



Office of Tax and Revenue
Real Property Tax Administration
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Office of the Chief Financial Officer
Office of Tax and Revenue
Real Property Tax Administration



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Disclaimer:

This publication represents a selected compilation of materials developed and used by the Real Property Assessment Division of the Office of Tax and Revenue during the 2018 revaluation of real property in the District of Columbia. As such, it does not purport to be an exhaustive collection of all assessment administration documents and materials. Its primary purpose is designed to be a quick reference guide for the real property assessor in his/her day-to-day work activities. Please feel free to call or fax your comments or suggestions to the contact numbers below. Thank you.

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2018 ARM

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**OFFICE OF TAX AND REVENUE
REAL PROPERTY TAX ADMINISTRATION INTER
OFFICE MEMORANDUM**

TO: Real Property Assessment Division

FROM: Steve Cappello, Chief Appraiser

SUBJECT: Tax Year 2018 Reassessment

DATE: 3/6/2017

Dear Colleagues:

I would like to take this opportunity to congratulate you and thank you for your efforts in the successful Tax Year 2018 revaluation effort. The fair-market value was established, as of January 1, 2017, on a total of 198,959 parcels.

Our efforts indicated that the total value of all the property in the District of Columbia is now over a quarter-trillion dollars, an astounding number. We had modest increases in values from TY 2017 to TY 2018. The base increase over TY 2017 was approximately \$10.5 billion, whereas last year's base increase was slightly higher at \$12.6 billion. The market is telling us that the rate of growth may be slowing down a bit.

The table below summarizes the results of the TY 2018 valuation effort. More specific details are outlined toward the back of this Appraiser Reference Materials to include residential, commercial and exempt property breakdowns by wards and neighborhoods.

Property Type	2017 Value	2018 Value	Base Increase	% Change
Class 1	\$114,773,680,623	\$121,106,947,391	\$6,333,266,768	5.52%
Class 2	\$98,605,035,269	\$101,841,104,826	\$3,236,069,557	3.28%
Total Taxable	\$213,378,715,892	\$222,948,052,217	\$9,569,336,325	4.48%
Exempt	\$26,158,058,466	\$27,090,446,008	\$932,387,542	3.56%
All Properties	\$239,536,774,358	\$250,034,498,225	\$10,501,723,867	4.38%

In addition, to the revaluation, we completed the second-half TY 2017 supplemental that added an additional \$1.42 billion to the tax roll.

Now that the notices have been delivered, we turn our attention to the upcoming appeal season. Year in and year out this division excels as we conduct first level appeals and I am always proud of the courtesy and professionalism we demonstrate to the taxpayers of the District.

Recall the meeting we attended at the convention center not long ago, where Mr. DeWitt introduced his continuous improvement initiative under the name of “be SMARTER.” With the spirit of that meeting in mind, I encourage each of you to look around, and even outside-the-box, to see if there is any area within RPAD that needs to be improved. From so many diverse perspectives I’m sure there are some great ideas to bring forth. Talk with your supervisor or me and we’ll be as responsive as possible. So many of the improvements we are now enjoying came directly from your efforts.

With regard to initiatives, I’d like to highlight several significant accomplishments made in the division. The following initiatives have recently been implemented:

- Office space expansion and reconfiguration
- Appraiser Education & Certification Program
- Access to more vehicles
- Development of an annual assessment calendar
- Frequent staff meetings
- Development of a Market Analysis document highlighting commercial valuation information

The following initiatives are expected to be delivered over the course of the next several months:

- New version of CAMA to be deployed to include fixes of known issues
- New Pictometry oblique imagery available within CAMA
- Acquiring a state-of-the-art Appeals Tracking System for next filing season
- Piloting an iPad field computer project for field work in both residential and commercial units
- Hiring vacant positions to ensure the division is fully staffed at 81 employees
- Modification and enhancements to our Apartment and Retail valuation models

I’d like to single out one of the initiatives of which I am especially proud. The *Appraiser Education & Certification Program* was established this past year and has enjoyed great success. Currently there are twenty-four appraisers enjoying the prestige and benefits of their DC designations. I’d encourage the appraisers to take advantage of the educational opportunities the program offers. Educational attainment not only increases your skills and abilities, it goes to help the division excel at its core duties and responsibilities.

In our continuing effort to provide stellar customer service, I would ask that over the next several weeks leading up to the hearings you familiarize yourselves with the contents of our Web site. We’ve made some significant changes to our web presence this year with vastly improved electronic filing of both Income & Expense form and First-Level Appeals application. The Income & Expense filing improvements will ensure that the appraisers have the most current information available to them much earlier than in the past. Please take a minute or two to explore these improved features so you may be able to assist the public, if needed.

In closing, I want to thank all of you - supervisors, appraisers and support staff for your hard work and dedication. Take pride in being a part of developing fair and equitable assessments conducted by the best assessment office in the country!

Explanation of Residential Market-oriented Cost Method

Note: The market-oriented cost approach to valuation is further explained and illustrated in the document, *Vision Residential Valuation Process*.

The market-oriented cost approach involved the following:

1. Extracting the CAMA data from approximately 11,030 qualified sales and importing it into SPSS.
2. Building a preliminary regression model that reflects the variables of the CAMA cost approach.
3. Reviewing the results of the preliminary regression to identify candidate market areas where the data was such to allow for successful regression analysis.
4. Eliminating outliers in the candidate areas to better ensure accuracy of the regression results.
5. Establishing time adjustment factors in order to analyze sale prices as of a specific point in time. The city was divided into 4 major market areas for time adjusting sale prices. Market data indicated monthly time adjustment factors over 32+ months (1/1/2014 through 9/27/2016) as follows:

	1/1/14 – 12/31/14	1/1/15 – 12/31/15	1/1/16 – 9/30/16
“Southeast” Neighborhoods (2, 3, 16, 18, 22, 28, 32, 33, 43)	0.70% /mo	0.90% /mo	0.20% /mo
“Northeast” Neighborhoods (5, 6, 7, 12, 14, 15, 17, 19, 31, 35, 36, 42, 47, 48, 49, 51, 52, 56, 66)	0.60% /mo	0.70% /mo	0.60% /mo
“Northwest” Neighborhoods (1, 4, 8, 11, 13, 21, 23, 24, 25, 26, 27, 29, 30, 34, 37, 38, 41, 50, 53, 54, 55)	0.40% /mo	0.30% /mo	0.40% /mo
“Downtown” Neighborhoods (9, 10, 20, 39, 40, 46)	0.70% /mo	0.50% /mo	0.40% /mo

6. Building a final regression model, using the time-adjusted sale price as the dependant variable.
7. Calibrating that model using non-linear multiple regression. Variables were included to extract land values from the market.
8. Reviewing the regression predicted values and removing extreme outliers.
9. Examining the predicted-values-to-time-adjusted-sale-price ratios for equitability with respect to lot size, building area, age, use, grade, and location.
10. Entering the coefficients indicated by the regression analysis back into the CAMA program’s cost model.
11. Applying the cost model in CAMA and reviewing the resulting values to ensure they agreed with the predicted values produced by the regression.
12. Performing sales analysis to determine if acceptable levels of assessment were achieved and adjusting rates as necessary.
13. Applying model to inventory and producing old-to-new (outlier) reports and percent change detail analysis reports for appraiser review.
14. Incorporating oversight of the computer aided procedure by our professional staff cited in the *2018 Valuation Review Process*. All projected market value changes are submitted to the staff for their review, refinement, and adjustments.

Explanation of Residential Condominium Valuation Methods

Regression:

The sales comparison approach using multiple regression analysis involved the following:

1. Extracting the CAMA data of qualified sales and importing it into SPSS.
2. Reviewing data to determine what regimes were candidates for regression analysis. As a rule, regimes could be valued using regression where the physical data attributes were complete and adequate sales data existed. Regimes without adequate sales, but with complete data, could be clustered with regimes having similar profiles to allow regression to be used.
3. Exploring the data to determine what variables would likely contribute to the model.
4. Building a base model.
5. Reviewing the results of the base model and eliminating outliers in the candidate regimes to better ensure the accuracy of the regression results.
6. Establishing time adjustment factors in order to analyze sale prices as of a specific point in time.
7. Building a final regression model, using the time-adjusted sale price as the dependant variable.
8. Calibrating that model using multiple regression analysis.
9. Applying the model to the sales, reviewing the predicted values and removing extreme outliers.
10. Performing sales analysis to determine if acceptable levels of assessment were achieved and adjusting rates as necessary.
11. Extracting condominium inventory data and importing into SPSS.
12. Applying model to inventory, and exporting the values back to CAMA, allocating 30% of predicted value to land and 70% of predicted values to improvements.
13. Producing percent change reports for appraiser review.
14. Identifying necessary corrections to data and location adjustments.
15. Repeating process of extracting data, applying model, and exporting back to CAMA to include corrections.

Final Appraiser Review:

At the conclusion of the valuation, several reports are produced showing the results of the reassessment. These reports, reflecting proposed market value changes, are submitted to the assessment staff for their review, refinement and adjustment in accordance with the processes outlined in the 2018 Valuation Review Process document.

The Condominium Regression Model:

$ESP = (353.65 * 800 * SIZE_ADJ * EFFIC_ADJ * COND_ADJ * VIEW_ADJ * BATH_ADJ + PARK_ADJ) * LOC_ADJ$.

Estimated Sale Price (ESP) – the value predicted by the model for the parcel, given the variables in the model, the coefficients of those variables and the attributes of the subject unit.

Base Rate (353.65) – base size rate (constant)

Base Size (800) – base unit size (constant)

Size Adj. – the adjustment for the unit's size being larger or smaller than the base size

The base unit size is 800 sf. The formula for calculating the size adjustment is:

Unit size up to 2000 sf: $(SIZE/800)^{.671168}$

Unit size larger than 2000 sf: $(2000/800)^{.671168} * (SIZE/2000)^{.896255}$

See graph titled Condominium Size Curve.

Efficiency Adj. – if the unit is an efficiency unit, a 0.93 adjustment is applied.

Condition – adjustment for the unit's physical condition

(1) Poor	.75
(2) Fair	.90
(3) Average	1.00
(4) Good	1.08
(5) Very Good	1.17
(6) Excellent	1.27

View – adjustment for the unit's view

(1) Poor	.85
(2) Fair	.93
(3) Average	1.00
(4) Good	1.05
(5) Very Good	1.10
(6) Excellent	1.15

Bath Adj. – adjustment for the unit's number of baths more than one.

$$BATH_ADJ = 1 + (((FULLBATH - 1) + (.5 * HALFBATH)) * .08)$$

Example: $2 \frac{1}{2} \text{ baths: } 1 + (((2 - 1) + (.5 * 1)) * .08) = 1.12$
 $3 \text{ baths: } 1 + (((3 - 1) + (.5 * 0)) * .08) = 1.16$

Parking – adjustment for Limited Common Element parking

<u>Outdoor</u>	<u>Covered</u>	<u>Indoor</u>	subject to location adjustment
14,150	15,550	21,200	

Location – adjustment for unit's geographic location

Location adjustments were made for neighborhood, sub-neighborhood, cluster of regimes, or unique regime. The actual location adjustment for any unit may be the combination of one or more of those location factors.

Explanation of Cooperative Valuation Method

Cooperatives are a type of residential property. In a cooperative, a corporation owns the property and the shareholders can use the unit or units represented by their shares. In Washington, DC, cooperatives are assessed according to the statute by one of three methods. The first method is calculating the cumulative value of the leasehold interests (by sales). The second method is to treat the project as if it were a condominium project and then reduce the value by 30%. After arriving at either of these values, we further reduce the value an additional 35% according to the statute. The third method is available only to Limited Equity Cooperatives.

Limited-equity cooperatives (LEC) are defined in the DC official Code in § 47-802 (11) as, “one required by a government agency or non-profit to limit the resale price of membership shares to keep the housing affordable for low and moderate income buyers.” The assessed value of the improved real property owned by an LEC is the lesser of the previously described approaches or the annual amount residents pay in carrying charges (excluding subsidies), divided by an appropriate capitalization rate as determined by the Office of Tax and Revenue (OTR).

For tax year 2018, we reviewed complexes with sales information and calculated the sales price per square foot taking into consideration remodeling and renovation from building permits and information from listings. Sales information is collected from the Recorder of Deeds (transfer of Economic Interest Tax Return Cooperative Only forms and the Multiple Listing Services). Insignificant or no time adjustments were deemed necessary for this period. For previous years matched pairs sales were used to calculate the typical percentage increase per month. Multiplying the square footage of the units by the adjusted rates (occasionally they were adjusted for view or parking as sales indicated) would result in the aggregate value which were further reduced for personal property and the result multiplied by 65% to arrive at the assessment.

In complexes where there were no sales, we treated them as if they were condominiums. To accomplish this, we would find a comparable condominium and obtain the appropriate square foot rate. The square foot rate gets adjusted for dissimilarity in condition and/or location before it is multiplied by the square footage of the subject cooperative. The result is then reduced by 30% and additionally by 35%. The complexes without sales were typically limited equity coops or very small complexes.

2018 Valuation Review Process

As part of the valuation process, initial assessments for all properties will be estimated and preliminary reports will be generated summarizing the results of the valuation effort. Your review, modification and approval of the proposed assessments indicate that they are representative of the estimated market value.

The Valuation Review Process is designed to allow for a thorough review of the new values for the upcoming tax year before notices are sent to property owners.

The purpose of this review is two-fold. First, it allows us the opportunity to correct any errors that may have occurred in the valuation process before they cause administrative difficulties (i.e. public relations problems, unnecessary appeal activity, and the like). Second, the process provides feedback to the CAMA modeling and calibration process.

The process involves examining all assessments with particular attention given to the outliers in a relatively short period of time. As such, the appraiser is primarily concerned with arriving at a reasonable final value estimate for all accounts by focusing attention to the properties on the outlier list, known as the Old-to-New Report. Briefly, the process involves the appraiser of record reviewing a selected group of properties in their neighborhood that, on first inspection, appear to be over or under appraised based on previously determined criteria such as sales price, percent change reports, etc. When this review indicates correct values, no records are changed; however, if the value requires modification, the appraiser will make changes in the CAMA record and on the PRC to correct the situation. If he/she discovers minor discrepancies in the data, it should be noted and corrected or revisited during another inspection program at the discretion of the appraiser. The purpose of this program is not to engage in a detailed analysis of accounts but rather to expeditiously review outlier accounts to improve our estimate of market value.

NOTE: It is advisable that the appraiser has a solid knowledge of CAMA valuation before proceeding with the review process. Please refer to the most current version of the “*CAMA Residential Construction Valuation Guideline*.” Along with the report entitled “VISION CAMA Valuation,” the guideline will serve as a tutorial for the methodology employed within CAMA for valuing residential property.

Following are some general guidelines to consider while conducting review activity.

1. The valuation review process begins with CAMA producing two reports for each (sub) neighborhood. The first report is the “Old to New” report that shows the old value, new value, percent and dollar change in value from the current assessment to the proposed assessment for specific properties that constitute outliers in the (sub) neighborhood. Included are the individual PRCs for each corresponding account listed in the report where the proposed value increased 10 percentage points or more above the median percent change for the (sub)

neighborhood or decreased 10 percentage points or more below the median percent change. The second report, Percent Change Detail Analysis, contains more specific detail about all of the accounts in the selected (sub) neighborhood.

2. The appraiser will be provided these two individual reports for each of the assigned (sub) neighborhoods, along with individual PRCs from the Old-to-New report.
3. Before individual reviews of the Old-to-New report begins, the appraiser will examine the Percent Change Detail Analysis report for signs of irregularities or general discrepancies based on their knowledge of their neighborhoods. The review entails several tasks as follows:
 - A. Review the “A/S Ratio”, when present. The ratios are calculated based on sales over a long period of time. Pay particular attention to sales that occurred during calendar year 2016. These sales will give a better picture of the most recent assessment/sales ratio reflective of the current market conditions. Where the assessed values are not close to the sales prices, fully examine the record, and consider making appropriate changes. The “VC” flag can be used to indicate that a sale has been previously disqualified, possibly rendering an unusual ratio less meaningful. Additionally the review of the “VC” code with an unusual ratio may indicate that a previously qualified sale needs to be now disqualified.
 - B. Examine the “Grade” of the accounts. If there is a two or more departure of grade between the account and the typical grade in the (sub) neighborhood, the appraiser may be concerned.
 - C. Look for extremes in the “Cond” and “% Good” data. Again, on average, these should be relatively consistent throughout the (sub)neighborhood.

The preferred process to follow when conducting individual reviews of accounts contained on the Old-to-New report (residential only) is as follows:

1. The appraiser will examine each record that appears on the “Old to New” report. Each record has been selected for inclusion because the proposed value decreased 3 percentage points or more below the median percent change for the (sub) neighborhood or increased 10 percentage points or more above the median percent change for the (sub) neighborhood. However, PRCs were printed for records where the proposed value decreased 10 percentage points or more below the median percent change for the (sub) neighborhood or increased 10 percentage points or more above the median percent change for the (sub) neighborhood. As a result, there will probably be more accounts listed on the “Old to New” report than printed PRCs. These records constitute the “outliers” of

the (sub) neighborhood. The values may be correct or erroneous, and the purpose of this process is to make that determination.

2. The appraiser, exercising his or her professional skill and judgment, first will conduct a “desk review” of each account appearing on the report. If the value does not seem reasonable perform the following actions:
 - A. Examine the PRC for any missing or incorrectly coded data contained in the Construction Detail section.
 - B. In the Building Summary Section, check the sq. ft. sizes of the areas listed for accuracy and reasonableness.
 - C. Check the Building Cost Section for correct Effective Area, Special Feature RCN and % Good. If any are erroneous, examine their respective sections for details.
 - D. Examine the Special Features/Amenities and Detached Structures sections for accuracy.
 - E. On the front of the PRC, check the Land Line Valuation Section for proper size and value.
 - F. Make use of the Pictometry tool available in the Mobile Video Viewer or the Mapping Apps folder.
3. Several results may occur from the desk review:
 - A. The desk review indicates the value is correct. In this case, note in the column adjacent to the account “OK”, your initials and the date.
 - B. The desk review indicates an erroneous value discovered by examining various reports and records (i.e. Percent Change, CAMA record, etc). In this case, the appraiser makes the correction in the CAMA record, notes the changes made on the PRC in red, notes on the Old-to-New report the new amount, your initials and the date.
 - C. The desk review is inconclusive and a field inspection is in order.

An example may help illustrate scenario “A”, the first situation. Let’s say the Old-to-New report indicates an account has jumped 400%, from \$300,000 to \$1,200,000! That amount of increase seems absolutely erroneous. To determine a possible explanation, the appraiser begins the review by locating the account on the Percent Change Detail Analysis report. After finding the account, the appraiser notices that the properties close to the account have only increased by approximately 20%, the median for the neighborhood. They are approximately similar to the account in size, grade, and condition, but their prior year’s value was \$900,000, while the outlier was only \$300,000. The appraiser would be safe to conclude that the account was grossly under-assessed last year. The low “old” value caused the large increase in value, not an over-assessed new value. To complete the desk review, the appraiser notes on the Old-to-New report, “OK”, his/her initials and the date.

Scenario “B”, the second situation, may find the appraiser reviewing an account that also appears to be over-assessed based on the large increase from old to new value. The appraiser again locates the account on the Percent Change Detail Analysis report and reviews the account in context to other (sub)neighborhood properties. The appraiser discovers that most of the data about the account is similar to the other properties – same use code, similar size, percent good, etc. However, where most of the properties are listed at Grade 4, the account is Grade 7. This would help explain the likelihood that the account is over-assessed. The appraiser would make the change to the grade in the CAMA system, note the new value, make the change on the PRC in red, and document the change on the Old-to-New report by writing the new value, his/her initials and the date in the far right column of the report next to the account.

The last scenario, “C”, results when the appraiser can not immediately explain the reason an account appears on the Old-to-New report. He/she should set aside accounts that will require field inspection and at a point, go to the field for inspection. Upon conclusion of the inspection, the appraiser will document the results in a similar manner to the desk reviews. The actual schedule for field- work will vary and will be coordinated by the appraiser and his/her supervisor.

Records Retention , Old-to-New Reports (residential only) and Percent Change Detail Analysis Reports (residential, residential condominium, commercial) are to be retained for two years, so that the current and proposed years are readily available for review. The retained reports will reflect all necessary dates and initials, indicating the required review and approval. The supervisor for each unit will be responsible for ensuring compliance with the review process within their unit, and for the retention of their unit's reports for the appropriate period of time. Reports may be discarded when they are no longer the current or proposed year. For example, upon the completion of the tax year (TY) 2018 revaluation, the TY 2016 reports may be discarded, and the reports from TY 2017 (current) and TY 2018 (proposed) must be on file.

Assessment Roll and Property Owner Notification

Upon completion of the annual reassessment and following the detailed final edit by appraisers, the CAMA manager runs a series of edit programs that makes final edits and consistency checks of all accounts. Any problems are returned to appraisers for review or correction. Following corrections, the CAMA Manager completes a final edit and uploads the required information via CAMA extract to the Integrated Tax System.

Annual Assessment Notices to notify property owners may be printed from ITS in batch mode or an extract may be produced for an outside vendor to produce assessment notices.

