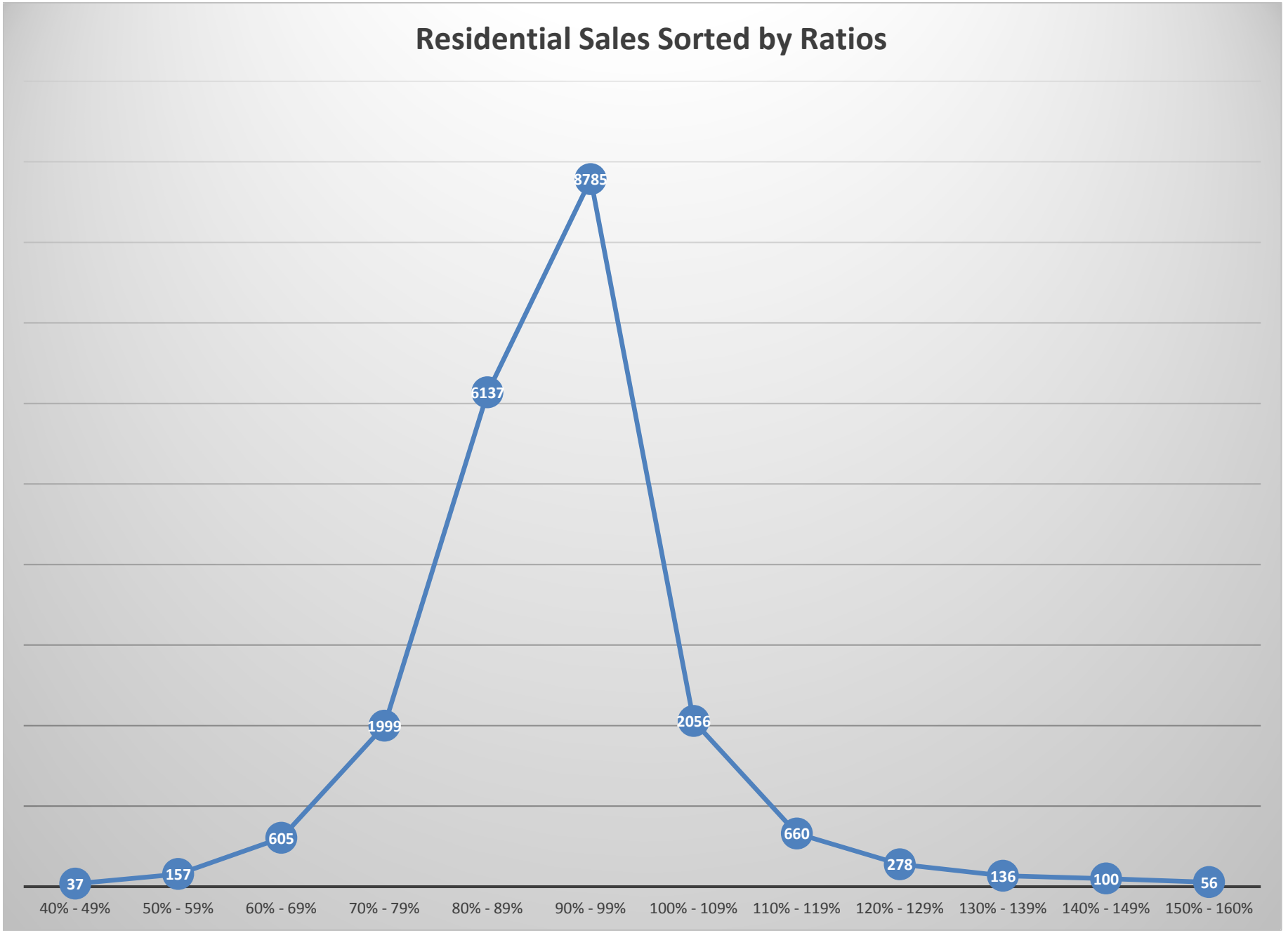
Average Ratio / Weighted Ratio	=	93.34% / 92.53%	=	1.01

Table V
Commercial Ratio Study 2016

The table below shows statistics on arms-length sales between July 1, 2015 and June 30, 2016 of commercial property in assessment Group 3. Ratios compare the Department's January 1, 2016, value to the actual sale price.

Ratio statistics are shown for all jurisdictions, even where the number of sales is so small that there is not a sufficient sample to provide accurate statistics. In cases where there are fewer than 10 sales, the ratio statistics are not used to calculate the base (Table I).

	Number of Sales	Total Assessed Values	Total Sales Prices	Weighted Ratio	Average Ratio	Median Ratio
Allegany	5	947,900	1,034,000	91.7%	92.7%	95.0%
Anne Arundel	23	69,589,200	85,560,167	81.3%	100.5%	97.9%
Baltimore City	71	509,994,900	527,612,666	96.7%	94.0%	99.2%
Baltimore County	49	101,273,100	120,447,773	84.1%	95.2%	94.5%
Calvert	3	2,351,600	2,999,500	78.4%	83.6%	87.6%
Caroline	3	855,400	846,000	101.1%	100.2%	101.2%
Carroll	15	14,836,100	15,347,699	96.7%	88.5%	87.5%
Cecil	12	7,443,500	8,889,650	83.7%	92.1%	93.7%
Charles	19	123,728,500	149,018,212	83.0%	95.9%	97.1%
Dorchester	0	0	0	0.0%	0.0%	0.0%
Frederick	20	21,119,700	23,964,319	88.1%	93.6%	99.4%
Garrett	4	951,100	1,035,000	91.9%	105.5%	112.1%
Harford	9	4,398,300	5,863,000	75.0%	92.0%	95.0%
Howard	12	23,051,700	25,149,137	91.7%	100.0%	98.2%
Kent	0	0	0	0.0%	0.0%	0.0%
Montgomery	43	141,109,300	167,326,046	84.3%	93.4%	97.6%
Prince George's	42	261,156,300	274,114,050	95.3%	93.7%	95.1%
Queen Anne's	21	12,654,400	12,638,150	100.1%	101.8%	100.1%
St. Mary's	0	0	0	0.0%	0.0%	0.0%
Somerset	0	0	0	0.0%	0.0%	0.0%
Talbot	30	28,774,400	36,719,098	78.4%	90.6%	95.0%
Washington	14	9,208,000	9,529,780	96.6%	99.8%	99.7%
Wicomico	20	14,871,900	22,819,000	65.2%	91.7%	96.9%
Worcester	26	21,760,200	26,003,400	83.7%	89.9%	96.1%
Statewide	**441**	**$45,840,100**	**$58,352,180**	**78.6%**	**92.8%**	**97.9%**


Residential Sales Sorted by Ratios
37
157
605
1999
6137
8785
2056
660
278
136
100
56
40% - 49%
50% - 59%
60% - 69%
70% - 79%
80% - 89%
90% - 99%
100% - 109%
110% - 119%
120% - 129%
130% - 139%
140% - 149%
150% - 160%

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