Market Approach to Land Valuation in Costed Neighborhoods

A non-linear regression model was used to calibrate the residential cost model. It was developed from citywide market analysis of qualified sales. One of the variables calibrated by the model was the land rate. Base land rates were adjusted for location in each sub-neighborhood. Regression analysis calibrated the land and building components of the model at the same time using the same market data. Additionally, the analysis established four size curves for land area. The four size curves indicate that as lot sizes increase, values also increase. However, with land size curve “3” values increase more rapidly with size as compared to land size curve “2”. Land size curve “1” increases at the smallest rate. In all three cases, land rates decrease as land area increases. Market data supports both curves up to approximately 5 times the standard lot size. However, in application, rates are assumed to continue similar decreases beyond that point. Each sub-neighborhood was assigned to one of the three land size curve groups based upon analysis of the qualified sales data. It is important to keep in mind, that land value is only one component of a number of variables that contribute to a property’s sale price and/or estimated market value. In practical terms, it is the combination of all of a property’s attributes, nuances in the market, and buyer preference that contribute to the final market value of a property. It is difficult to isolate some of the contributory elements and value them separately with certainty. Nevertheless, it is required in the District of Columbia that land and building values be separated for assessment purposes. Because of this requirement, it is necessary to create land rate tables for use in the District’s CAMA product. These rates were developed in the regression analysis referred to above. The results of the analysis are applied to the market-oriented cost model in the Vision CAMA system.

Land is calculated in Vision using the following algorithm:

Area * ((Base Rate * Size Adj) + \$ Special Adj 1 + \$ Special Adj 2) * % Special Adj 1 * % Special Adj 2

Where:

Area is the lot size expressed in square feet.

Base Rate is the market-derived rate for each sub-neighborhood.

Size Adj is the market-derived adjustment made for the lot size as it relates to the standard size lot for the sub-neighborhood. The look-up along the size curve is based on the ratio of the subject lot size to the standard lot size.

% Special Adj is any adjustment present that is expressed and applied as a percentage adjustment to the rate.

\$ Special Adj is any adjustment present that is expressed and applied as a dollar adjustment to the rate.

Land Rate Development Example

A hypothetical example may help illustrate how regression analysis develops the base land rates and subsequent adjustments to the rates. Suppose two properties in a neighborhood were recently sold. The first, comprised of just a house without land, sold for \$400,000. The second property had the identical house but with a lot of 2,000 square feet (sf.), the typical size for that neighborhood. It sold for \$600,000. In a process similar to adjusting comparables in the sales comparison approach to value, regression analysis identifies the contributory value of the lot to the second property and sets its value to \$200,000. The base land rate of \$100 per sf ($\$200,000/2,000$ sf) will be the basis for lot values for all other properties in that (sub)neighborhood.



Next, let us assume another house sells. On this occasion, the house is identical to the previous sale in all respects, except the lot size was 4,000 sf instead of the “standard” (base lot) size of 2,000 sf. This house recently sold for \$700,000, \$100,000 more than a property with the standard lot size. The land component of this sale is \$300,000.



This sale helps develop size adjustments for non-standard lots in the neighborhood. If no adjustment was made to the land rate, the land component of this sale would be \$400,000 ($4,000$ sf * \$100). The appraisal would overstate the value of the property by \$100,000. An adjustment to the base land rate is necessary to recognize the market response to the departure from the standard lot size. Regression analysis would calculate the appropriate land size adjustment necessary to properly determine the contributory value of the larger lot. Dividing the market-indicated value of the lot by the unadjusted appraised value of the lot ($\$300,000/\$400,000$) yields a factor of 0.75. In this example, CAMA would follow the model:

$$\text{Appraised land value} = \text{Area} * (\text{Base Rate} * \text{Size Adj})$$

or

$$\$300,000 = 4000\text{sf} * (\$100 * .75)$$

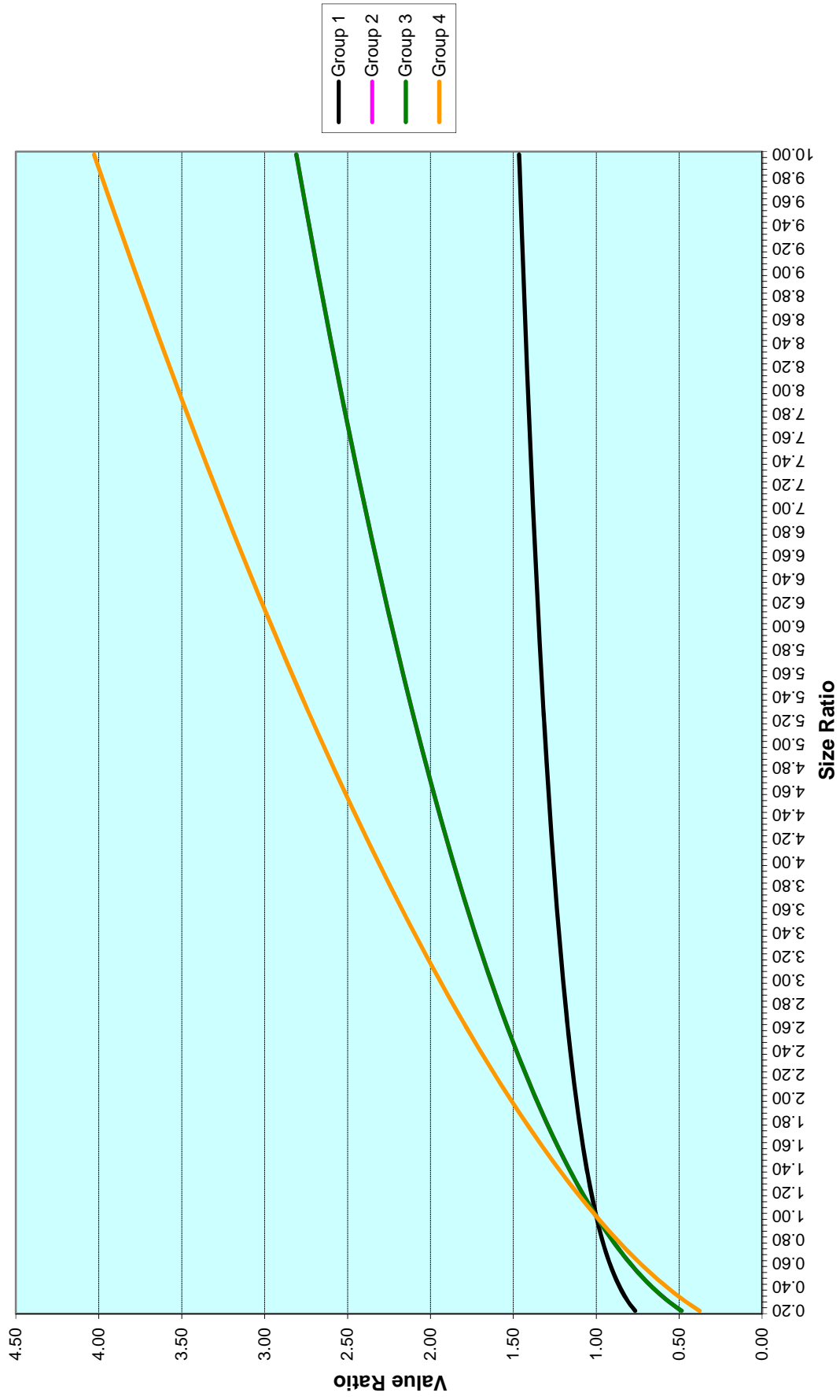
Residential Base Land Rates By Neighborhood

NBHD	Base Lot Size	Base Rate	Base Lot Value	Size Curve
1A	4000 sf	\$115.96	\$463,840	LG1
1B	5000 sf	\$99.66	\$498,300	LG1
1C	5000 sf	\$102.96	\$514,800	LG1
2A	2000 sf	\$62.17	\$124,340	LG1
2B	2000 sf	\$62.91	\$125,820	LG1
3	2000 sf	\$59.45	\$118,900	LG1
4A	6700 sf	\$107.08	\$717,440	LG3
4B	10000 sf	\$93.73	\$937,300	LG4
4C	8000 sf	\$109.97	\$879,760	LG4
5A	1700 sf	\$119.95	\$203,920	LG1
5B	1700 sf	\$121.57	\$206,670	LG1
6A	4000 sf	\$74.02	\$296,080	LG1
6B	4000 sf	\$73.68	\$294,720	LG1
6C	2000 sf	\$126.31	\$252,620	LG1
6D	4000 sf	\$71.87	\$287,480	LG1
6E	3000 sf	\$89.95	\$269,850	LG1
7A	2000 sf	\$111.29	\$222,580	LG1
7B	3000 sf	\$81.00	\$243,000	LG1
7C	3000 sf	\$89.29	\$267,870	LG1
7D	5000 sf	\$59.96	\$299,800	LG1
7E	2000 sf	\$143.72	\$287,440	LG1
8A	2000 sf	\$240.50	\$481,000	LG1
8B	2000 sf	\$249.20	\$498,400	LG1
9A	1400 sf	\$359.08	\$502,710	LG2
9B	1400 sf	\$369.19	\$516,870	LG2
9C	1400 sf	\$383.59	\$537,030	LG2
10	1400 sf	\$504.92	\$706,890	LG1
11A	5000 sf	\$100.26	\$501,300	LG1
11B	5000 sf	\$99.51	\$497,550	LG1
11C	5000 sf	\$96.88	\$484,400	LG1
11D	5000 sf	\$90.90	\$454,500	LG1
11E	5000 sf	\$85.98	\$429,900	LG1
12	4000 sf	\$65.09	\$260,360	LG1
13	5000 sf	\$162.24	\$811,200	LG4
14	9000 sf	\$48.06	\$432,540	LG1
15A	1800 sf	\$233.16	\$419,690	LG1
15B	1800 sf	\$208.55	\$375,390	LG1
15C	1800 sf	\$204.71	\$368,480	LG1
15D	1800 sf	\$225.73	\$406,310	LG1
15E	1800 sf	\$238.11	\$428,600	LG3
16A	2400 sf	\$45.79	\$109,900	LG1
16B	2400 sf	\$46.73	\$112,150	LG1
16C	2400 sf	\$43.41	\$104,180	LG1
17	6000 sf	\$73.97	\$443,820	LG1
18A	3000 sf	\$42.35	\$127,050	LG1
18B	3000 sf	\$41.10	\$123,300	LG1
18C	3000 sf	\$38.86	\$116,580	LG1
18D	3000 sf	\$38.09	\$114,270	LG1

NBHD	Base Lot Size	Base Rate	Base Lot Value	Size Curve
18E	3000 sf	\$43.27	\$129,810	LG1
19A	1800 sf	\$229.61	\$413,300	LG1
19B	1800 sf	\$189.01	\$340,220	LG1
20	1000 sf	\$547.52	\$547,520	LG1
21	9000 sf	\$83.64	\$752,760	LG3
22A	3000 sf	\$38.93	\$116,790	LG1
22B	2400 sf	\$48.96	\$117,500	LG1
22C	3000 sf	\$37.89	\$113,670	LG1
22D	2400 sf	\$55.60	\$133,440	LG1
23	2500 sf	\$183.76	\$459,400	LG1
24	2400 sf	\$245.02	\$588,050	LG1
25A	1800 sf	\$326.99	\$588,580	LG3
25B	1800 sf	\$395.14	\$711,250	LG3
25C	1800 sf	\$352.89	\$635,200	LG3
25D	1800 sf	\$346.99	\$624,580	LG3
25E	1800 sf	\$421.87	\$759,370	LG4
25F	2000 sf	\$391.38	\$782,760	LG4
25G	2000 sf	\$389.19	\$778,380	LG3
25H	2000 sf	\$363.18	\$726,360	LG4
25I	800 sf	\$577.59	\$462,070	LG3
25J	1200 sf	\$490.03	\$588,040	LG4
26	1700 sf	\$288.88	\$491,100	LG1
27	9000 sf	\$51.85	\$466,650	LG1
28A	2400 sf	\$50.40	\$120,960	LG2
28B	5000 sf	\$32.17	\$160,850	LG1
28C	5000 sf	\$32.52	\$162,600	LG1
29A	2000 sf	\$303.26	\$606,520	LG4
29B	2000 sf	\$315.01	\$630,020	LG4
29C	2000 sf	\$334.76	\$669,520	LG3
30A	5000 sf	\$123.04	\$615,200	LG4
30B	5000 sf	\$122.13	\$610,650	LG4
30C	7000 sf	\$105.09	\$735,630	LG4
31A	1800 sf	\$251.10	\$451,980	LG1
31B	1800 sf	\$252.25	\$454,050	LG1
32A	5000 sf	\$27.35	\$136,750	LG1
32B	2000 sf	\$56.18	\$112,360	LG1
33A	2000 sf	\$56.25	\$112,500	LG1
33B	2000 sf	\$53.90	\$107,800	LG1
34	9000 sf	\$125.32	\$1,127,880	LG4
35	5000 sf	\$54.06	\$270,300	LG1
36A	2000 sf	\$246.39	\$492,780	LG1
36B	2000 sf	\$259.71	\$519,420	LG3
36C	1600 sf	\$276.82	\$442,910	LG1
37	3000 sf	\$181.58	\$544,740	LG3
38	5000 sf	\$158.23	\$791,150	LG4
39A	1500 sf	\$249.31	\$373,970	LG1
39B	1500 sf	\$271.08	\$406,620	LG1
39C	1500 sf	\$305.92	\$458,880	LG1

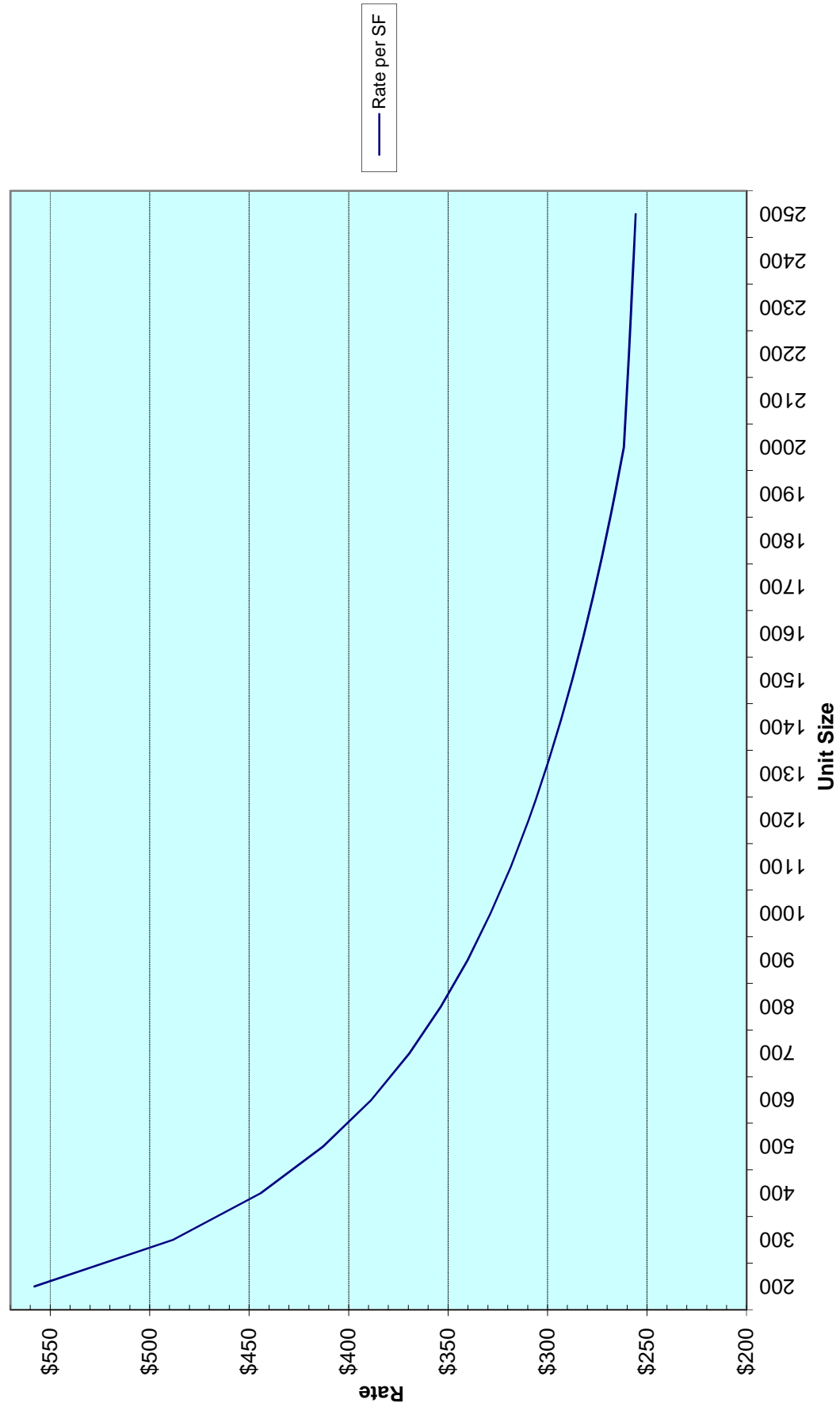
NBHD	Base Lot Size	Base Rate	Base Lot Value	Size Curve
39D	1500 sf	\$236.47	\$354,710	LG1
39E	1200 sf	\$308.91	\$370,690	LG1
39F	1200 sf	\$314.61	\$377,530	LG1
39G	1500 sf	\$214.84	\$322,260	LG1
39H	1500 sf	\$181.83	\$272,750	LG1
39J	1500 sf	\$284.63	\$426,950	LG1
39K	1500 sf	\$312.90	\$469,350	LG1
39L	1200 sf	\$320.90	\$385,080	LG1
39M	1500 sf	\$319.40	\$479,100	LG1
40A	1400 sf	\$284.71	\$398,590	LG1
40B	1400 sf	\$336.50	\$471,100	LG1
40C	1600 sf	\$367.61	\$588,180	LG2
40D	1600 sf	\$428.32	\$685,310	LG2
40E	1600 sf	\$424.61	\$679,380	LG2
40F	1200 sf	\$411.58	\$493,900	LG2
40G	1600 sf	\$320.25	\$512,400	LG1
41	5000 sf	\$117.62	\$588,100	LG2
42A	1800 sf	\$205.00	\$369,000	LG1
42B	1800 sf	\$176.86	\$318,350	LG1
42C	1800 sf	\$171.42	\$308,560	LG1
43A	2000 sf	\$63.29	\$126,580	LG1
43B	2000 sf	\$54.91	\$109,820	LG1
43C	2000 sf	\$59.59	\$119,180	LG1
43D	2000 sf	\$57.04	\$114,080	LG1
46	1200 sf	\$380.71	\$456,850	LG1
47	3000 sf	\$80.37	\$241,110	LG1
48	5000 sf	\$73.16	\$365,800	LG1
49A	3000 sf	\$127.73	\$383,190	LG1
49B	3000 sf	\$121.80	\$365,400	LG1
49C	3000 sf	\$116.34	\$349,020	LG1
50A	10000 sf	\$79.04	\$790,400	LG3
50B	6000 sf	\$100.67	\$604,020	LG2
50C	14000 sf	\$67.39	\$943,460	LG3
50D	15000 sf	\$84.16	\$1,262,400	LG3
51	3000 sf	\$89.06	\$267,180	LG3
52A	1800 sf	\$164.72	\$296,500	LG1
52B	1600 sf	\$176.41	\$282,260	LG1
52C	1600 sf	\$147.37	\$235,790	LG1
53	5000 sf	\$112.84	\$564,200	LG1
54A	6000 sf	\$136.11	\$816,660	LG4
54B	1000 sf	\$383.42	\$383,420	LG1
55	6000 sf	\$125.06	\$750,360	LG2
56A	5000 sf	\$53.81	\$269,050	LG1
56B	5000 sf	\$52.81	\$264,050	LG1
56C	5000 sf	\$47.89	\$239,450	LG1
56D	5000 sf	\$47.30	\$236,500	LG1
66	5000 sf	\$51.00	\$255,000	LG1

Residential Land Size Curves



*Group 2 and 3 combined for TY 2018

Condominium Size Curve



2018 Vision CAMA Residential Valuation Process

The market-derived cost approach to the valuation of real estate follows the generic formula of **Market Value = ((RCN-LD) + land value)**, where **RCN** is Replacement Cost New of the improvements and **LD** means Less Depreciation. When properly developed and calibrated, this approach is a reliable indicator of market value especially suited to mass-appraisal CAMA systems.

The following exercise will attempt to illustrate how the Vision[®] CAMA system utilized by the District of Columbia, calculates values using the above model. The first section will illustrate the development of the Replacement Cost New of a typical residence, the second will show the steps involved in determining the amount of depreciation that has accrued to the residence, and the last section will illustrate land or lot valuation.

Replacement Cost New

The Vision[®] CAMA system arrives at a RCN value for residential properties based on a market-calibrated hybrid cost model. The hybrid nature of the model simply means that the model employs both additive and multiplicative variables in its design and specification. The nature of the model will become clearer as we proceed through this exercise. Please also be aware that a model is dynamic in both its specifications and calibration. The specifications, those cost elements that comprise the model, may change from time to time based upon research and market conditions. As you may discover, the dollar rates, or calibrations, contained here most likely are different from the current model in use. The model used in this exercise is as follows:

$$\text{Building RCN} = [(\text{Base Rate} + \sum \text{ABRV}_n) * \text{Effective Area} * \text{Size Adjustment} + \sum \text{AFRV}_n] * (\text{MV}_0 * \text{MV}_2 * \dots * \text{MV}_n)$$

Where:

RCN = Replacement Cost New

Base Rate = \$ rate based on use code

ABRV = Additive Base Rate Variables

Effective Area = Adjusted SF area of improvement

Size Adjustment = Adjustment factor for deviation from base size

AFRV = Additive Flat Rate Variables

MV = Multiplicative Variables

Several items will be helpful while examining the features of the cost model and they are collected as Appendix “A” of this document. You will need to refer to them often during this exercise. They include the following:

- Sample home's Property Record Card (PRC)
- Cost.dat printout of the sample home
- 2007 CAMA Residential Construction Valuation Guideline

1. First, let's illustrate the calculation of the Effective Area of our sample home.

$$\text{Building RCN} = [(\text{Base Rate} + \sum \text{ABRV}_n) * \text{Effective Area} * \text{Size Adjustment} + \sum \text{AFRV}_n] * (\text{MV}_0 * \text{MV}_2 * \dots * \text{MV}_n)$$

Illustration 1 shows the CAMA sketch of the sample home we'll be using throughout this exercise.

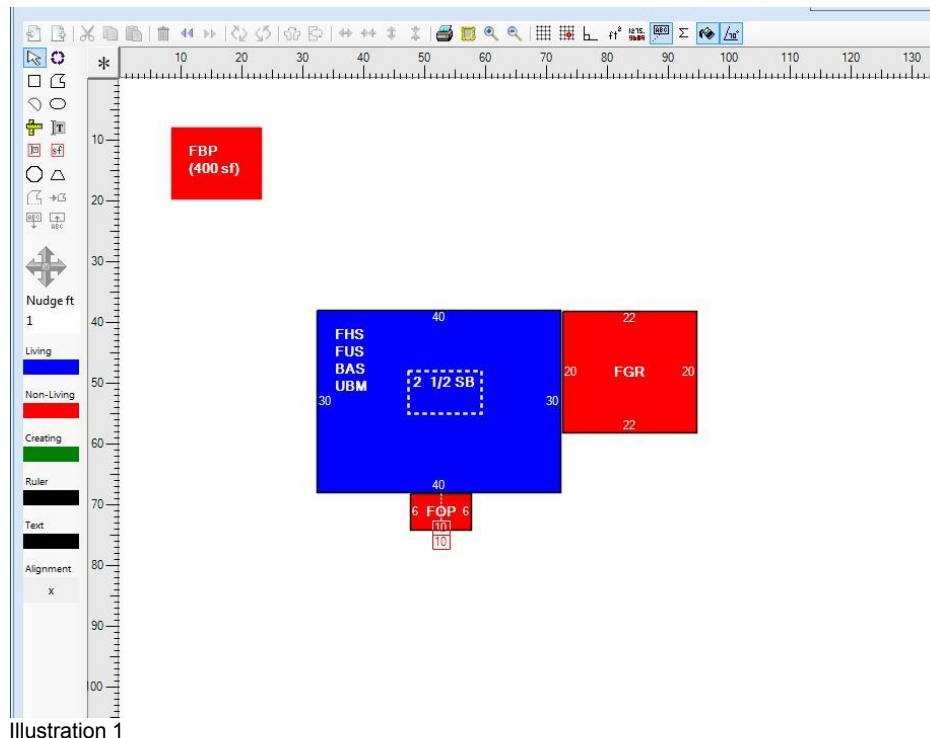


Illustration 1

It is described as a 2½ story single-family detached residence, with basement. It is brick veneer, frame construction with a two-car garage and small porch across the front. CAMA provides the information about the sizes of the various areas of the house in the depreciation section.

Section Summary					
Group	R11	Effective Area	3498		
Base Rate	133.84	RCN	\$1,881,638		
Eff Base Rate	\$474.10	Bldg % Good	91		
Net Other Adj	\$223,227.29	RCNLD	\$500		
Living Area/GBA 3000					
Code	Description	Gross	Living	Eff Area	
FHS		1200	600	600	
FUS		1200	1200	1200	
BAS		1200	1200	1200	
UBM		1200	0	300	
FGR		440	0	198	
FBP		400	0	0	

Illustration 2

The Effective Area is comprised of the totals of the base area (Main Building Area @ 1,200 SF), the finished second floor area (Upper Story, Finished @ 1,200 SF), the adjusted area of the finished half story (Half Story, Finished @ 50% of 1200 SF), the adjusted area of the garage (Garage, Attached @ 45% of 440 SF), and the adjusted area of the unfinished basement (Basement, Unfinished @ 25% of 1,200 SF).

The adjustments to the finished half story, garage and unfinished basement take into account these areas are not as expensive as the finished main building area. For example, if the base rate for the finished main building area is \$100/SF, the rate for the garage area may only be \$45/SF. The RCN value of the garage would be calculated as follows:

$$\text{RCN of Garage} = \$19,800 \text{ or } (440 \text{ SF} * \$45)$$

Another way to state the same situation is to adjust the size of the garage to 40% of its measured size and then multiply the resulting, *or effective*, size by the base rate of \$100/SF:

$$\text{RCN of Garage} = \$19,800 \text{ or } [(440 * .45) * \$100]$$

Both methods arrive at the same value for the garage. The first method is more intuitive and easier to explain to taxpayers as it adjusts for the differences in costs for the various areas. The second method again provides the same results but is much easier to model and calculate within a CAMA system, thus the effective area calculations shown here represent the methodology employed in the Vision[®] CAMA system.

Let's take a moment to examine the treatment of the basement in this house. The house has a full-sized basement comprised of 1,200 SF. In addition, the basement contains a finished area (400 SF), and the balance as unfinished. Illustration 3 shows the contribution of the unfinished portion to the effective area calculation. However, notice that the finished portion of the basement is not included in the effective area calculations. The value attributed to this finished area is accounted for as an Additive Flat Rate Variable later in the valuation model. The reason for this methodology is to ensure that the effective area is not erroneously overstated by the amount of any finished area in the basement.

	Code	Description	Gross	Living	Eff Area
▶	FHS		1200	600	600
▶	FUS		1200	1200	1200
▶	BAS		1200	1200	1200
	UBM		1200	0	300
	FGR		440	0	198
	FBP		400	0	0
▶	FOP		60	0	0

Illustration 3

Finally, the Gross Area shown in Illustration 3 is the total unadjusted size of all the areas that are a part of, and attached to, the home. The Living Area is the unadjusted size of the actual finished living area of the home.

With the inclusion of the Effective Area calculation, our cost model now looks like this:

$$\text{Building RCN} = [(\text{Base Rate} + \sum \text{ABRV}_n) * \text{3,498} * \text{Size Adjustment} + \sum \text{AFRV}_n] * (\text{MV}_0 * \text{MV}_2 * \dots * \text{MV}_n)$$

Effective Area

2. Next, let's look at the selection of the Base Rate for the sample home.

$$\text{Building RCN} = [(\text{Base Rate} + \sum \text{ABRV}_n) * \text{Effective Area} * \text{Size Adjustment} + \sum \text{AFRV}_n] * (\text{MV}_0 * \text{MV}_2 * \dots * \text{MV}_n)$$

The Base Rate is the dollar rate per square foot used in the valuation model that is derived from market analysis and selected based on the Use Code of the building. Our sample home is a "Use Code 012 - Detached", corresponding to a Residential-Detached-Single Family residence. The Base Rate is automatically selected by the CAMA system and the appropriate base rate for the sample home is \$ 149.27. Now the cost model looks like this:

$$\text{Building RCN} = [(\text{Base Rate} + \sum \text{ABRV}_n) * \text{3,498} * \text{Size Adjustment} + \sum \text{AFRV}_n] * (\text{MV}_0 * \text{MV}_2 * \dots * \text{MV}_n)$$

Base Rate **Effective Area**

3. The Base Rate of the home is just the start of the valuation process and it will be further modified as more specific features about the home are taken into consideration. Let's look at the first of two types of modifications that will affect the Base Rate, the Additive Base Rate Variables (ABRV).

$$\text{Building RCN} = [(\text{Base Rate} + \sum \text{ABRV}_n) * \text{Effective Area} * \text{Size Adjustment} + \sum \text{AFRV}_n] * (\text{MV}_0 * \text{MV}_2 * \dots * \text{MV}_n)$$

Additive Base Rate Variables represent a variety of features found in residential improvements. For example, the value for air conditioning and floor covering are such features. The typical characteristic of these ABRVs is that the features are usually an integral part, and therefore an integral cost, of the whole house. As such, the value of the particular ABRV is added to the Base Rate. Each ABRV incrementally increases the Base Rate by its own square foot rate. So therefore, the $\sum \text{ABRV}_n$ literally means the sum of all the rates for individual features are added to the Base Rate.

Highlighted in Illustration 4 are all the fields in the Construction Detail CAMA screen that can modify the selected Base Rate as ABRVs.

Parcel Information

SSL: 9999 / / / 9999 / / Primary Use: 011 Use Type: R1 Internal ID: 182803 Work In Prog: 0 Living Area: 3000
 Location: 9999 9TH ST NW #999999999 Total Assess: \$374,630 Land Acres: 5,000 \$SF/ Liv/GBA 124.88

Base Rate Values

Value Source C Living Area/GBA 3,000 RCN \$1,881,638 Regression 229220
 Prim Bldg Use 11 Effective Area 3,498 Bldg % Good 0.00 Income \$0
 Style 6 size Adjustment .89128 RCNLD \$500
 Bldg + XF RCN for All Bldgs \$2,629,919

Building #: 1 of 1 Section: 1 of 1

Style: 6: 2.5 Story Fin
 Model: 01: Single Family
 Grade: 12: Exceptional-D Overall Cndtn: 6: Excellent
 Stories: 12 Park Spaces: 0
 Foundation: 2: Average
 Exterior Wall: 15: Face Brick
 Exterior Cndtn: 4: Good
 Building Type: 1: Single
 Roof Cover: 3: Shingle
 Floor Cover: 11: Hardwood/Carp
 Interior Condition: 4: Good
 View: 3: Average
 No. Units: 1
 Heat Type: 1: Forced Air
 Eat in Kith: 0: Default
 AC Type: Y: Yes
 Bedrooms: 10
 Bathrooms: 4
 Half Baths: 2
 Total Rooms: 8
 Bath Style: 2: Semi-Modern
 Kitchen Style: 2: Semi-Modern
 Kitchens: 1
 Fireplaces: 1

Illustration 4

The Cost.dat sheet of our sample home lists each ABRV under the heading Base Rate Adjustments as follows:

*****Base Rate Adjustments*****

AIR CONDITIONING Y (Yes) = 1.8 + BaseRate
 EXTERIOR WALL 15 (Face Brick) = 3.95 + BaseRate
 FLOOR COVER 11 (Hardwood/Carp) = 4.67 + BaseRate
 ROOF COVER 3 (Shingle) = .68 + BaseRate

The sum, Σ , is \$11.10 (1.80+3.95+4.67+0.68). This will be added to the Base Rate of \$157.85 to give a modified Base Rate of \$168.95.

Our model now looks like this:

$$\text{Building RCN} = [(\text{Base Rate} + \Sigma \text{ABRV}_n) * \text{Effective Area} * \text{Size Adjustment} + \Sigma \text{AFRV}_n] * (\text{MV}_0 * \text{MV}_2 * \dots * \text{MV}_n)$$

4. Next, let us turn our attention to the second type of modification to the Base Rate - the Size Adjustment.

$$\text{Building RCN} = [(\text{Base Rate} + \sum \text{ABRV}_n) * \text{Effective Area} * \text{Size Adjustment} + \sum \text{AFRV}_n] * (\text{MV}_0 * \text{MV}_2 * \dots * \text{MV}_n)$$

The Size Adjustment modifies the Base Rate to account for the size difference between the “standard size” for the “typical” house in the model and the actual size of the sample house. The “standard” size of 1,800 SF for the “typical” house, consisting of a 2-story frame residence, is used as the basis for establishing the initial Base Rates used in CAMA. The adjustment in the Base Rate allows the proper square foot rate to be applied to a house based on its size. It is reasonable to expect that as a house becomes larger than typical, the rate per square foot would decrease and conversely, if the house were smaller than typical, the rate would be higher. This Size Adjustment variable is the component in the model that adjusts for this situation. Our sample home’s Size Adjustment is 0.89128 as listed on the Cost.dat sheet. Now our Base Rate is calculated to be \$150.58 $((157.85 + 11.10) * 0.89128)$.

Because the adjustment is less than 1.00, it would be proper to conclude that our sample home is larger than the typical 2-story home in the District of Columbia. Had the sample home been smaller than 1,800 SF, the Size Adjustment would have been greater than 1.00. The use of size adjustments eliminates the need for the traditional cost tables based on size.

The cost model continues to grow, and now looks like this:

$$\text{Building RCN} = [(\text{\$157.85} + \text{\$11.10}) * 3,498 * 0.89128 + \sum \text{AFRV}_n] * (\text{MV}_0 * \text{MV}_2 * \dots * \text{MV}_n)$$

Base Rate \sum ABRV_n Effective Area Size Adjustment

5. We are finished establishing the Base Rate for our sample home and now turn to the Additive Flat Rate Variables (AFRV). This portion of the cost model is relatively straightforward. The individual Additive Flat Rate Variables are summed and the added to the product of the previous calculations.

$$\text{Building RCN} = [(\text{Base Rate} + \sum \text{ABRV}_n) * \text{Effective Area} * \text{Size Adjustment} + \sum \text{AFRV}_n] * (\text{MV}_0 * \text{MV}_2 * \dots * \text{MV}_n)$$

Here is where we make allowances for individual extra features contained in the sample house. Illustration 5 shows some of those features that constitute Additive Flat Rate Variables in the cost model:

Parcel Information			
SSL:	9999/ / 9999 Primary L 011	Use Type R1	Internal I 182803
Location:	9999 9TH ST NW #999	Total Ass \$374,630	Land Acr 5,000
			Living Ar 3000
			\$SF/ Liv/ 124.88
Base Rate Values			
Value Source C	Living Area/GBA 3,000	RCN \$1,881,638	Regression 229220
Prim Bldg Use 11	Effective Area 3,498	Bldg % Good 0.00	Income \$0
Style 6	size Adjustment .89128	RCNLD \$500	
Bldg+XF RCN for All Bldgs \$2,629,919			
Building #: 1 of 1 Section: 1 of 1			
Style	6: 2.5 Story Fin	Overall Cndtn	4: Good
Model:	01: Single Family	Park Spaces	0
Grade	4: Above Average		
Stories:	2.5		
Foundation	2: Average		
Exterior Wall	15: Face Brick		
Exterior Cndtn	4: Good		
Building Type:	1: Single		
Roof Cover:	3: Shingle		
Floor Cover	11: Hardwood/Carp		
Interior Condition	4: Good		
View	3: Average		
No. Units	1		
Heat Type	1: Forced Air		
Eat in Kith	0: Default		
AC Type	Y: Yes		
Bedrooms	4		
Bathrooms	2		
Half Baths	2		
Total Rooms	8		
Bath Style	2: Semi-Modern		
Kitchen Style	2: Semi-Modern		
Kitchens	1		
Fireplaces	1		

Illustration 5

Unlike the Additive Base Rate Variables (ABRV) described earlier, most of these features are not an integral portion of the whole house, but stand alone, so to speak. Examples include such items as fireplaces, extra bathrooms, and extra kitchens. Again, as with other variables in the cost model, the values of these features are derived from market analysis.

Our sample home has several Additive Flat Rate Variables (AFRVs), including additional bathrooms and a fireplace. The cost for one full bath and one kitchen is always included in the original base rate. Any bathrooms or kitchens over and above the first are accounted for as AFRVs.

The value of an additive flat rate variable is calculated by multiplying the number of "units" by the dollar rate per unit. For example, illustration 5 shows our sample home also has two half baths. The AFRV for the half baths is \$16,250 (2 "units" X \$8,125 per unit) as shown in a portion of the Cost.dat file below.

Also included in the AFRVs are the partitioned finished basement and the small open porch on the front of the house. Recall that in illustration 3, neither of these

areas was included in the calculation of the effective area of the house, therefore, their valuations are included here, as AFRVs.

The partitioned finished basement is calculated to be \$22,000. In this case, "units", the gross square footage of 400 SF (shown in the sketch area of the record), are multiplied by the rate of \$55 per SF. The open porch is calculated in a similar manner.

*****Flat Value Additions*****
 FULL BATHS OVER 1 = 12500 + RCN
 HALF BATHS = 16250 + RCN
 FIREPLACES = 8000 + RCN
 PARTITIONED FINISHED BASEMENT = 22000 + RCN
 OPEN PORCH = 1320 + RCN

The sum, Σ , is \$60,070 (16,000+22,000+7,100+18,000+801) that will be added to the product of the previous portions of the cost formula.

The cost model is almost finished for our sample home, and now looks like this:

$$\text{Building RCN} = [(\text{Base Rate} + \Sigma \text{ABRV}_n) * \text{Effective Area} * \text{Size Adjustment} + \Sigma \text{AFRV}_n] * (\text{MV}_0 * \text{MV}_2 * \dots * \text{MV}_n)$$

6. The last portion of the cost model used to calculate the RCN are the multiplicative variables (MV).

$$\text{Building RCN} = [(\text{Base Rate} + \Sigma \text{ABRV}_n) * \text{Effective Area} * \text{Size Adjustment} + \Sigma \text{AFRV}_n] * (\text{MV}_0 * \text{MV}_2 * \dots * \text{MV}_n)$$

This portion of the formula can have the largest influence on the cost model. Each multiplicative variable modifies *all* of the cost data that has preceded it. These variables modify the Base Rate, the sum of all the increases to the Base Rate (ΣABRV_n), the Size Adjustment, and the sum of all the Flat Rate Variables (ΣAFRV_n). This is where such important characteristics as the building grade, building condition, remodeling, and location factors have their impact.

The sample home is graded "Above Average - 4", and consequently has a 1.091 multiplicative factor. This one variable, grade, is going to increase the RCN value of the sample home by 10%. Grade can have a sizable impact on the final value of the building. For example, a "Superior - 8" increases the final rate by 48% over that of an "Average Quality - 3" house.

The condition of the building is also accounted for by the multiplicative variables. The interior, exterior and overall conditions of our sample home are each "Good" and the corresponding multiplicative variable for each is 4.8%. The level of condition may be different for each of the three variables and therefore the coefficients may be different. Please refer to the *2007 CAMA Residential Construction Valuation Guideline --RPAD* for these and all other coefficients used in the valuation model.

Just as construction grade has a significant impact on the final value of a house, so does condition. For example, a house in overall "Poor" condition throughout will have its value reduced by 20.6%, whereas a house in excellent condition throughout will have its value increased by 10.5%. That's a range of over 31%.

Illustration "6" shows a portion of the features that constitute the multiplicative variables in the cost model:

The screenshot displays the 'Parcel Information' window in the CAMA software. The top section shows basic property details: SSL (9999 / / / 9999 / /), Primary Use (012), Use Type (R1), Internal ID (182803), Work In Prog (0), Living Area (3000), Location (9999 9TH ST NW #999999999), Total Assess (920,160), Land Acres (5,000), and \$SF/ Liv/GBA (306.72). Below this, 'Base Rate Values' are listed: Value Source C, Prim Bldg Use 12, Style 6, Living Area/GBA 3,000, Effective Area 3,498, size Adjustment .89128, RCN \$754,788, Bldg % Good 86.00, RCNLD \$649,120, Regression 229220, and Income \$0. The bottom section shows a list of building features with dropdown menus for selection. The 'Grade' dropdown is set to '4: Above Average', 'Overall Cndtn' is '4: Good', 'Exterior Cndtn' is '4: Good', and 'Interior Condition' is '4: Good'. Other features include Style (6: 2.5 Story Fin), Model (01: Single Family), Stories (2.5), Foundation (2: Average), Exterior Wall (15: Face Brick), Building Type (1: Single), Roof Cover (3: Shingle), Floor Cover (11: Hardwood/Carp), View (3: Average), No. Units (1), Heat Type (1: Forced Air), Eat in Kith (0: Default), A/C Type (Y: Yes), Bedrooms (4), Bathrooms (2), Half Baths (2), Total Rooms (8), Bath Style (2: Semi-Modern), Kitchen Style (2: Semi-Modern), Kitchens (1), and Fireplaces (1).

Illustration 6

Another important multiplicative variable, Remodel Type, takes into account whether or not the house has been remodeled and to what extent. In addition, the age of the remodel factors into the amount of adjustment applied by this multiplicative variable.

Our sample home was remodeled in 2001. The portion of the CAMA record that captures this information is shown in Illustration 7 below.

Parcel Information

SSL: 9999 / / 9999 Primary L 011 Use Type R1 Internal I 182803 Work In F 0 Living Ar 3000

Location: 9999 9TH ST NW #999 Total Ass \$374,630 Land Acrr 5,000 \$SF/ Liv/c 124.88

Base Rate Values

Value Source C Living Area/GBA 3,000 RCN \$1,881,638 Regression 229220

Prim Bldg Use 11 Effective Area 3,498 Bldg % Good 0.00 Income \$0

Style 6 size Adjustment .89128 RCNLD \$500

Bldg+XF RCN for All Bldgs \$2,629,919

Building #: 1 of 1 Section: 1 of 1

Section Level Depreciation

Year Built 1937

Effective Year Built 1950 ☐ Ovr EYB

Functional Obsol

Economic Obsol

Condition

Percent Complete

Depreciation Code

Remodel Rating 4: Remodel

Year Remodeled 2001

Override Value 500

203: WANDA

Section Summary

Group R11 Effective Area 3498

Base Rate 133.84 RCN \$658,500

Eff Base Rate \$161.67 Bldg % Good 86

Net Other Adj \$75,176.55 RCNLD \$500

Living Area/GBA 3000

Code	Description	Gross	Living	Eff Area
BAS	Main Building Area	1200	1200	1200
FBP	Basement, Finished, Partn	400	0	0
FGR	Garage, Attached	440	0	198

	Value	Type	Reason Code	Date	ID	Comment
% Good	Remove			Select a date	15	
Misc. Improve	Remove			Select a date	15	
Cost to Cure	Remove			Select a date	15	

Override Appraised Override Assessed cns_override_initial

Illustration 7

Obviously, a "Gut Rehab" would increase the value of property more than "Cosmetic" changes, and the coefficients listed in the above illustration demonstrate this. Our sample home was remodeled in 2001, indicating that the MV should be five percent. Five percent would be the correct amount if the remodel occurred in 2005, but it actually occurred in 2001, four years earlier. The CAMA model takes into consideration how long ago a remodel occurred and reduces its impact, as it becomes older. The rate of reduction of the MV is five percent per year. After twenty years, a remodel has no affect on value. In this example, our sample home's remodel occurred four years ago and thus the MV is reduced by twenty percent to 4.0% ($5\% \cdot .80$).

The last multiplicative variable, "Sub-Neighborhood Adj A", is the local neighborhood multiplier established within the particular neighborhood where the sample home is located. This variable is going to lower the RCN value of the sample home by 6.3%. The "Sub-Neighborhood Adj" reflects the market-derived fact that location is a very significant factor in the value of real estate. Two otherwise identical homes can have a substantial difference in value based on their locations.

The variables for our sample home are summarized in the Cost.dat file as follows:

```
*****Factor Adjustments*****
OVERALL CONDITION 4 (GOOD) = 1.091 x RCN
EXTERIOR CONDITION 4 (GOOD) = 1.091 x RCN
GRADE 40 (Above Average) = 1.090 x RCN
INTERIOR CONDITION 4 (GOOD) = 1.091 x RCN
```

REMODEL FACTOR 4 = 1.03500 x RCN
 SUB-NEIGHBORHOOD ADJ A = .878 x RCN

Each MV is multiplied together to determine the combined, or overall, MV. The sample home's MV is 1.2338132 (1.091*1.091*1.090*1.091*1.035*.878).

7. Finally, the Building RCN model is complete and contains the specific data of the sample home used in this demonstration. The market-derived cost model for the sample home is as follow:

$$\begin{aligned} \text{Building RCN} &= [(\text{Base Rate} + \sum \text{ABRV}_n) * \text{Effective Area} * \text{Size} \\ &\quad \$754,788 = [(\$157.85 + \$11.10) * 3,498 * .89128 \\ &\quad \text{Adjustment} + \sum \text{AFRV}_n] * (\text{MV}_0 * \text{MV}_2 * \dots * \text{MV}_n) \\ &\quad + \$60,070] * (1.2862809) \end{aligned}$$

The Cost.dat file shows a summary of the same information.

```
*****Building #1 Calc Start*****
Cost Calculation for pid, bid = 182803,173587
Account Number = 9999 9999
Use Code = 012
Cost Rate Group = R12
Model ID: R16

Section #1
Base Rate: 157.85
Size Adjustment: 0.89128
Effective Area: 3498
Adjusted Base Rate = (157.85 + 11.1) * 0.89128
Adjusted Base Rate: 150.58
RCN = ((150.58 * 3498) + 60070) * 1.2862802915416647
RCN: 754788
```

The replacement cost new for our sample home is \$754,188. There is still one thing left to address before we turn our attention to depreciation. Our sample home has a built-in sauna in the basement. This item was not costed as a component of the sample home, but rather as a Special Building Feature, with its own unit price of \$ 13,250. Also, note that the depreciation applied to the Special Building Features is identical to the amount applied to the main building. See illustration 6 below.

Parcel Information

SSL: 9999/ / / 9999/ / Primary Use: 012 Use Type: R1 Internal ID: 182803 Work In Prog 0 Living Area: 3000
 Location: 9999 9TH ST NW #99999999 Total Assess: \$920,160 Land Acres: 5,000 \$SF/ Liv/GBA: 306.72

Base Rate Values

Value Source C Living Area/GBA 3,000 RCN \$754,788 Regression 229220
 Prim Bldg Use 12 Effective Area 3,498 Bldg % Good 86.00 Income \$0
 Style 6 size Adjustment .89128 RCNLD \$649,120
 Bldg+XF RCN for All Bldgs \$2,629,919

Building #: 1 of 1

Special Building Features

Section	Code	Description	Sub Typ	Sub Type desc	Unit Type	Units	Unit Price	Year	Deprec Rate	Pct Good	Quality	RCN
1	SN	SAUNA	C	COUNT	Count	1	\$13,250.00	0	86	4		\$14,442.50

Add Extra Features Delete Extra Features

Primary Extra Feature Information

Section 1
 Code SN: SAUNA
 Sub Type C: COUNT
 Unit Price 13250
☒ Unit Price Override
 Unit Type Count
 Units 1
 Measure 1 1
 Measure 2
 Comment

Additional Extra Feature Information

Quantity
 Quality 4: Above Average
 Condition
 Year
 Effective Year 1950
☐ Effective Year Override
 Deprec Rate 0
 Percent Good 86
 Economic Obsol
 Functional Obsol
 Stories
 Basement

Value Override
☐ Appraised Value 12420 Assessed Value 12420

Illustration 8

We now know the total replacement cost new (RCN) of our sample home, including the sauna, is \$ 768,038 (\$754,788 + \$13,250).

If the sample home were brand new, we'd be finished, but it was actually built in 1937.

Next, we need to address accrued depreciation . . .

Depreciation

Depreciation is defined as a loss in the upper limits of value from all sources. Typically, three types of depreciation can affect real estate - physical deterioration, functional obsolescence and economic obsolescence. This next portion of the demonstration will illustrate how Vision[®] calculates the amount of depreciation accrued to our sample home.

Several terms come into use when discussing depreciation in CAMA. They are defined as follows:

- Actual Age: The mathematical difference between the Base Year and the actual year the improvement was built to completion.
- Actual Year Built (AYB): The earliest time the main portion of the building was built. It is not affected by subsequent construction.
- Base Year: The year, usually the current year, that the depreciation table is calibrated, such that the age of a building built during the base year would be 0 years old.
- Depreciation Table: A market-driven table that lists the amount of depreciation corresponding to an Effective Year Built and the Base Year predicated upon a specific economic life.
- Effective Age: The mathematical difference, in years, between the Base Year and the Effective Year Built.
- Effective Year Built (EYB): The calculated or apparent year, that an improvement was built that is most often more recent than AYB. The EYB is determined by the condition and quality of the improvement. Subsequent renovation, additions, upgrades and the like, extend an improvements remaining economic life and therefore cause the EYB to be closer to the Base Year than the AYB.
- Percent Good: The mathematical difference between 100 percent and the percent of depreciation. $(100\% - \text{depreciation } \%) = \text{percent good}$

The RCN model used above indicated that our sample home has an RNC of \$768,038. As stated earlier, the home was built in 1937 so there should be some depreciation to deduct from the RCN. We'll use a five-step process to depreciate improvements:

1. Calculate the Actual Age of the improvement
2. Determine the Effective Age of the improvement
3. Determine the improvement's Effective Year Built
4. Look-up Percent Good corresponding to EYB on depreciation table
5. Apply selected depreciation to RCN to determine RCNLD

1. Our first step is to calculate the Actual Age of our sample home. As you are aware, a valuation is always qualified as of a specific date. For ad valorem purposes in the District of Columbia, the valuation date is January 1 immediately preceding the tax year. In our example, the tax year is 2007; therefore, the valuation date is January 1, 2006. This date is also significant in terms of the depreciation accrued to improvements. In the past, the nature of triennial assessments required that base years within a Tri-Group remain unchanged for a period of three years. Now, however, with the return to annual assessments, the base year coincides with the valuation date. The Base Year is used to determine the Actual Age of the sample home. In this case, the sample home's Actual Age is 69 years (2006-1937).

2. The next step is to determine the sample home's Effective Age. Effective Age may or may not represent actual or chronological age. The premise is simple but the application can be confusing. If a home is built and never maintained (painting, re-roof, etc.) or remodeled, the home would quickly depreciate from physical deterioration. The CAMA system would depreciate the home at the fastest rate possible based on the selected Depreciation Table. For example, CAMA uses a 75-year Economic Life Depreciation Table for residential property. If the home were left to rot, the Effective Age would most likely be the same as the Actual Age.

Let's say the owners of our sample home have completely neglected their property from the time it was built in 1937 to the present. Their home would have an effective age of 78 years as indicated on the Depreciation Table below:

Depreciation Table							
Base Year							
2015							
Effective Age of Building	% Depr.	% Good	Effective Year Built				
0	0	100	2015	54	13	87	1961
1	1	99	2014	55	13	87	1960
2	2	98	2013	56	13	87	1959
3	2	98	2012	57	13	87	1958
4	3	97	2011	58	13	87	1957
5	3	97	2010	59	13	87	1956
6	4	96	2009	60	14	86	1955
7	4	96	2008	61	14	86	1954
8	4	96	2007	62	14	86	1953
9	4	96	2006	63	14	86	1952
10	5	95	2005	64	14	86	1951
11	5	95	2004	65	14	86	1950
12	5	95	2003	70	15	85	1945
13	5	95	2002	75	16	84	1940
14	6	94	2001	78	16	84	1937

Illustration 1

The Actual Year Built (1937) and the Effective Year Built (1937) would be the same and consequently the Effective Age is 70 years. Moving across the table, we see that a home with an EYB of 1937 has 15 percent depreciation and therefore is 85 Percent Good (100%-15%). If the RCN of our sample home is \$ 754,788, the depreciated value, RCNLD, is only \$ 641,570 ($754,788 * 0.85$).

Note: The depreciation table moves in 5-year periods towards its end; this explains the apparent inconsistencies in 70 years v. 69 years. The Cost.dat file represents the actual numbers used in calculations.

The situation described above rarely, if ever, occurs in the market. People do maintain and renovate their homes and in doing so, extend the home's useful or remaining economic life. As homeowners repair roofs, paint siding, replace windows and furnaces, they *prolong* the life of the home and consequently *decrease* its Effective Age.

Along with the actual age of the sample home, the illustration below shows which variables within CAMA affect the calculation of effective year built.

The screenshot displays the CAMA software interface with the following sections:

- Parcel Information:**
 - SSL: 9999 / / 9999 / / Primary Use: 012 Use Type: R1 Internal ID: 182803 Work In Prog: 0 Living Area: 3000
 - Location: 9999 9TH ST NW #999999999 Total Assess: \$920,160 Land Acres: 5,000 \$SF/ Liv/GBA: 306.72
- Base Rate Values:**
 - Value Source C: Living Area/GBA 3,000 RCN \$754,788 Regression 229220
 - Prim Bldg Use 12: Effective Area 3,498 Bldg % Good 86.00 Income \$0
 - Style 6: size Adjustment .89128 RCNLD \$649,120
 - Bldg+XF RCN for All Bldgs \$1,278,094
- Building #:** 1 of 1
- Section:** 1 of 1
- Style:** 6: 2.5 Story Fin
- Model:** 01: Single Family
- Grade:** 4: Above Average (highlighted)
- Overall Cndtn:** 4: Good (highlighted)
- Stories:** 2.5
- Park Spaces:** 0
- Foundation:** 2: Average
- Exterior Wall:** 15: Face Brick
- Exterior Condtn:** 4: Good (highlighted)
- Building Type:** 1: Single
- Roof Cover:** 3: Shingle
- Floor Cover:** 11: Hardwood/Carp
- Interior Condition:** 4: Good (highlighted)
- View:** 3: Average
- No. Units:** 1
- Heat Type:** 1: Forced Air
- Eat in Kith:** 0: Default
- AC Type:** Y: Yes
- Bedrooms:** 4
- Bathrooms:** 2
- Half Baths:** 2
- Total Rooms:** 8
- Bath Style:** 2: Semi-Modern
- Kitchen Style:** 2: Semi-Modern
- Kitchens:** 1
- Fireplaces:** 1

Illustration 2

All of the features or variables dealing with depreciation, highlighted in Illustration 2 are multiplicative variables. As such, they are multiplied one by the other and then the Actual Age is multiplied by the product of the MVs. Below is the portion of the Cost.dat file that summaries these MV for our sample home.

```

*****Effective Age Adjustments*****
BATH STYLE 2 (Semi-Modern) = .95 * Age
EFF AGE GRADE 40 (Good Quality) = .95 * Age
KITCHEN STYLE 2 (Semi-Modern) = .9 * Age

```

The product of each of these MV adjustments is calculated to be 0.81225 ($0.95 * 0.95 * 0.9$). This product is then multiplied by the Actual Age to calculate the Effective Age. Recall our sample home's Actual Age is 78 years. The Effective Age is calculated to be 61 years ($78 * 0.81225$). Instead of CAMA using 78 chronological years to calculate depreciation, it will use 61 years. Below is a portion of the Cost.dat file that shows these calculations.

```

*****
Actual Year Built: 1937
Effective Age = 75 * .81225
Effective Age: 61
Percent Good = 86
RCNLD: 649120

```

3. We're almost finished. Knowing the Effective Age makes the calculation of the Effective Year Built for our sample home very simple. The Effective Year Built is 1950 ($2006 - 56$).

4. Having established the Effective Year Built, we look up 1950 on the *75-Year Economic Life Depreciation Table* and find that the Percent Good is 87% for that year. See Illustration 3 below.

Depreciation Table							
Base Year							
2015							
Effective Age of Building	% Depr.	% Good	Effective Year Built				
0	0	100	2015	46	11	89	1969
1	1	99	2014	47	12	88	1968
2	2	98	2013	48	12	88	1967
3	2	98	2012	49	12	88	1966
4	3	97	2011	50	12	88	1965
5	3	97	2010	51	12	88	1964
6	4	96	2009	52	12	88	1963
7	4	96	2008	53	12	88	1962
8	4	96	2007	54	13	87	1961
9	4	96	2006	55	13	87	1960
10	5	95	2005	56	13	87	1959
11	5	95	2004	57	13	87	1958
12	5	95	2003	58	13	87	1957
13	5	95	2002	59	13	87	1956
14	6	94	2001	60	14	86	1955
15	6	94	2000	61	14	86	1954
16	6	94	1999	62	14	86	1953
17	6	94	1998	63	14	86	1952
18	6	94	1997				

Illustration 3

5. The last step in the process is to simply multiple the RCN by 0.87 and we have RCN LD. The depreciated, market-derived cost approach value of the sample home used in this demonstration is \$ 641,570.

Some closing comments regarding depreciation are in order. Recall from the outset that we defined depreciation as a loss in value resulting from physical deterioration, functional and/or economic obsolescence. The demonstration above dealt only with depreciation attributed to the physical deterioration of the sample home. This, by far, is the most common type of depreciation that exists in residential property. However, occasions may require additional depreciation because of excessive physical deterioration, functional and/or economic obsolescence. One must use caution when invoking these types of depreciation. The market must support any decision regarding the extent of these adjustments. Below illustrates our sample home with an additional ten percent economic obsolescence. A gas station was built across the street from the home, and a recent sale of the next-door neighbor's house showed the impact of this situation.

Base Rate Values

Value Source C	Living Area/GBA 3,000	RCN \$754,788	Regression 229220
Prim Bldg Use 12	Effective Area 3,498	Bldg % Good 86.00	Income \$0
Style 6	size Adjustment .89128	RCNLD \$649,120	
Bldg+XF RCN for All Bldgs \$1,278,094			

Building #: 1 of 1 Section: 1 of 1

Section Level Depreciation

Year Built: 1937
Effective Year Built: 1954 ☐ Ovr EYB
Functional Obsol:
Economic Obsol:
Condition:
Percent Complete: 100
Depreciation Code:
Remodel Rating: 4: Remodel
Year Remodeled: 2001
Override Value:
Override Initials: 239: ROBERT

Section Summary

Group	R12	Effective Area	3498
Base Rate	157.85	RCN	\$754,788
Eff Base Rate	\$193.69	Bldg % Good	86
Net Other Adj	\$77,266.86	RCNLD	\$649,120
Living Area/GBA	3000		

Code	Description	Gross	Living	Eff Area
BAS	Main Building Area	1200	1200	1200
FBP	Basement, Finished, Partn	400	0	0
FGR	Garage, Attached	440	0	198

	Value	Type	Reason Code	Date	ID	Comment
% Good	Remove			Select a date	15	
Misc. Improve	Remove			Select a date	15	
Cost to Cure	Remove			Select a date	15	

Override Appraised:
Override Assessed:
cns_override_initial:

Illustration 4

The actual mechanics of adjusting depreciation for functional or economic obsolescence within CAMA are briefly discussed below. If the situation occurs, seek guidance from your supervisor and/or CAMA manager.

Illustration 5 shows the portion of the CAMA screen used to allow for additional depreciation. It is not necessary to make adjustments in the “CDU” field or to override the EYB field. The “Status” and “Percent Complete” fields are the only two fields that are utilized to account for additional depreciation.

Section Level Depreciation

Year Built: 1937
Effective Year Built: 1954 ☐ Ovr EYB
Functional Obsol:
Economic Obsol:
Condition:
Percent Complete:
Depreciation Code:
Remodel Rating: 4: Remodel
Year Remodeled: 2001
Override Value:
Override Initials: 239: ROBERT

Section Summary

Group	R12	Effective Area	3498
Base Rate	157.85	RCN	\$754,788
Eff Base Rate	\$193.69	Bldg % Good	86
Net Other Adj	\$77,266.86	RCNLD	\$649,120
Living Area/GBA	3000		

Code	Description	Gross	Living	Eff Area
BAS	Main Building Area	1200	1200	1200
FBP	Basement, Finished, Partn	400	0	0
FGR	Garage, Attached	440	0	198

	Value	Type	Reason Code	Date	ID	Comment
% Good	Remove			Select a date	15	
Misc. Improve	Remove			Select a date	15	
Cost to Cure	Remove			Select a date	15	

Override Appraised:
Override Assessed:
cns_override_initial:

Illustration 5

The “Condition” field’s pick-list is similar to Illustration 6 shows items that have a direct affect on depreciation and the nature of the affect. Notice that a reduced number of Condition Codes are functional within CAMA and their affect on depreciation is either to **replace** the existing amount in the “% Good” field or **decrease** the “% Good.” The corresponding numeric amount that will affect the “% Good” is entered in the field called “Percent Complete.” Please note that the field name “Percent Complete” is somewhat erroneous because the word “Complete” has no meaning in this context. This is the field that you will enter the

amount to either decrease the existing “% Good” or replace the existing “% Good,” based on the Status Code selected.

Status

Status Codes		
Code	Description	Affect on % Good
0	Default	NONE
A	Abandoned/Boarded	NONE
B	Burned Out	NONE
C	Commercial New Const	REPLACE
E	Economic Dep	DECREASE
F	Functional Dep	DECREASE
G	Gut Rehab	NONE
H	Data Change	NONE
L	Limited Equity	NONE
M	Demolition	NONE
N	N/A	NONE
NO	Normal	NONE
OV	Overall Depreciation	REPLACE
P	Physical Depr	DECREASE
PA	Partial Abandon	NONE
R	Renovation	NONE
T	Order of Taking	NONE
V	Vacant	NONE

Illustration 6

Recall our example of the gas station. The Percent Complete field has “10” as it’s value. Based on the “E” Status Code, we know that the original depreciation will increase by ten percent resulting in a decrease in Percent Good to 77% (87-10).

Another comment regarding depreciation concerns the impact that the quality of design, material and workmanship have on depreciation. The grade assigned to a home obviously makes a considerable difference in the final RCN, but it also plays a substantial part in determining the amount of depreciation accrued to the home. It is easy to understand that if all other things were equal, a home built with better material and workmanship would age better than one with poorer materials and workmanship. The higher quality the home the more slowly it will deteriorate. Conversely, a shoddily built home will age more quickly than the average home.

Lot Valuation

Now that we've calculated RCN in the first section and the amount of depreciation in the second section, we know the value of our improvements from the formula RCN-LD to be \$639,030.

Next let's turn our attention to the final portion of the process – land or lot valuation. There are several aspects or characteristics to land that affect its value. Needless to say the old adage “Location, Location, Location!” is certainly true, but beyond that there are considerations for such things as lot size, shape, frontage, topography, view, restrictions and the like that influence the final value of land.

Let's once again return to our sample home and examine the details on the PRC to get our first look at the lot valuation.

The screenshot shows a software window titled "Land Details" with a close button (X) in the top right corner. The form is organized into several sections:

- Building & Line Num:** Two input fields, both containing the number "1".
- Land Type (Site):** A dropdown menu showing "P: Prima" and an empty text field.
- Use Code:** A dropdown menu showing "012: Residential Detach".
- Lot Type:** A dropdown menu showing "1: 1".
- Zoning:** A text field containing "R-5-E".
- Unit Price:** A text field containing "76.41".
- District:** An empty text field.
- Land Type Adj (f):** A text field containing "1.00000000".
- Frontage:** A text field containing "40".
- Site Adj.:** A text field containing "1.00".
- Depth:** A text field containing "150".
- Neighborhood:** A dropdown menu.
- Land Units:** A text field containing "6000".
- Nhbd. Adj.:** A text field containing "1.000".
- Unit Type:** A dropdown menu showing "SF: Square Feet".
- SIZE ADJ:** A text field containing "1.0000".
- Special Calcs:** A dropdown menu.
- Notes:** A text area containing "Poor topo in back; River view".
- Adjustments (Special):** A dropdown menu showing "V: View", followed by two input fields containing "0" and "80", and a percentage sign "%".
- Override Options:** Two checkboxes, both unchecked: "Override Appraised Land Value" and "Override Assessed Land Value".
- Totals:** A section with two input fields: "Appraised" containing "458460" and "Assessed" containing "366770".
- Buttons:** Four buttons at the bottom: "Next", "Add", "Delete", and "Close".

Illustration 1

Notice that the detail tells us the lot size, the price per unit, and any adjustments that affect the lot. The model used to calculate the value of lots in CAMA is as follows:

$$\text{Lot Value} = [\text{Lot Size} * ((\text{Base Rate} * \text{Size Adjustment}) + \sum \text{Dollar Adjustments}) * \sum \text{Percent Adjustments}]$$

The formula represents the following steps:

1. *Determine the base rate for the particular neighborhood where the lot is located and multiply that rate by the ‘size adjustment factor’;*
2. *Next, add the adjusted rate in step one to the sum of all dollar amount adjustments;*
3. *Next, multiply the results by the lot size;*
4. *Lastly, multiply that result by the product of all percentage adjustments.*

Most of this activity can be seen in the Land.Dat file in Appendix A of this document. You may wish to refer to it as we go through this exercise.

Let’s expand the discussion and follow the steps of the process to explain the lot valuation of our sample home in more detail.

1. *“Determine the base rate for the particular neighborhood where the lot is located and multiply that rate by the ‘size adjustment factor’.”*

The residential base land rates are different for each (sub)neighborhood in the District. Each year, the current base rates are updated in CAMA and published in the *Assessor Reference Materials*. In addition to the base rates, the base lot sizes and size curves are included. Our property is located in Chevy Chase, and below shows the portion of the land rate table for that neighborhood:

NBHD	Base Lot Size	Base Rate	Base Lot Value	Size Curve
11 A	5,000 sf	\$89.00	\$445,000	LG 1

Illustration 2

The base rate for our property is \$ 89.00 per sf.

The size adjustment factors are also incorporated in CAMA. These factors make allowances for lots whose sizes differ from the standard “base” size for the lots in that particular (sub)neighborhood. Recall that as the size or area of a building or lot increases, the dollar rate per unit typically goes down from the base rate, and conversely, the dollar rate typically increases over the base rate when the area or size is smaller than the standard base rate.

Recall that our lot is 6,000 sf in size. The table states that the Base Lot Size is 5,000, so a size adjustment will be necessary. Intuitively, one would expect that the size adjustment would be less than 100% because the actual lot is larger than the base size lot. CAMA contains the algorithms to calculate the proper size adjustment. Essentially, it determines which “land size curve” is to be used as the basis for determining the adjustment, then it mathematically interpolates and extrapolates the factor from the particular size table associated with the curve based on the amount of difference between the standard size and the actual size.

In the case of our sample home, the size curve is LG 1. This curve is one of the four curves existing in CAMA and its effect on rates is the lowest of the curves.

Based on the difference between the base size and the actual size of the lot, CAMA has selected a factor of 0.8585 as the adjustment. If the lot were smaller, say 4,000, sf the selected factor would have been 1.198.

So, to finish step 1, we multiply the (sub)neighborhood base land rate by the calculated size adjustment factor to arrive at a size adjusted rate of \$ 76.41 ($\$89.00 * 0.8585$).

2. *“Next, add the adjusted rate in step one to the sum of all dollar amount adjustments.”*

If there are any dollar-amount adjustments to the rate, this is the time to make the them. For example, you may choose to lower the rate by \$10 per sf on a particular lot in a neighborhood because it is on a busy street corner. In our example, the rate is increased by \$15 per sf because the property has an excellent view of the river not enjoyed by the other lots in the neighborhood. This adjustment increases the rate to \$91.41 ($\$76.41 + \15.00).

Use caution when making any adjustments to the calculated rates. If adjustments are warranted, seek guidance from your supervisor or CAMA manager.

3. *“Next, multiply the resulting rate by the lot size.”*

This is an easy step. The land value at this point is \$458,460 ($\$76.41 * 6,000$).

4. *“Lastly, multiply that result by the product of all percentage adjustments.”*

As before, here’s where we can reflect adjustment to the lot for such things as topography, view, shape irregularity, and the like. There may be an easement across the back of the lot that affects value. Again be certain that the adjustment is peculiar to just the subject or a few lots in the (sub)neighborhood, otherwise the condition would have been already accounted for in the calculations done by the multiple regression analysis process that generated the original base rates, size curves and standard lot sizes.

Our sample lot had a steep drop-off across the back that the assessor accounted for by adjusting the final rate by 80 percent. This is the last calculation to determine the subject property’s lot value. The final value of our lot is \$ 366,768 ($458,460 * 0.80$).

The illustrations below summarize much of the information discussed in this land valuation exercise. Illustration 3 shows a portion of the data entry screen in Vision[®] CAMA and the second, illustration 4, is the Land.dat file with selected information highlighted.

Parcel Information

SSL: 9999/ / 9999 Primary L 012 Use Type R1 Internal I 182803 Work In f 0 Living An 3000

Location: 9999 9TH ST NW #999 Total Ass \$1,197,930 Land Acr 6,000 \$SF/ Liv/K 399.31

Property Factors

Topography 1: Level Front 1: 0: Default Alley 1: 2: No Landscape 1: 0: Default

Topography 2: Front 2: Alley 2: Landscape 2: Site Adj: 1.00

Topography 3: Front 3: Alley 3: Landscape 3: Size Adj: 1.0000

Land Valuation Neighborhoods

Res NBHD 11 Sub NBHD A GIS Region Lot Factors

Comm NBHD 11 Sub NBHD A Pocket NBHD Frontage 0 Depth 0 GIS Area 0

Z Contour Sec Frontage 0 Perimeter 0 Gis Perimeter 0

Num Frontage 0 Lot Type

Building Classification and Land Line Valuation

Bldg #	Line #	Code	Description	Units	Unit type	Appraised	Assessed	Acre Discount	Zone	Land Type	Land
1	1	012	Residential Detached	6,000	SF	\$458,460.00	\$366,770.00		1	0	0

Land Acres .13774105 Appraised \$458,460.00

Mix Use

012 Residential Detached Single Fa 100 R

Edit Lines

Land Details

Building 1 Line Num 1

Use Code al Detached Single Fa Lot Type 1:1 Land Type (Site P: Prima

Zoning R-S-E Unit Price 76.41

District Land Type Adj 0 1.00000000

Frontage 40 Site Adj: 1.00

Depth 150 Neighborhood

Land Units 6000 Nhd. Adj: 1.000

Unit Type SF: Square Feet SIZE ADJ 1.0000

Special Calcs

Notes Poor topo in back; River view

Adjustments (Special V: View 0 80 %

Override Appraised Land Value

Override Assessed Land Value

Totals

Appraised 458460 Assessed 366770

Next Add Delete Close

Illustration 3

REPORT GENERATED ON 26-Feb-2015 AT 08:36

Account Number = 9999 9999

Use Code = 012

Recalc Land for PID 182803

Recalc Land for Bldg Num 1 on land line 1

Check for any special use value overrides

Land Use Code = 012

Special Use Value = 0.00

Special Use Percent = 80.00

Base District = 11

Neighborhood 11A

Find the region for a group and district

Land Group = R

Region = District, Region not defined

From Land Rate Table

Base Sub District = A

Z Contour =

District Standard Size = 5000

District Base Price Size = 89.00

District Size Adjustment = LG1

Land group based Value Source = C

Size Ratio = 6000.000 / 5000 * 10000

Size Ratio = 12000.000

Internal calculations to arrive at adjustments for non-standard base size

Interpolate/Extrapolate from size adj curve table

High Unit Size = 120.00

High Factor = 0.8585

Base rate multiplied by size adjustment (89.00 *.8585)

District pricing based unit_type value = 76.41

Total adjustment a = 1 * 1.000 * 1.00 * 1 * 1

Total adjustment a = 1.00000

Land Value = 76.41 * 6000.000

Final adjusted rate * lot size = land Value

Land Value Rounded = 458460

Illustration 4

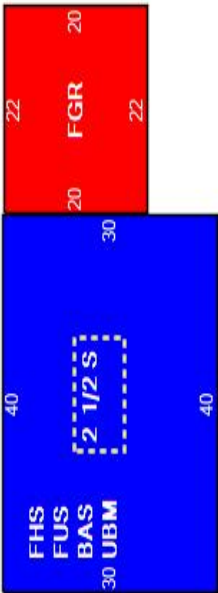
Some Final Thoughts

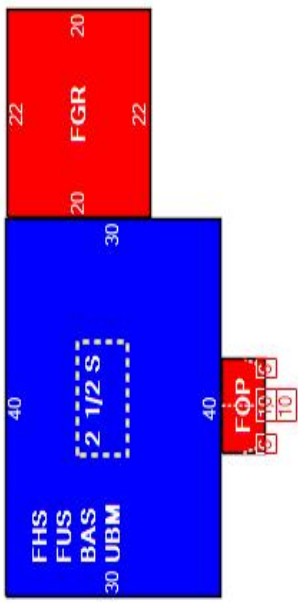
We have introduced you to some of the most elementary aspects of property valuation using the District's Vision® CAMA system. We have developed the RCN of a fictitious home, reduced its value by the accrued depreciation and finally added the land value component to complete the appraisal. This guideline is merely a small window, a first step, in the complex field of CAMA mass appraisal. A CAMA system robust enough to appraise 180,000 different properties will necessarily be comprehensive and complex. As you explore and utilize the program make certain that you fully understand the ramifications and results of your actions. Your supervisor and/or CAMA manager will always be available to assist you.

Appendix A

1. Property Record Card, SSL 9999 9999
2. Cost.dat print-out, SSL 9999 9999
3. Land.dat print-out, SSL 9999 9999
4. 2018 CAMA Construction Valuation Guideline – Residential

CURRENT OWNER				ACCOUNT INFORMATION				CURRENT ASSESSMENT											
Washington		DC		12345		Use Type	Use Code	Lot SF	Status Code	RES LAND	Code	Assessed Val	RES						
						R1	012	6,000	A	RESIDENTL	012	366,770							
						VISIT / CHANGE HISTORY			RESIDENTL	012	661,540								
						Date	ID	Type	Inf. Source	Code	Description								
				11-13-2014	203	C	O	R	Revaluation										
				06-18-2014	203	O	B	B	Sale Verification & Permit										
				03-04-2013	203	C	O	B	Sale Verification & Permit										
				09-14-2012	203	O	O	R	Revaluation										
				01-01-2012	379	P	N	R	Revaluation										
				09-12-2006	203	M	O	B	Sale Verification & Permit										
OWNERSHIP HISTORY				INSTRUMENT #		SALE DATE		q/u	v/i	SALE PRICE		AC	PREVIOUS ASSESSMENTS (HISTORY)						
JANEY TAXREP JOSEPH TAXPAYER				1111/2222 123456		12-31-2011 02-29-2000		Q	I	575,000 654,321		01 01	Year	Use	Type	Val Source	Land Value	Building Value	Assess Value
													2016	012	R1	C	366,770	831,160	1,197,930
													2015	011		O		82,120	2,378,750
													2014	011	R1	C	67,480	2,340,370	2,407,850
													2013	024	R3	C	287,330	1,632,500	1,919,830
2012	012	R1	C		278,210	693,980	972,190												
				APPEALS				PROPERTY FACTORS											
Appeal #		Decision		Amount		Revised AV		TOPOGRAPHY		MLT FRONT		ALLEY ACCESS		LANDSCAPE					
								1	Level	0	Default	2	No	0	Default				
COMMENTS																			
THIS IS A NOTE ABOUT THIS HOUSE																			
VALUE SUMMARY																			
				Regress (L&B)				Cost (L&B)											
				0				1,289,620											
				Factor/Value		Type	Reason	Date	ID										
Value Adjust.																			
Override																			
Comment																			
DATA ENTRY																			
Entry Date:								Entry ID:											
LAND LINE VALUATION SECTION																			
B #	Occ	Description	Zone	Frontage	Depth	Units	SI	I. Factor	LT	Price	Size Adj	Site Rating	Adjustments/Special Use	Notes	Land Value				
1	012	Residential Detached Single F	R-5-E	40	150	6000.0	SF	P	1.000000	0	76.41	1.0000	V	80.00	Poor topo in back; River vi	458,460			
47																			
Total Land Units																			
6,000 (SF)																			
Total Land Value																			

CONSTRUCTION DETAIL				BUILDING SUMMARY SECTION					SKETCH
Element	Cd	Chng	Description	Code	Description	Gross	Eff Area	Living	<div><div>FBP (400 sf)</div></div>
Prim Bldg Use	012		Residential Detached	BAS		1,200	1,200	1,200	
Model	01		Single Family	FBP		400	0	0	
Grade	4		Above Average	FGR		440	198	0	
Style	6		2.5 Story Fin	FHS		1,200	600	600	
Stories:	2.5			FOP		60	0	0	
Building Type:	1		Single	FUS		1,200	1,200	1,200	
Roof Cover:	3		Shingle	UBM		1,200	300	0	
Foundation	2		Average						
Exterior Wall	15		Face Brick		Total:	5,700	3,498	3,000	
Exterior Condt	4		Good		BUILDING COST				
Heat Type	1		Forced Air		Effective Area				
AC Type	Y		Yes		Building RCN				
Floor Cover	11		Hardwood/Carp		Spec. Feature RCN				
Interior Condti	4		Good		Total RCN				
Total Rooms	8				% Good				
Fireplaces	1				Building Cost				
Bedrooms	4				DEPRECIATION				
Bathrooms	2				Current				
Half Baths	2				Change				
Bath Style	2		Semi-Modern		012				
Kitchens	1				1937				
Kitchen Style	2		Semi-Modern		2001				
Eat in Kith	0		Default		1954				
Overall Cndtn	4		Good						
View	3		Average						
Park Spaces	0								
No. Units	1								



FBP
(400 sf)

OUTPUT FROM NEW COST MODELING ENGINE
REPORT GENERATED ON 27-Feb-2015 AT 08:28

*****Building #1 Calc Start*****

Cost Calculation for pid, bid = 182803, 173587

Account Number = 9999 9999

Use Code = 012

Cost Rate Group = R12

Model ID: = R16

Section #1

Section Use: Residential Detached Single Fa

Base Rate: 157.85

Size Adjustment: 0.89128

Effective Area: 3498

Adjusted Base Rate = $(157.85 + 11.100000) \times 0.89128$

Adjusted Base Rate: 150.58

RCN = $((150.58 \times 3498 + 60070.000000000) \times 1.286280291541664700000000000000) + 0$

RCN: 754788

*****Base Rate Adjustments*****

EXTERIOR WALL 15 = 3.950 + BaseRate

ROOF COVER 3 = 0.680000 + BaseRate

FLOOR COVER 11 = 4.670 + BaseRate

AIR CONDITIONING Y = 1.800 + BaseRate

*****Units Value Additions*****

FULL BATHS OVER 1 = 12500.000 + RCN

HALF BATHS = 16250.000 + RCN

FIREPLACES = 8000.000 + RCN

PARTITIONED FINISHED BASEMENT = 22000.000 + RCN

OPEN PORCH = 1320.000 + RCN

*****Factor Adjustments*****

GRADE 4 = 1.090 x RCN

INTERIOR CONDITION 4 = 1.091 x RCN

EXTERIOR CONDITION 4 = 1.091 x RCN

OVERALL CONDITION 4 = 1.091 x RCN

REMODEL FACTOR 4 = 1.035000000000 x RCN

SUB-NEIGHBORHOOD ADJ A = 0.878000 x RCN

*****Effective Age Adjustments*****

EFF AGE GRADE 4 = 0.950 x Age

BATH STYLE 2 = 0.950 x Age

KITCHEN STYLE 2 = 0.900 x Age

Actual Year Built: 1937

Effective Age = 61

Percent Good = 86

RCNLD: 649120

REPORT GENERATED ON 27-Feb-2015 AT 08:29

Account Number = 9999 9999

Use Code = 012

Recalc Land for PID 182803

Recalc Land for Bldg Num 1 on land line 1

Check for any special use value overrides

Land Use Code = 012

Special Use Value = 0.00

Special Use Percent = 80.00

Base District = 11

Find the region for a group and district

Land Group = R

Region = District, Region not defined

Base Sub District = A

Z Contour =

District Standard Size = 5000

District Base Price Size = 89.00

District Size Adjustment = LG1

Land group based Value Source = C

Size Ratio = $6000.000 / 5000 * 10000$

Size Ratio = 12000.000

Interpolate/Extrapolate from size adj curve table

High Unit Size = 120.00

High Factor = 0.8585

District pricing based unit_type value = 76.41

Total adjustment a = $1 * 1.000 * 1.00 * 1 * 1$

Total adjustment a = 1.00000

Land Value = $76.41 * 6000.000$

Land Value Rounded = 458460

2018 CAMA Residential Construction Valuation Guideline -- RPAD

USECODE

(Selects Base Rate)

No.	Description	Value
011	Row	\$137.12
012	Detached	\$158.38
013	Semi-Detached	\$138.41
015	Mixed Use	\$137.12
019	Miscellaneous	\$137.12
023	Small Apt. Bldg.	\$112.25
024	Conversion	\$143.42

CONSTRUCTION DETAIL

No.	Description	Value
-----	-------------	-------

Style (Descriptive)

1	1 Story
2	1.5 Story Unfin
3	1.5 Story Fin
4	2 Story
5	2.5 Story Unfin
6	2.5 Story Fin
7	3 Story
8	3.5 Story Unfin
9	3.5 Story Fin
10	4 Story
11	4.5 Story Unfin
12	4.5 Story Fin
13	Bi-Level
14	Split Level
15	Split Foyer

Foundation (Descriptive)

0	No Data
4	Pier
5	Wood
6	Concrete

View (Descriptive)

0	Typical
1	Poor
2	Fair
3	Average
4	Good
5	Very Good
6	Excellent

Building Type (Descriptive)

0	Default	
1	Single	
2	Multi	
6	Row End	\$2.50
7	Row Inside	
8	Semi-Detached	

Roof (Add to Base Rate)

0	Typical	
1	Comp Shingle	
2	Built Up	
3	Shingle	\$0.68
4	Shake	\$0.79
5	Metal-Pre	\$0.50
6	Metal Sms	\$0.50
7	Metal-Cpr	\$0.50
8	Composition Roll	-\$0.43
9	Concrete Tile	\$1.88
10	Clay Tile	\$2.93
11	Slate	\$2.86
12	Concrete	\$1.88
13	Neoprene	\$0.00
15	Wood- FS	\$0.68

Exterior Finish (Add to Base Rate)

0	Default	
1	Plywood	
2	Hardboard Lap	
3	Metal Siding	
4	Vinyl Siding	
5	Stucco	
6	Wood Siding	
7	Shingle	
8	SPlaster	
9	Rustic Log	
10	Brick Veneer	\$3.95
11	Stone Veneer	\$9.38
12	Concrete Block	
13	Stucco Block	
14	Common Brick	\$3.95
15	Face Brick	\$3.95
16	Adobe	
17	Stone	\$9.38
18	Concrete	\$3.95
19	Aluminum	
20	Brick/Stone	\$6.67
21	Brick/Stucco	\$1.98
22	Brick/Siding	\$1.98
23	Stone/Stucco	\$4.69
24	Stone/Siding	\$4.69

Heat Type (Add to Base Rate)

0	No Data	
1	Forced Air	
2	Air-Oil	\$0.55
3	Wall Furnace	-\$1.27
4	Electric Rad	-\$0.29
5	Elec Base Brd	-\$0.20
6	Water Base Brd	\$1.42
7	Warm Cool	
8	Ht Pump	
9	Evp Cool	
10	Air Exchng	
11	Gravity Furnace	
12	Ind Unit	
13	Hot Water Rad	

AC Type (Add to Base Rate)

0	Default	
N	No	
Y	Yes	\$1.80

Floor Covering (Add to Base Rate)

0	Default	\$2.50
1	Resilient	\$2.63
2	Carpet	\$2.17
3	Wood Floor	\$6.06
4	Ceramic Tile	\$8.53
5	Terrazzo	\$8.30
6	Hardwood	\$7.17
7	Parquet	\$8.15
8	Vinyl Comp	\$1.64
9	Vinyl Sheet	\$2.86
10	Lt Concrete	\$0.75
11	Hardwood/Carp	\$4.67

Per Unit Adjustment (Flat Rate Add)

Full Bath (over 1)	\$12,500
Half Bath	\$ 7,500
Fireplace	\$ 8,500
Kitchen	\$11,500
Finished Basement (Basic)	\$22.00/sf
Finished Basement (Partition)	\$59.00/sf
Basement Garage	\$55.00/sf
Carport	\$33.00/sf
Stoop	\$22.00/sf
Open Porch	\$22.00/sf
Covered Open Porch	\$38.50/sf

Screen Enclosed Porch	\$41.25/sf
Glass Enclosed Porch	\$46.75/sf
Fully Enclosed Porch	\$55.00/sf
Deck	\$24.75/sf
Patio	\$ 8.25/sf

Grade (Multiplies Base, Add & Flat)

0	Default	
1	Low Quality	0.50
2	Fair Quality	0.75
3	Average Quality	1.00
4	Above Average Quality	1.08
5	Good Quality	1.18
6	Very Good Quality	1.30
7	Excellent Quality	1.45
8	Superior Quality	1.68
9	Extraordinary – A	1.95
10	Extraordinary – B	2.15
11	Extraordinary – C	2.55
12	Extraordinary – D	2.90

Interior Condition (Multiplies Base, Add & Flat)

0	Typical	
1	Poor	.794
2	Fair	.843
3	Average	1.000
4	Good	1.089
5	Very Good	1.182
6	Excellent	1.239

Exterior Condition (Multiplies Base, Add & Flat)

0	Default	
1	Poor	.794
2	Fair	.843
3	Average	1.000
4	Good	1.089
5	Very Good	1.182
6	Excellent	1.239

Overall Condition (Multiplies Base, Add & Flat)

0	Default	
1	Poor	.794
2	Fair	.843
3	Average	1.000
4	Good	1.089
5	Very Good	1.182
6	Excellent	1.239

Remodel Type (Multiplies Base, Add & Flat)

0	Default	
1	Unknown	
2	Gut Rehab	1.43
3	Major Renov	1.26
4	Remodel	1.08
5	Addition	
6	Cosmetic	1.02

The effect of this multiplier diminishes at a rate of 5% per year based on the **Remodel Year**.

2018 CAMA Residential Construction Valuation Guideline -- RPAD

DEPRECIATION DETAIL

No. Description Value

Grade (Adjust EYB)

0	Default	
1	Low Quality	20%
2	Fair Quality	10%
3	Average Quality	--
4	Above Average	-05%
5	Good Quality	-10%
6	Very Good Quality	-15%
7	Excellent Quality	-25%
8	Superior Quality	-35%
9	Extraordinary – A	-45%
10	Extraordinary – B	-50%
11	Extraordinary – C	-50%
12	Extraordinary – D	-50%

Bath Style (Adjust EYB)

0	Default	
1	No Remodeling	
2	Semi-Modern	- 05%
3	Modern	- 10%
4	Luxury	- 20%

Kitchen Style (Adjust EYB)

0	Default	
1	No Remodeling	
2	Semi-Modern	- 10%
3	Modern	- 20%
4	Luxury	- 40%

Building RCN = [(Base Rate + \sum ABRV_n) * Effective Area * Size Adjustment + \sum AFRV_n] * (MV₀ * MV₂ * ... * MV_N)

Where:

RCN = Replacement Cost New
Base Rate = \$ rate based on use and style
ABRV = Additive Base Rate Variables
Effective Area = Adjusted SF area of improvement

deviation from base size
AFRV = Additive Flat Rate Variables
MV = Multiplicative Variables

Depreciation Table

Base Year
2017

Effective Age of Building	% Depr.	% Good	Effective Year Built
0	0	100	2017
1	1	99	2016
2	2	98	2015
3	2	98	2014
4	3	97	2013
5	3	97	2012
6	4	96	2011
7	4	96	2010
8	4	96	2009
9	4	96	2008
10	5	95	2007
11	5	95	2006
12	5	95	2005
13	5	95	2004
14	6	94	2003
15	6	94	2002
16	6	94	2001
17	6	94	2000
18	6	94	1999
19	7	93	1998
20	7	93	1997
21	7	93	1996
22	7	93	1995
23	7	93	1994
24	8	92	1993
25	8	92	1992
26	8	92	1991
27	8	92	1990
28	8	92	1989
29	9	91	1988
30	9	91	1987
31	9	91	1986
32	9	91	1985
33	9	91	1984
34	9	91	1983
35	10	90	1982
36	10	90	1981
37	10	90	1980
38	10	90	1979
39	10	90	1978
40	10	90	1977
41	11	89	1976
42	11	89	1975
43	11	89	1974
44	11	89	1973
45	11	89	1972

46	11	89	1971
47	12	88	1970
48	12	88	1969
49	12	88	1968
50	12	88	1967
51	12	88	1966
52	12	88	1965
53	12	88	1964
54	13	87	1963
55	13	87	1962
56	13	87	1961
57	13	87	1960
58	13	87	1959
59	13	87	1958
60	14	86	1957
61	14	86	1956
62	14	86	1955
63	14	86	1954
64	14	86	1953
65	14	86	1952
70	15	85	1947
75	16	84	1942

2018 Vision Commercial CAMA Cost Approach Valuation Process

The market-derived cost approach to the valuation of real estate follows the generic formula of **Market Value = ((RCN LD) + land value)**, where **RCN** is Replacement Cost New of the improvements and **LD** means Less Depreciation. When properly developed and calibrated, this approach is a reliable indicator of market value especially suited to mass-appraisal CAMA systems.

The following exercise will attempt to illustrate how the Vision[®] CAMA system utilized by the District of Columbia, calculates values using the above model. The first portion will illustrate the development of the Replacement Cost New of a small commercial building, and the last portion will show the steps involved in determining the amount of depreciation that has accrued to the building. Land valuation is not discussed in this exercise.

Replacement Cost New

The Vision[®] CAMA system arrives at a RCN value for commercial properties based on a market-calibrated hybrid cost model. The hybrid nature of the model simply means that the model employs both additive and multiplicative variables in its design and specification. The nature of the model will become clearer as we proceed through this exercise. Please also be aware that a model is dynamic in both its specifications and calibration. The specifications, those cost elements that comprise the model, may change from time to time based upon research and market conditions. The calibration of the model is primarily derived from information provided by the Marshall and Swift Valuation Service, a company that provides building cost data necessary for real estate cost valuations and is widely considered the authority on the cost approach to valuation. *As you may discover, the dollar rates, or calibrations, contained here most likely are different from the current model in use.* The model used in this exercise is as follows:

$$\begin{aligned} \text{Building RCN} = & [\text{Section}_1 (\text{Base Rate} * \text{Effective Area} * \text{Size Adjustment}) * \\ & (\text{MV}_1 * \text{MV}_2 * \dots * \text{MV}_n)] + \\ & [\text{Section}_n (\text{Base Rate} * \text{Effective Area} * \text{Size Adjustment}) * \\ & (\text{MV}_1 * \text{MV}_2 * \dots * \text{MV}_n)] + \\ & [\sum \text{Special Building Features}] \end{aligned}$$

Where:

RCN = Replacement Cost New

Base Rate = \$ rate based on occupancy (use) code and construction class

Section_n = Each separate building or section of building

Effective Area = Adjusted SF area of improvement

Size Adjustment = Adjustment factor for deviation from base size

MV = Multiplicative Variables

Several items will be helpful while examining the features of the cost model and they are collected as Appendix “A” of this document. You will need to refer to them often during this exercise. They include the following:

- Sample building’s Property Record Card (PRC)
- Cost.dat printout of the sample building
- Depreciation Schedule
- 2016 CAMA Construction Valuation Guideline – Commercial

The commercial building designed for this exercise is typical of a small commercial property in the District. It consists of a one-story full service restaurant and an adjoining two-story building. The two-story section consists of a package goods store and a small apartment on the second floor. The building is of good quality and is constructed of brick veneer over concrete block. For this exercise, the building has been logically sectioned into two sections. Section 1 covers the restaurant and Section 2 covers the package goods/apartment portion.

Below shows the Construction Detail in the CAMA record of the building. The first illustration depicts Section 1 – the restaurant and the second represents Section 2 – the package goods store and apartment.

Base Rate Values	
Value Source C	Living Area/GBA 5,400
Prim Bldg Use 45	Effective Area 8,460
Style	size Adjustment 1.2386

Style	C: Brick/Concr
Model:	94: Commercial
Grade	40: Good
Stories	2
# Units	1.00
Shape/Peri	2: Rectangular
CDU	VG: Very Good
1st Floor Occ	045
Prim Bldg Use	045
Exterior Finish	C: Concrete
Wall Height	12.00
Structure Class	C: Brick/Concr

Illustration 1

Base Rate Values	
Value Source C	Living Area/GBA 5,400
Prim Bldg Use 45	Effective Area 8,460
Style	size Adjustment 1.2386

Style	C: Brick/Concr
Model:	94: Commercial
Grade	40: Good
Stories	2
# Units	1.00
Shape/Peri	2: Rectangular
CDU	VG: Very Good
1st Floor Occ	047
Prim Bldg Use	047
Exterior Finish	C: Concrete
Wall Height	14.00
Structure Class	C: Brick/Concr

Illustration 2

Illustration 3 shows the CAMA sketch of the sample building we'll be using throughout this exercise.

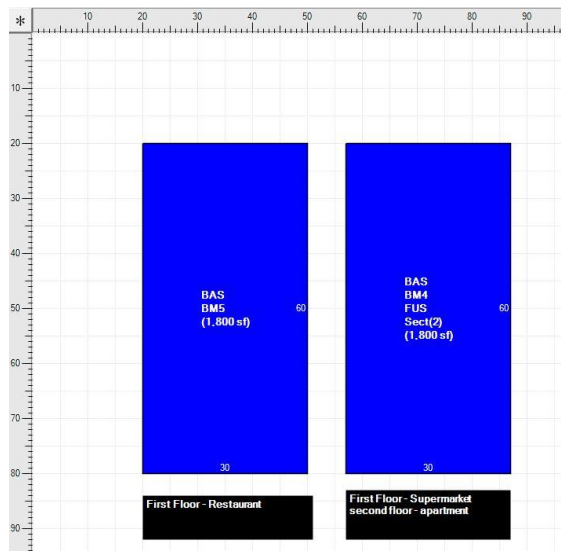


Illustration 3

Illustration 4

1. First, let's illustrate the calculation of the Effective Area of our sample building's first section, the restaurant.

$$\text{Building RCN} = [\text{Section}_1 (\text{Base Rate} * \text{Effective Area} * \text{Size Adjustment}) * (\text{MV}_0 * \text{MV}_2 * \dots * \text{MV}_n)] + [\text{Section}_n (\text{Base Rate} * \text{Effective Area} * \text{Size Adjustment}) * (\text{MV}_0 * \text{MV}_2 * \dots * \text{MV}_n)] + [\sum \text{Special Building Features}]$$

Illustration 5

The Effective Area is comprised of the totals of the Bas(1) Main Building Area @ 1,800 SF and the BM5(1) Basement, Full Finish @ 1,800 SF for a total of 3,600 SF.

The second section's Effective Area is calculated in the same manner.

Living Area/GBA 3,600
Effective Area 4,860
size Adjustment 1.419

RCN \$0
Bldg % Good 0
RCNLD \$0

Regression 0
Income \$0

Bldg+XF RCN for All Bldgs \$337,986,645

Building #: 2 of 2 Section: 1 of 1

Section Summary

Group AP1 Effective Area 4860

Base Rate 113.08 RCN \$0

Eff Base Rate \$383.37 Bldg % Good 29

Net Other Adj \$41,402.90 RCNLD \$0

Living Area/GBA 3600

Code	Description	Gross	Living	Eff Area
BAS		1800	1800	1800
BM4		1800	0	1260
FUS		1800	1800	1800

Override Initials

Illustration 6

BAS(2) Main Building Area, BM4 (2)Basement Semi-finished, and FUS (2) Upper Story, Finished total 4,860 SF. The adjustment to the semi-finished basement takes into account this area is not as expensive as the finished main building area. For example, if the base rate for the finished main building area is \$100/SF, the rate for the semi-finished basement area may only be \$70/SF. The RCN value of the basement would be calculated as follows:

$$\text{RCN of Basement} = \$126,000 \text{ or } (1800 \text{ SF} * \$70)$$

Another way to state the same situation is to adjust the size of the basement to 70% of its measured size and then multiply the resulting, *or effective*, size by the base rate of \$100/SF:

$$\text{RCN of Basement} = \$126,000 \text{ or } [(1800 * .70) * \$100]$$

Both methods arrive at the same value for the basement. The first method is more intuitive and easier to explain to taxpayers as it adjusts for the differences in costs for the various areas. The second method again provides the same results but is much easier to model and calculate within a CAMA system, thus the effective area calculations shown here represent the methodology employed in the Vision[®] CAMA system.

The Gross Area shown in Illustration 2 is the total unadjusted size of all the areas that are a part of the building. The Living Area is more properly called “Gross Floor Area” and is the unadjusted size of the actual finished floor area above grade in the building.

With the inclusion of the Effective Area calculation, our cost model now looks like this:

$$\begin{aligned} \text{Building RCN} = & [\text{Section}_1 (\text{Base Rate} * \text{3600} * \text{Size Adjustment}) * \\ & \text{Effective Area} \\ & (\text{MV}_0 * \text{MV}_2 * \dots * \text{MV}_n)] + \\ & [\text{Section}_n (\text{Base Rate} * \text{4860} * \text{Size Adjustment}) * \\ & \text{Effective Area} \\ & (\text{MV}_0 * \text{MV}_2 * \dots * \text{MV}_n)] + \\ & [\sum \text{Special Building Features}] \end{aligned}$$

2. Next, let's look at the selection of the Base Rate for the sample building. There will be two rates because there are two different sections. Each section's RCN will be independently calculated.

$$\text{Building RCN} = [\text{Section}_1 (\text{Base Rate} * \text{Effective Area} * \text{Size Adjustment}) * (\text{MV}_0 * \text{MV}_2 * \dots * \text{MV}_n)] + [\text{Section}_n (\text{Base Rate} * \text{Effective Area} * \text{Size Adjustment}) * (\text{MV}_0 * \text{MV}_2 * \dots * \text{MV}_n)] + [\sum \text{Special Building Features}]$$

The Base Rate is the dollar rate per square foot used in the valuation model that is derived from tables within the CAMA system. It is selected based on the building's Building Occupancy (Use) Code and Construction Class. Our sample's first section is a "45-Store-Restaurant" constructed as a Class "C", concrete block/brick building. Based on this information, the Base Rate of \$ 180.25 is automatically selected. The second section, "47-Store-Super Market", also constructed as a Class "C", concrete block/brick building, has a Base Rate of \$103.14.

With the inclusion of the selected Base Rates, our model now looks like this:

$$\text{Building RCN} = [\text{Section}_1 (\text{\$180.25} * \text{3600} * \text{Size Adjustment}) * (\text{MV}_0 * \text{MV}_2 * \dots * \text{MV}_n)] + [\text{Section}_n (\text{\$103.14} * \text{4860} * \text{Size Adjustment}) * (\text{MV}_0 * \text{MV}_2 * \dots * \text{MV}_n)] + [\sum \text{Special Building Features}]$$

3. Next, let us turn our attention to a modification to the Base Rate - the Size Adjustment.

$$\text{Building RCN} = [\text{Section}_1 (\text{Base Rate} * \text{Effective Area} * \text{Size Adjustment}) * (\text{MV}_0 * \text{MV}_2 * \dots * \text{MV}_n)] + [\text{Section}_n (\text{Base Rate} * \text{Effective Area} * \text{Size Adjustment}) * (\text{MV}_0 * \text{MV}_2 * \dots * \text{MV}_n)] + [\sum \text{Special Building Features}]$$

The Size Adjustment modifies the Base Rate to account for the size difference between the "standard size" for the "typical" building of a particular occupancy type and the actual size of the sample building. The comparison is based on the building's "gross floor area." The "standard" size of 5,000 square feet for the "typical" restaurant is used as the basis for establishing the initial Base Rates used in Section 1 of this appraisal.

The “standard” size of 4,000 square feet for the “typical” retail-misc. is used as the basis for establishing the initial Base Rates used in Section 2.

The adjustment in the Base Rate allows the proper square foot rate to be applied to a building based on its size. It is reasonable to expect that as a building becomes larger than typical, the rate per square foot would decrease and conversely, if the building were smaller than typical, the rate would be higher. The Size Adjustment variable is the component in the model that adjusts for this situation. Our sample building’s size, the “gross floor area,” is the total area of both sections, 5,400 square feet. Our building is only slightly larger than the standard size of 5,000 square feet. The Size Adjustment is 1.16763. Now our Adjusted Base Rate is calculated to be \$223.26 ($180.25 * 1.23860$) for Section 1 and \$ 127.75 ($103.14 * 1.23860$) for Section 2 of our example.

Because the adjustment is larger than 1.00, it would be proper to conclude that our sample building is smaller than the typical building of its type in the District of Columbia. Our sample building was compared to the larger of the two “standard” sizes, 5,000 square feet. Had the sample building been smaller than 5,000 square feet, the Size Adjustment would have been greater than 1.00. The use of size adjustments eliminates the need for the traditional cost tables based on size.

The cost model continues to grow, and now looks like this:

$$\begin{aligned} \text{Building RCN} = & [\text{Section}_1 (\text{\textcolor{red}{\$180.25}} * \text{\textcolor{red}{3600}} * \text{\textcolor{red}{1.23860}}) * \\ & \text{\textcolor{red}{Base Rate}} \quad \text{\textcolor{red}{Effective Area}} \quad \text{\textcolor{red}{Size Adjustment}} \\ & (MV_0 * MV_2 * \dots * MV_n)] + \\ & [\text{Section}_n (\text{\textcolor{red}{\$103.14}} * \text{\textcolor{red}{4860}} * \text{\textcolor{red}{1.23860}}) * \\ & \text{\textcolor{red}{Base Rate}} \quad \text{\textcolor{red}{Effective Area}} \quad \text{\textcolor{red}{Size Adjustment}} \\ & (MV_0 * MV_2 * \dots * MV_n)] + \\ & [\sum \text{Special Building Features}] \end{aligned}$$

4. The next portion of the cost model used to calculate the RCN are the multiplicative variables (MV).

$$\begin{aligned} \text{Building RCN} = & [\text{Section}_1 (\text{Base Rate} * \text{Effective Area} * \text{Size Adjustment}) * \\ & (MV_0 * MV_2 * \dots * MV_n)] + \\ & [\text{Section}_n (\text{Base Rate} * \text{Effective Area} * \text{Size Adjustment}) * \\ & (MV_0 * MV_2 * \dots * MV_n)] + \\ & [\sum \text{Special Building Features}] \end{aligned}$$

This portion of the formula can have the largest influence on the cost model. Each multiplicative variable modifies *all* of the cost data that has preceded it. These variables modify the Base Rate and Size Adjustment. This is where such important characteristics as the CDU (condition, desirability, utility), building grade, local cost multipliers, Neighborhood and Sub Neighborhood location factors have their impact.

The CDU, or Condition Desirability Utility, is the first of our multiplicative variables. This variable is used to account for a property's general overall physical condition and to a lesser extent the desirability and the utility of the property. Our sample building has been listed as "Good" and the appropriate multiplicative variable is 1.15. Stated a different way, the "Good" CDU will increase the RCN of our building by 15%. This one variable, CDU, can have a profound impact on the RCN of a building. The range can increase the RCN for an "Excellent" building by 35% all the way down to a 90% reduction in RNC for an "Unsound" building.

The sample building is graded "Good Quality - 4", and consequently has a 1.12 multiplicative variable. This one variable, grade, is going to increase the RCN value of the sample building by 12%. Another MV, "DC Local Multiplier C" modifies costs to account for the small additional costs incurred in construction of "C" class buildings in the in the DC area. The other multiplicative variable, "COMM NBHD 9", is the local neighborhood multiplier established for the particular neighborhood where the sample building is located. This variable is going to increase the RCN value of the sample building by 10%. The "COMM NBHD" adjustment reflects the market-derived fact that location is a very significant factor in the value of real estate. Two otherwise identical buildings can have a substantial difference in value based on their locations.

These four variables are summarized in the Cost.dat file as follows:

*******Factor Adjustments*******
 CONDITION DESIRABILITY UTILITY G = 1.150 X RCN
 GRADE 40 (Good) = 1.120 x RCN
 COMM NBHD 9 = 1.1 x RCN

Each MV is multiplied together to determine the combined, or overall, MV. The sample building's MV is 1.4168 (1.15 * 1.12 * 1.1).

5. Except for the Special Building Features, our RCN model is complete and contains the specific data for the sample building used in this demonstration. The RCN cost model for the sample building is as follow:

$$\begin{aligned}
 \text{Building RCN} = & [\text{Section}_1 (\text{\textcolor{red}{\$180.25}} * \text{\textcolor{red}{3600}} * \text{\textcolor{red}{1.23860}}) * \\
 & \text{\textcolor{red}{Base Rate}} \quad \text{\textcolor{red}{Effective Area}} \quad \text{\textcolor{red}{Size Adjustment}} \\
 & (\text{\textcolor{red}{1.4168}})] + \\
 & \text{\textcolor{red}{Multiplicative Variables}} \\
 & [\text{Section}_n (\text{\textcolor{red}{\$103.14}} * \text{\textcolor{red}{4860}} * \text{\textcolor{red}{1.23860}}) * \\
 & \text{\textcolor{red}{Base Rate}} \quad \text{\textcolor{red}{Effective Area}} \quad \text{\textcolor{red}{Size Adjustment}} \\
 & (\text{\textcolor{red}{1.4168}})] + \\
 & \text{\textcolor{red}{Multiplicative Variables}} \\
 & [\sum \text{Special Building Features}]
 \end{aligned}$$

The RCN for Section 1, the restaurant is \$ 1,138,733 ($\$180.25 * 3600 + 0$) * 1.23860 * 1.41680). The package goods store's RCN is \$879,642 ($\$103.14 * 4860 * 1.23860 * 1.41680$).

The Cost.dat file shows a summary of the same information as follows:

Section #1

Base Rate: 180.25

Size Adjustment: 1.23860

Effective Area: 5400

Adjusted Base Rate = $(180.25 + 0) * 1.23860$

Adjusted Base Rate: 223.26

RCN = $((223.26 * (3600 + 0) + 0) * 1.4168$

RCN: 1138733

Section #2

Base Rate: 103.14

Size Adjustment: 1.23860

Effective Area: 5400

Adjusted Base Rate = $(103.14 + 0) * 1.23860$

Adjusted Base Rate: 127.75

RCN = $((127.75 * 4860) + 0) * 1.41680$

RCN: 879642

So far, the RCN of the building is \$ 2,018,375 (1,138,733+879,642). We still have Special Features to add to complete the cost model.

6. The Special Features component is the last portion of the cost model. This is the place where such things as sprinklers and HVAC systems are accounted for and valued in the building.

$$\begin{aligned} \text{Building RCN} = & [\text{Section}_1 (\text{Base Rate} * \text{Effective Area} * \text{Size Adjustment}) * \\ & (\text{MV}_0 * \text{MV}_2 * \dots * \text{MV}_n)] + \\ & [\text{Section}_n (\text{Base Rate} * \text{Effective Area} * \text{Size Adjustment}) * \\ & (\text{MV}_0 * \text{MV}_2 * \dots * \text{MV}_n)] + \\ & [\text{Special Building Features}] \end{aligned}$$

Take a look at illustration 7. Here we see that both sections are sprinklered and heated and cooled with a complete HVAC system. Both of these Special Building features are calculated based on the size, in square feet, of the area affected. Their value is determined by the size, dollar rate and quality grade for each feature. Finally, the Special Building Features are depreciated at the same rate as the main buildings.

Building #: 1 of 1

Special Building Features												
Section	Code	Description	Sub Typ	Sub Type desc	Unit Type	Units	Unit Price	Year	Deprec Rate	Pct Good	Quality	RCN
1	HVAC	(HVAC) Heating	617	Cmplt HVAC	SF	1800	\$9.19	1978	0	72	3	\$16,542.00
1	SPRK	Sprinklers	683	Wet	SF	1800	\$4.90	1978	0	72	3	\$8,820.00
1	HVAC	(HVAC) Heating	617	Cmplt HVAC	SF	3600	\$9.19	1978	0	72	3	\$33,084.00
2	SPRK	Sprinklers	683	Wet	SF	1800	\$4.90	1978	0	100	3	\$8,820.00

Illustration 7

Illustration 8 shows the data-entry screen, as it would look if we were to add an elevator to the building.

Special Building Features

Section	Code	Description	Sub Type	Sub Type desc	Unit Type	Units	Unit Price	Year	Deprec Rate	Pct Good	Quality	RCN
1	HVAC	(HVAC) Heating	617	Cmplt HVAC	SF	1800	\$9.19	1978	0	72	3	\$16,542.00
1	SPRK	Sprinklers	683	Wet	SF	1800	\$4.90	1978	0	72	3	\$8,820.00
1	ELEV	Private Elevator	652	Power Freight	Count	1	\$32,250.00	1978	0	72	3	\$32,250.00
1	HVAC	(HVAC) Heating	617	Cmplt HVAC	SF	3600	\$9.19	1978	0	72	3	\$33,084.00
2	SPRK	Sprinklers	683	Wet	SF	1800		1978	0	100	3	

OBXF Calc Error Parcel: 183145 - Extra Feature Code HVAC : 617 Cannot retrieve constr row fo

Add Extra Features Delete Extra Features

Primary Extra Feature Information

Section: 1
Code: ELEV: Elevators
Sub Type: 652: Power Freight
Unit Price: 32250
☒ Unit Price Override
Unit Type: Count
Units: 1
Measure 1: 1

Additional Extra Feature Information

Quantity:
Quality: 3; Average
Condition:
Year: 1978
Effective Year: 1977
☐ Effective Year Override
Deprec Rate: 0
Percent Good: 72

Illustration 8

Note that this extra feature's UOM (unit of measurement) is by count and not SF. For each count, the unit price is \$35,250. Be sure that the UOM is proper for the individual special feature included in the building.

The total RCN of the Special Feature in this sample is \$ 67,266 (Σ Special Building Features =16,542 + 8,820 +33,084 + 8,820).

We now know the total replacement cost new (RCN) of our sample building, including Special Features, is \$ 2,085,641 (\$2,018,375 + \$67,266).

$$\begin{aligned}
 \text{Building RCN} &= [\text{Section}_1 (\text{Base Rate} * \text{Effective Area} * \text{Size Adjustment}) * \\
 &\quad (\text{Multiplicative Variables})] + \\
 &\quad [\text{Section}_n (\text{Base Rate} * \text{Effective Area} * \text{Size Adjustment}) * \\
 &\quad (\text{Multiplicative Variables})] + \\
 &\quad [\$67,266] \\
 &\quad [\Sigma \text{ Special Building Features}]
 \end{aligned}$$

If the sample building were brand new, we'd be finished, but it was actually built in 1953.

Next, we need to address accrued depreciation . . .

Depreciation

Depreciation is defined as a loss in the upper limits of value from all sources. Typically, three types of depreciation can affect real estate - physical deterioration, functional obsolescence and economic obsolescence. This next portion of the demonstration will illustrate how Vision[®] calculates the amount of depreciation accrued to our sample building.

Several terms come into use when discussing depreciation in CAMA. They are defined as follows:

- Actual Age: The mathematical difference between the Base Year and the actual year the improvement was built to completion.
- Actual Year Built (AYB): The earliest time the main portion of the building was built. It is not affected by subsequent construction.
- Base Year: The year, usually the current year, that the depreciation table is calibrated, such that the age of a building built during the base year would be 0 years old.
- Depreciation Table: A market-driven table that lists the amount of depreciation corresponding to an Effective Year Built and the Base Year predicated upon a specific economic life.
- Economic Life: The useful life span for a structure based on its occupancy (use) code and its construction class.
- Effective Age: The mathematical difference, in years, between the Base Year and the Effective Year Built.
- Effective Year Built (EYB): The calculated or apparent year, that an improvement was built that is most often more recent than AYB. The EYB is determined by the condition and quality of the improvement. Subsequent renovation, additions, upgrades and the like, extend an improvements remaining economic life and therefore cause the EYB to be closer to the Base Year than the AYB.
- Percent Good: The mathematical difference between 100 percent and the percent of depreciation. $(100\% - \text{depreciation } \%) = \text{percent good}$

The RCN model used above indicated that our sample building has an RNC of \$2,778,884. As stated earlier, the building was built in 1953, so there should be some depreciation to deduct from the RCN. We'll use a seven-step process to depreciate the improvements:

1. Calculate the Actual Age of the improvement.
2. Determine the Effective Age of the improvement.
3. Determine the improvement's Effective Year Built.
4. Look-up Depreciation corresponding to EYB on depreciation table.
5. If required, modify the depreciation by the amount given for obsolescence.
6. Apply final depreciation to RCN to determine RCN-LD.

1. Our first step is to calculate the Actual Age of our sample building. As you are aware, a valuation is always qualified as of a specific date. For ad valorem purposes in the District of Columbia, the valuation date is January 1 immediately preceding the tax year. In our example, the tax year is 2016, therefore the valuation date is January 1, 2015. This date is also significant in terms of the depreciation accrued to improvements. In the past, the nature of triennial assessments required that base years within a Tri-Group remain unchanged for a period of three years. Now, however, with the return to annual assessments, the base year coincides with the valuation date. The base year is used to determine the Actual Age of the sample building. In this case, the Actual Age of the sample building is 62 years (2015-1953).

2. The next step is to determine the sample building's Effective Age. Effective Age may or may not represent actual or chronological age. The premise is simple but the application can be confusing. If a building is built and never maintained (painting, re-roof, etc.) or remodeled, the building would quickly depreciate from physical deterioration. The CAMA system would depreciate the building at the fastest rate possible based on the selected Depreciation Table. For example, our building has an economic life of sixty years. If the building were left to rot, the Effective Age would most likely be the same as the Actual Age.

Let's say the owners of our sample building have completely neglected their property from the time it was built in 1953 to the present. Their building would have an effective age of 62 years as indicated on the Depreciation Table below:

Base Year 2015		70 Year Economic Life		60 Year Economic Life		50 Year Economic Life	
Age of Building	Effective Year Built	Percent of Depreciation	Percent Good	Percent of Depreciation	Percent Good	Percent of Depreciation	Percent Good
0	2015	0	100	0	100	0	100
1	2014	0	100	0	100	0	100
35	1980	16	84	23	77	36	64
36	1979	17	83	25	75	38	62
37	1978	18	82	26	74	42	58
38	1977	19	81	28	72	44	56
39	1976	20	80	31	69	48	52
40	1975	21	79	32	68	50	50
41	1974	23	77	34	66	52	48
42	1973	25	75	36	64	56	44
43	1972	26	74	38	62	57	43
44	1971	28	72	40	60	61	39
45	1970	29	71	44	56	63	37
46	1969	31	69	46	54	64	36
47	1968	32	68	48	52	66	34
48	1967	34	66	50	50	67	33
49	1966	36	64	52	48	70	30
50	1965	38	62	54	46	71	29
51	1964	40	60	57	43		
52	1963	42	58	59	41		
53	1962	44	56	61	39		
54	1961	46	54	63	37		
55	1960	48	52	64	36		
56	1959	50	50	65	35		
57	1958	52	48	67	33		
58	1957	54	46	69	31		
59	1956	56	44	70	30		
60	1955	57	43	71	29		
61	1954	60	40	72	28		
62	1953	61	39	73	27		
63	1952	63	37				
64	1951	64	36				
65	1950	65	35				
70	1949	71	29				

Illustration 9

The Actual Year Built (1953) and the Effective Year Built (1977) the Effective Age would be 38 years. Moving across the table, we see that a building with an EYB of 1977 has 28 percent depreciation and therefore is 72 Percent Good (100%-28%). If the RCN of our sample building is \$2,085,641 the depreciated value, RCN-LD, is only \$ 2,000,796 ($2,778,884 * 0.72$).

The situation described above rarely, if ever, occurs in the market. People do maintain and renovate their buildings and in doing so, extend the building's useful or remaining economic life. As building owners repair roofs, paint siding, replace windows and furnaces, they *prolong* the life of the building and consequently *decrease* its Effective Age.

A recent building remodel, renovation or rehabilitation will go a long way to extend its useful life. As the useful life is extended, the Effective Age is reduced and therefore the Effective Year Built is more recent than the building's Actual Year Built.

Our sample building had a major renovation done in 1998. The portion of the CAMA record that captures this information is shown in Illustration 10 below.

Base Rate Values

Value Source C	Living Area/GBA 5,400	RCN \$2,018,375	Regression 0
Prim Bldg Use 47	Effective Area 8,460	Bldg % Good 74.00	Income \$2,445,230
Style	size Adjustment 1.2386	RCNLD \$1,493,600	
Bldg+XF RCN for All Bldgs \$7,413,759			

Building #: 1 of 1 Section: 1 of 2

Section Level Depreciation

Year Built: 1953

Effective Year Built: 1977 ☒ Ovr EVB

Functional Obsol:

Economic Obsol:

Condition: NO: Normal

Percent Complete: 0

Depreciation Code:

Remodel Rating: 3: Major Renov

Year Remodeled: 1998

Override Initials:

Override Value:

Section Summary

Group	RS1	Effective Area	8460
Base Rate	103.14	RCN	\$2,018,375
Eff Base Rate	\$316.31	Bldg % Good	74
Net Other Adj	\$0.00	RCNLD	\$1,493,600
Living Area/GBA	5400		

Code	Description	Gross	Living	Eff Area
BAS		1800	1800	1800
BM5		1800	0	1800

	Value	Type	Reason Code	Date	ID	Comment
% Good	74	T: Temporary	F: Functional	2/13/2015	15	239: ROBERT
Misc. Improve	Remove			Select a date	15	
Cost to Cure	Remove			Select a date	15	

Override Appraised: Override Assessed: cns_override_initial

Illustration 10

Two factors come together to determine the impact a remodel has on the amount of depreciation calculated for the building – the Remodel Rating and the Year Remodeled. How extensive the remodel is and how recently it has occurred combines to determine its overall affect on its effective year built, and in turn, the building’s depreciation. A brand-new gut rehab would substantially decrease the effective age of a building much more so than an older remodel. Conversely, an older remodel may have little or no affect on the depreciation.

We’ll see the significance of that renovation in a moment, but first, back to our sample building’s Effective Age calculation.

The construction class of the building also affects the calculation of Effective Age. It is only natural that an “A” class structure would have a longer economic life than a “D” class building (recall the story of the three little pigs). The Structure Class Age Factor makes allowance for this situation by reducing the effective age of an “A” class building by more than, say, a “D” building. As an example, CAMA reduces the effective age by 20% for “A” buildings, 15% for “B” structures, 10% on “C” buildings, and no adjustment for the “D” class buildings.

The features or variables dealing with the effective age calculation are multiplicative variables. As such, they are multiplied one by the other and then the Actual Age is multiplied by the product of the MVs. Below is the portion of the Cost.dat file that summaries these MV for our sample building.

*****Effective Age Adjustments*****

$$\begin{aligned}\text{REHAB FACTOR 3} &= .45 * \text{Age} \\ \text{STRUCTURE CLASS AGE FACTOR C} &= .9 * \text{Age} \\ \text{REHAB YEAR} &= 1.5 * \text{Age}\end{aligned}$$

The product of each of these MV adjustments is calculated to be 0.46575 ($0.45 * 0.90 * 1.5$). This product is then multiplied by the Actual Age to calculate the Effective Age. Recall our sample building's Actual Age is 62 years. The Effective Age is calculated to be 38 years ($62 * 0.6075$). Instead of CAMA using 62 chronological years to calculate depreciation, it will use 38 years, based on the building's quality and renovation. The portion of the Cost.dat file that illustrates this information is below:

```
*****
Actual Year Built: 1953
Effective Age = 62 * .6075
Effective Age: 38
Percent Good = 72
RCNLD:819890
```

Back to our renovation, the 1998 major renovation done to the building reduced the effective age to 60.75% (Rehab Factor 3 = $.45 * \text{Rehab Year} = 1.5$) of the 62 years of actual age, resulting in an effective age of 38 years old. What impact on the effective age would there be if just a small remodel occurred in 1990? We would expect the effective age not to shorten, or decrease, as much. Let's see what happens.

As you know, CAMA has many calibrated variables associated with all of the calculations it makes to determine the RCN and calculate depreciation. Again, the two variables that come into play here are the Rehab Factor and the Rehab Year. We've just seen the values of those variables were with regard to the recent major renovation example. For the 1990 remodel the values are: Rehab Factor 4 = 0.55 and Rehab Year = 1.5. This combination will reduce the effective age to 82.5% ($0.55 * 1.5$) of the 62 years of actual age, as a result, making the effective age now 31 years old.

The difference between the two scenarios is seven years. Without doing all math, the difference in the appraised value as a result of an effective age of 38 years versus 31 years is about \$200,000 on a building with a RCN of \$2,085,641. The proper documentation of remodel activity is significant when arriving at proper appraised values.

3. We're almost finished. Knowing the Effective Age makes the calculation of the Effective Year Built for our sample building very simple. The Effective Year Built is 1977 ($2015 - 38$).

4. Having established the Effective Year Built, we look up 1977 on the *60 Year Economic Life Depreciation Table* and find that the Depreciation is 28% for that year. See Illustration 11.

Base Year 2015		70 Year Economic Life		60 Year Economic Life		50 Year Economic Life	
Age of Building	Effective Year Built	Percent of Depreciation	Percent Good	Percent of Depreciation	Percent Good	Percent of Depreciation	Percent Good
0	2015	0	100	0	100	0	100
1	2014	0	100	0	100	0	100
20	1995	5	95	6	94	9	91
21	1994	5	95	7	93	10	90
22	1993	6	94	8	92	12	88
23	1992	6	94	9	91	13	87
24	1991	7	93	9	91	15	85
25	1990	7	93	10	90	16	84
26	1989	8	92	11	89	17	83
27	1988	9	91	13	87	19	81
28	1987	9	91	14	86	20	80
29	1986	10	90	15	85	23	77
30	1985	11	89	16	84	25	75
31	1984	12	88	17	83	26	74
32	1983	13	87	18	82	29	71

Illustration 11

You may notice that there is a conflict between the Cost.dat file and the depreciation table with regards to “Percent Good.” The Cost.dat file report that our building’s percent good is 74, whereas the depreciation table says it’s 83. The explanation is addressed in step 5, dealing with obsolescence and direct adjustments to depreciation, not effective year built calculations.

5. If the assessor notes any obsolesce, this is where it is addressed. Recall from the outset that we defined depreciation as a loss in value resulting from physical deterioration, functional and/or economic obsolescence. The demonstration up to this point has dealt only with depreciation attributed to the physical deterioration of the sample building. This, by far, is the most common type of depreciation that exists in commercial property. However, occasions may require additional depreciation because of excessive physical deterioration, functional and/or economic obsolescence. One must use caution when invoking these types of depreciation. The market must support any decision regarding the extent of these adjustments.

Our sample building is suffering from a small amount of functional obsolescence. The assessor has noted that the interior design of the building contains many support columns interrupting the efficient use of the floor space. As a result, the restaurant has a few less tables and the package goods store does not have a good aisle layout. Consequently, it is appropriate to allow for a small amount of functional obsolescence – five percent.

Illustration 12 shows the results of this additional allowance for functional obsolescence. Whereas the depreciation table in illustration 3 shows the percent good for 31 years at 83%, by subtracting the 11% attributed to functional obsolescence, we are left with 72% (rounding error) as the percent good for our building. This matches the figure shown in the Cost.dat file.

Building #: 1 of 1 Section: 1 of 2

Section Level Depreciation

Year Built: 1953

Effective Year Built: 1977 ☒ Ovr EYB

Functional Obsol:

Economic Obsol:

Condition: NO: Normal

Percent Complete: 0

Depreciation Code:

Remodel Rating: 3: Major Renov

Year Remodeled: 1998

Override Value:

Override Initials:

Section Summary

Group: RS1 Effective Area: 8460

Base Rate: 103.14 RCN: \$2,018,375

Eff Base Rate: \$316.31 Bldg % Good: 74

Net Other Adj: \$0.00 RCNLD: \$1,493,600

Living Area/GBA: 5400

Code	Description	Gross	Living	Eff Area
BAS		1800	1800	1800
BM5		1800	0	1800

Value Type Reason Code Date ID Comment

% Good Remove 74 T: Temporary Physical Depr 2/13/2015 15 239: ROBERT

Misc. Improve Remove Select a date 15

Cost to Cure Remove Select a date 15

Override Appraised Override Assessed cns_override_initial

Illustration 12

The actual mechanics of adjusting depreciation for functional or economic obsolescence within CAMA are briefly discussed below. If the situation occurs, seek guidance from your supervisor and/or CAMA manager.

The “Status” field’s pick-list is expanded in Illustration 13 to show only those types of items that have a direct affect on depreciation and the nature of the affect. Notice that only a limited number of Status Codes are functional within CAMA and their affect on depreciation is either to **replace** the existing amount in the “% Good” field or **decrease** the “% Good.” The corresponding numeric amount that will affect the “% Good” is entered in the field called “Percent Complete.” Please note that the field name “Percent Complete” is somewhat erroneous because the word “Complete” has no meaning in this context. This is the field that you will enter the amount to either decrease the existing “% Good” or replace the existing “% Good”, based on the Status Code selected.

Status

Code	Description	Affect on % Good
0	Default	NONE
A	Abandoned/Boarded	NONE
B	Burned Out	NONE
C	Commercial New Const	REPLACE
E	Economic Dep	DECREASE
F	Functional Dep	DECREASE
G	Gut Rehab	NONE
H	Data Change	NONE
L	Limited Equity	NONE
M	Demolition	NONE
N	N/A	NONE
NO	Normal	NONE
OV	Overall Depreciation	REPLACE
P	Physical Depr	DECREASE
PA	Partial Abandon	NONE
R	Renovation	NONE
T	Order of Taking	NONE
V	Vacant	NONE

Illustration 13

6. The last step in the process is to simply multiple the RCN by 0.72 and we have RCN LD of the building. Knowing the total RCN of our sample building is \$\$ 2,085,641 , the RCN LD is \$1,501,662 (\$ 2,085,641 * 0.72).

Conclusion

This exercise has been prepared to assist the commercial assessor understand some of the concepts, features and techniques employed by the Vision® CAMA system in arriving at a cost approach to valuation of commercial properties in the District of Columbia. It does not serve as an exhaustive training manual. Any specific questions regarding the features and operations of this CAMA should be directed to your supervisor or the CAMA manager.

Appendix “A”

1. Property Record Card, SSL 9999 8888
2. Cost.dat print-out, SSL 9999 8888
3. 2018 CAMA Construction Valuation Guideline

CURRENT OWNER				ACCOUNT INFORMATION				CURRENT ASSESSMENT				COMM				
Use Type		Use Code	Lot SF	Status Code		Description	Code	Assessed Val								
C		045	999,999	A		COM LAND	045	2,364,000								
						COMMERCL	045	1,513,780								
VISIT / CHANGE HISTORY																
Date	ID	Type	Inf. Source	Code	Description											
Washington		DC	20002						District of Columbia Real Property Assessment Division							
OWNERSHIP HISTORY				INSTRUMENT #	SALE DATE	q/u	v/i	SALE PRICE	AC	PREVIOUS ASSESSMENTS (HISTORY)						
TEST OWNER				123456	10-28-2013	Q	I	120,000,000	01	Year	Use	Type	Val Source	Land Value	Building Value	Assessed Value
										2016	045	C	C	2,364,000	1,513,780	3,877,780
										2015	052	C	C	2,999,970	111,224,440	114,224,410
										2014	021	A	C	13,995,970	1,433,000	15,428,970
										2013	021	A	I	13,995,970	1,679,030	15,675,000
										2012	021	A	C	13,995,970	1,328,140	15,324,110
										2011	045	C	C	13,995,970	1,250,920	15,246,890
										2010	045	C	C	13,995,970	1,274,640	15,270,640
				ASSOCIATED PARCELS												
				Primary SSL	SSL	USE		Lot Size		%		Total Value				
				9999	8888			999,999				3,877,780				
				COMMENTS												

CURRENT OWNER				ACCOUNT INFORMATION				CURRENT ASSESSMENT				COMM	
Use Type		Use Code	Lot SF	Status Code		Description		Code	Assessed Val				
C		045	999,999	A				COM LAND	045	2,364,000			
								COMMERC	045	1,513,780			
Date		ID	Type	Inf. Source	Code	Description							
Washington	DC	20002											
OWNERSHIP HISTORY			INSTRUMENT #	SALE DATE	q/u	v/i	SALE PRICE	AC					
TEST OWNER			123456	10-28-2013	Q	I	120,000,000	01					
MIXED USE			APPEALS										
Code	Description	%	Appeal #	Decision	Amount	Revised AV							
045	Store-Restaurant	100											
		0											
		0											
TAX TYPE			SUPPLEMENTAL DATA										
Year	Type	Description	Type	Description									
2006	TX	TAXABLE	Part Part	0									
2005	TX	TAXABLE	Mixed Use	0									
2004	TX	TAXABLE	Vcnt Lnd Use	045									
2003	TX	TAXABLE	Model Type	0									
2002	TX	TAXABLE	Restr Resale										
2001	TX	TAXABLE	Abbutt Lot	0									
2000	TX	TAXABLE	Zone Overlay										
			PUD										
PARCEL LOCATION SUMMARY													
SSL	NBHD	SUB-NBHD	ZONING	WARD	GROUP	ARN							
9999	8888	9	0	CR	6	408							
BUILDING PERMIT RECORD													
Permit ID	Issue Date	Type	Amount	Description	Insp Date								

OUTPUT FROM NEW COST MODELING ENGINE
REPORT GENERATED ON 27-Feb-2015 AT 09:39

*****Building #1 Calc Start*****

Cost Calculation for pid, bid = 183145, 173784

Account Number = 9999 8888

Use Code = 045

Cost Rate Group = RS1

Model ID: = DCC

Section #2

Section Use: Store-Super Market

Base Rate: 103.14

Size Adjustment: 1.23860

Effective Area: 5400

Adjusted Base Rate = $(103.14 + 0) \times 1.23860$

Adjusted Base Rate: 127.75

RCN = $((127.75 \times 4860 + 0.000000000000000000) \times 1.4168000000000000) + 0$

RCN: 879642

*****Factor Adjustments*****

GRADE 40 = $1.120 \times \text{RCN}$

COMM NBHD 9 = $1.100 \times \text{RCN}$

CONDITION DESIRABILITY UTILITY G = $1.150 \times \text{RCN}$

*****Effective Age Adjustments*****

STRUCTURE CLASS AGE FACTOR C = $0.900 \times \text{Age}$

CDU AGE FACTOR G = $1.000 \times \text{Age}$

REHAB FACTOR 3 = $0.450000 \times \text{Age}$

REHAB YEAR 1997 = $1.500 \times \text{Age}$

Actual Year Built: 1953

Effective Age = 38

*****Depreciation Adjustments*****

CDU DEPREC FACTOR G = $1.000 \times \text{Depreciation}$

Percent Good = 72

RCNLD: 633340

Section #1

Section Use: Store-Restaurant

Base Rate: 180.25

Size Adjustment: 1.23860
Effective Area: 5400
Adjusted Base Rate = $(180.25 + 0) \times 1.23860$
Adjusted Base Rate: 223.26
 $RCN = ((223.26 \times 3600 + 0.00000000000000000000) \times 1.4168000000000000) + 0$
RCN: 1138733

*****Factor Adjustments*****

GRADE 40 = $1.120 \times RCN$
COMM NBHD 9 = $1.100 \times RCN$
CONDITION DESIRABILITY UTILITY G = $1.150 \times RCN$

*****Effective Age Adjustments*****

STRUCTURE CLASS AGE FACTOR C = $0.900 \times \text{Age}$
CDU AGE FACTOR G = $1.000 \times \text{Age}$
REHAB FACTOR 3 = $0.450000 \times \text{Age}$
REHAB YEAR 1998 = $1.500 \times \text{Age}$

Actual Year Built: 1953
Effective Age = 38

*****Depreciation Adjustments*****

CDU DEPREC FACTOR G = $1.000 \times \text{Depreciation}$

Percent Good = 72
RCNLD: 819890

2018 Economic Life Depreciation Tables

Base Year 2017	
Age of Building	Effective Year Built
0	2017
1	2016
2	2015
3	2014
4	2013
5	2012
6	2011
7	2010
8	2009
9	2008
10	2007
11	2006
12	2005
13	2004
14	2003
15	2002
16	2001
17	2000
18	1999
19	1998
20	1997
21	1996
22	1995
23	1994
24	1993
25	1992
26	1991
27	1990
28	1989
29	1988
30	1987
31	1986
32	1985
33	1984
34	1983
35	1982
36	1981
37	1980
38	1979
39	1978
40	1977
41	1976
42	1975
43	1974
44	1973
45	1972
46	1971
47	1970
48	1969
49	1968
50	1967
51	1966
52	1965
53	1964
54	1963
55	1962
56	1961
57	1960
58	1959
59	1958
60	1957
61	1956
62	1955
63	1954
64	1953
65	1952
70	1950

70 Year Economic Life	
Percent of Depreciation	Percent Good
0	100
0	100
0	100
0	100
1	99
1	99
1	99
1	99
2	98
2	98
2	98
2	98
3	97
3	97
3	97
4	96
4	96
4	96
5	95
5	95
6	94
6	94
7	93
7	93
8	92
9	91
9	91
10	90
11	89
12	88
13	87
14	86
15	85
16	84
17	83
18	82
19	81
20	80
21	79
23	77
25	75
26	74
28	72
29	71
31	69
32	68
34	66
36	64
38	62
40	60
42	58
44	56
46	54
48	52
50	50
52	48
54	46
56	44
57	43
59	41
61	39
63	37
64	36
65	35
71	29

60 Year Economic Life	
Percent of Depreciation	Percent Good
0	100
0	100
0	100
1	99
1	99
1	99
1	99
2	98
2	98
2	98
2	98
3	97
3	97
3	97
4	96
4	96
5	95
5	95
6	94
6	94
7	93
8	92
9	91
9	91
10	90
11	89
13	87
14	86
15	85
16	84
17	83
18	82
20	80
21	79
23	77
25	75
26	74
28	72
31	69
32	68
34	66
36	64
38	62
40	60
44	56
46	54
48	52
50	50
52	48
54	46
57	43
59	41
61	39
63	37
64	36
65	35
67	33
69	31
70	30
71	29

50 Year Economic Life	
Percent of Depreciation	Percent Good
0	100
0	100
0	100
1	99
1	99
1	99
1	99
1	99
2	98
2	98
2	98
3	97
3	97
4	96
4	96
5	95
5	95
6	94
7	93
7	93
9	91
9	91
10	90
12	88
13	87
15	85
16	84
17	83
19	81
20	80
23	77
25	75
26	74
29	71
31	69
34	66
36	64
38	62
42	58
44	56
48	52
50	50
52	48
56	44
57	43
61	39
63	37
64	36
66	34
67	33
70	30
71	29

2018 CAMA Commercial Construction Valuation Guideline -- RPAD

CONSTRUCTION DETAIL

Section Detail

No. Description Value

Building Stories

As Indicated.

Occupancy

As Indicated.
Select from list.

Stories and #Units

As Indicated.

Structure Class

0 Default
A Fireproof Steel
B Reinforced Concrete
C Con. Block/Solid Brick
D Wood Frame
P Wood Pole
S Steel/Sheet Metal

Exterior Finish

0 Typical
AS Asphalt Siding
BR Brick (Solid)
BV Brick Veneer
C Concrete
CB Concrete Block
MS Metal Siding
S Stone
SU Stucco
SV Stone Veneer
WS Wood Siding

Grade (Multiplies Base, Features)

0 Default --
0 Poor Quality -30%
15 Poor+ Quality -20%
20 Fair Quality -10%
25 Fair+ Quality -05%
30 Average Quality --
35 Average+ Quality 06%
40 Good Quality 12%
45 Good+ Quality 21%
50 Very Good Quality 30%
55 Very Good + Quality 38%
60 Excellent 45%

Story Height (Multiplies Base)

Currently not in use

Wall Height (Adds to Base Rate)

Currently not in use

CDU Condition, Desirability, Utility (Multiplies Base, Features)

EX Excellent 35%
VG Very Good 30%
G Good 15%
AV Average --
F Fair -25%
P Poor -50%
VP Very Poor -70%
US Unsound -90%

DEPRECIATION DETAIL

No. Description Value

Structure Class (Adjust EYB)

0 Default 0
A Fireproof Steel -20%
B Reinforced Conc. -15%
C Con. Block/Brick -10%
D Wood Frame 0
S Steel/Sheet Metal 0

Remodel Rating (Adjusts EYB)

0 Default --
1 Unknown -10%
2 Gut Rehab -70%
3 Major Renovation -55%
4 Remodel -45%
5 Addition -30%
6 Cosmetic -10%

Year Remodeled (Adjust EYB)

2013-2016 0%
2011-2012 5%
2006-2010 15%
2001-2005 25%
Earlier-2000 50%

Extra Features (Flat and Sq Ft Add)

BL Balcony Flat
ELEV Elevators Flat
HVAC Heat & Cool Sq. Ft.
MZ Mezzanines Sq. Ft.
SPRK Sprinklers Sq. Ft.

$$\text{Building RCN} = [\text{Section}_1 (\text{Base Rate} * \text{Effective Area} * \text{Size Adjustment}) * (\text{MV}_0 * \text{MV}_2 * \dots * \text{MV}_N)] + [\text{Section}_n (\text{Base Rate} * \text{Effective Area} * \text{Size Adjustment}) * (\text{MV}_0 * \text{MV}_2 * \dots * \text{MV}_N)] + [\text{Special Building Features}]$$

Where:

RCN = Replacement Cost New
Base Rate = \$ rate based on occupancy (use) code and construction class

Section_n = Each separate building or section of building

Effective Area = Adjusted SF area of improvement

Size Adjustment = Adjustment factor for deviation from base size

MV = Multiplicative Variables

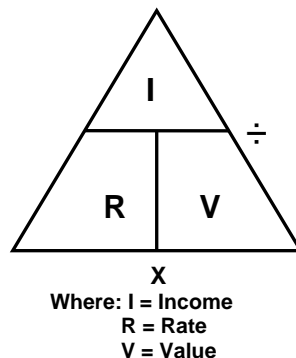
2018 Vision® CAMA Income Approach Valuation Process

The income approach to the valuation of real property follows the generic formula of **Market Value = NOI/Capitalization Rate**, where **NOI** is the net operating income of the property and the **Capitalization Rate** is a market-derived overall direct capitalization rate. When properly developed and calibrated, this approach is a reliable indicator of market value of income producing properties within a mass-appraisal CAMA system.

The following exercise will illustrate how the Vision® CAMA system utilized by the District of Columbia calculates values using the above model. The first section will illustrate the traditional development of a market value estimate for a typical apartment building. This example will serve to provide a practical foundation for understanding the concepts of the income approach to valuation as well as an understanding of the major components of the Vision® CAMA methodology. The second section will illustrate the actual CAMA valuation of the apartment building described in the first section.

Income Approach to Value

An understanding of the income capitalization approach to value is essential in order to utilize the Vision® CAMA system's income model. Of the three traditional approaches to value (cost, market, income), the income approach is most often the appropriate approach when appraising property owned for its ability to produce income to the owner. An owner anticipates future income production and the income approach quantifies the present value of the income derived from the ownership of the property. There are several varieties or forms of the income approach used to quantify or convert income into an estimate of value. The most widely used approach is direct capitalization. Direct capitalization involves converting one year's stabilized net operating income into an estimate of value in one direct step using an appropriate rate. The direct capitalization method is rooted in the market. The rate used to convert income into value represents the relationship between value and income through the following formula:



Formula 1

To determine an estimate of value, divide the income by the rate. The income is the net operating income (NOI) and the rate is the direct capitalization rate. For example, if a property generates an NOI of \$500,000 per year and the market-derived capitalization rate is 5 percent, the indicated value would be \$10,000,000 ($\$500,000/.05$).

Where do these two numbers come from? The first number, NOI, is determined by a combination of things. First, the income and expenses of the particular property are analyzed and “re-constructed” to produce the NOI. Re-constructing simply means that we analyze the income and more particularly the expenses to ensure that we have a true understanding and estimate of the amount of net operating income annually produced by the property. Oftentimes an income report will detail some expenses not directly associated with the property. For example, the debt service of a loan on the property may be subtracted from the gross income. This is not a proper expense as it is a function of the owner’s financing and not an operating expense of the property. Another example may be a large “expense” taken against gross income that should be more properly spread over several years, or capitalized. Expense ratios are calculated for the various categories of expenses.

Another source for determining the NOI of a property is the analysis of many other similar properties for their income levels and expense levels or ratios. If the subject property’s income and expenses are typical for similar properties, the actual NOI of the property becomes the amount to be capitalized by the rate. If, on the other hand, the property exhibits unusual income or expenses based on comparison of the ratios, some actual amounts of income or expenses may be substituted with the amounts represented by more typical ratios. The goal is to establish the typical level of NOI that a prudent investor would anticipate deriving from the property each year.

Where does the rate come from? The rate is the overall direct capitalization rate. This is the rate for the overall property used to convert a single year’s income into an indication of value of the overall property using the IRV formula shown above. The rate is derived through sales analysis. Ideally, where arms-length sales of similar properties occur and the income and expense data are well known, a direct capitalization rate can be derived using the IRV formula. For example, suppose the subject property is an office building and a similar office building recently sold for \$750,000. The reconstructed income and expense analysis indicated that at the time of sale the property was producing an annual net operating income of \$60,000. Using the IRV formula, the capitalization rate of the property was 8 percent ($\$60,000/\$750,000$). Reliable capitalization rates are the result of the analysis of many sales of income producing properties.

The following illustration is an example of an income and expense statement for our sample property. The property, Breakaway Northwest, is a high-rise apartment complex consisting of a one eight story concrete block building. The building has 164 rental units, a management office, laundry facility and on-site surface parking. It is located close to the Convention Center in NW Washington,

DC. We'll use this property both here and in the example within Vision® CAMA in the second part of this tutorial.

Breakaway Northwest Apartments	
- December 31, 2010-	
Potential Gross Income	\$3,820,680
Vacancy & Collection Loss (7%)	-267,448
Miscellaneous Income (laundry) (2%)	<u>+ 62,600</u>
Effective Gross Income	\$3,615,832
Expenses	
Operating:	
Management (9%)	\$321,200
R.E. Taxes (7%)	262,000
Insurance (7%)	245,800
Utilities (7%)	238,700
Salaries (6%)	220,250
Marketing (4%)	130,400
Yard and Snow (2%)	<u>89,500</u>
<i>Sub-total (42%)</i>	\$1,507,850
Reserves for Replacements:	
Roof (4%)	\$150,400
Parking (3%)	121,000
Redecorating (3%)	115,948
Appliances (3%)	<u>102,400</u>
<i>Sub-total (13%)</i>	\$489,748
Total Expenses (55%)	\$1,997,598
Net Operating Income (45%)	<u>\$1,618,234</u>
Capitalization Rate	5.25%
Indicated Market Value	<u>\$30,823,500</u>

Illustration 1

As you examine the statement, you'll notice a few terms we have not discussed. The **potential gross income** is defined as the maximum amount of income the property can produce if fully rented at market rent before any expenses are deducted. There will always be some amount to deduct from the potential gross income in the form of **vacancy** and **collection loss**. Even if the property is fully

leased, the appraiser must take some vacancy allowance to acknowledge tenant turn-over and inevitable vacancies. It is unrealistic not to allow for some vacancy. Collection loss is that amount deducted from the potential gross income for nonpayment of rent.

In addition to rent, a property may have other sources of income. This **miscellaneous income** can come from such sources as an on-site laundry facility, furniture rental, community room rentals, vending machines, and the like.

When an amount for vacancy and collection loss is subtracted, and an amount for miscellaneous income is added to the gross potential income, the result is the **effective gross income** of the property. Expenses are subtracted from, and expense ratios are calculated based upon, the effective gross income.

Expenses usually fall into two categories: **operating expenses** and **reserves for replacements**. Sometimes operating expenses may be further divided between variable and fixed expenses. Operating expenses are those legitimate expenses necessary to support the property's ability to produce income. The sample shows some of the more typical expenses incurred by an apartment building. Notice the calculation of the expense ratios mentioned earlier. As an example, the expense ratio for management is nine percent of the effective gross income (\$321,200/\$3,615,832). These actual ratios are compared to typical ratios to see if any expenses are out of the ordinary. If they are out-of-line and no adequate explanation can be identified, it is appropriate to substitute that category of expense with an amount that would be more normal as indicated by market research. This is an aspect of "re-constructing" the income/expense statement to more properly reflect a stable, normalized net operating income.

Reserves for replacements are a category of expenses that are designed to set aside funds for long lived items that periodically need to be replaced. The amount of the expense is based on the item's economic life and the estimated cost to replace it in the future. Let's say that appliances must be replaced every five years at an estimated cost of \$3,122 per unit. With 164 units, we need to accumulate \$ 512,000 over a five year period. Charging \$102,400 per year to the reserves for replacements expense allows us to set aside enough money to replace the appliances according to the five year schedule. It is always appropriate to set aside reserves for replacements, even though in practice a property may not have done so. This is another aspect to "re-constructing" the traditional income/expense statement.

Subtracting the total expenses from the effective gross income leaves us with the net operating income of the property. The NOI of the property is the "I" in the IRV formula that will be converted to an indication of value using a capitalization rate.

As mentioned earlier, we employ the direct capitalization of income to produce an estimate of value. The capitalization rates are determined by the analysis of sales of similar properties where the NOI is known. Capitalization rates vary between and within different categories of income-producing properties. Analysis

of the market is necessary to determine the proper rate to apply to the different properties. For example, a capitalization rate for a high quality office building in a prime location will be lower than a capitalization rate for a lower quality office in a less desirable location. With all other things remaining equal and no unusual externalities, capitalization rates for offices are generally less than rates for motels or shopping centers. It all harkens back to the level of return the buyers expect to receive on their investment in commercial real estate. One of their considerations is that the more risk involved with the property, the more return they require thereby raising the capitalization rate resulting in a lower valuation.

In our example, a market-derived capitalization rate for apartments of similar size and location indicate a direct capitalization rate of 5.25 percent. We now know the NOI and the cap rate and by following the IRV formula, we derive the value of Breakaway Northwest to be \$30,823,500 ($\$1,618,234 / 0.0525$).

The above discussion accurately represents the typical application of the income approach to valuation. However, determining valuations for ad-valorem purposes requires one significant modification to the process. Whereas in the above example we considered real estate taxes a legitimate expense, they are not expensed in ad-valorem appraisals. They are removed in our approach to account for the fact that the tax expense is directly determined by the very value we are trying to obtain. To avoid this circular situation whereby taxes affect value (lower NOI, if expensed) and value affects taxes, we remove the item from the NOI. Our tax-adjusted NOI will now be \$1,880,232 ($\$1,618,234 + \$262,000$). This is another aspect to reconstructing the income/expense statement illustrated earlier.

As a consequence of removing real estate taxes from the expenses and thereby increasing the NOI by a corresponding amount, we compensate by modifying the capitalization rate. The modification to the market cap rate allows us to remove real estate taxes from the net operating expenses and replace the loss by increasing the cap rate by the effective tax rate.

The cap rate we utilize for ad-valorem appraisals is a 'loaded' cap rate, meaning that it is comprised of both the market cap rate and the District's effective tax rate for apartments. Apartments are taxed at the residential tax rate. For this exercise the tax rate is \$0.85 per \$100 of assessed value, therefore the effective tax rate is 0.0085 ($0.85 / 100$). If the market cap rate is 5.25 percent and the effective tax rate is 0.85 percent, then our 'loaded' cap rate is 6.10 percent ($0.0525 + 0.0085$).

Based on the information we now have, we can estimate the market value of the subject apartment to be \$30,823,500 ($\$1,880,232 / 0.061$), the same as determined just a moment ago.

The above discussion has been presented as a review of the income approach to valuation, more specifically the direct capitalization technique. Included was an example of the valuation of an apartment building. In the next section, we'll again value the same apartment building but conduct the valuation from within

the District's CAMA system. Although the work flow may appear different, the underlying IRV formula should generate the same results.

Vision's® CAMA Income Approach to Value

In addition to the market-calibrated cost approach utilized by CAMA to value the residential property in the District, CAMA also has the capability to value commercial property using the more appropriate approach – the income capitalization approach. The discussion in this section will serve to illustrate the manner in which a commercial property, an apartment building, is valued based on the income approach.

To effectively value property, complete and accurate property characteristics must be known. Although the physical characteristics such as wall type, roof type, building style and the like are important, the most important information regarding commercial property subject to the income approach are characteristics of the property dealing with its ability to produce income. In an office building, for example, the gross building area or net leaseable area are important. In hotels and motels the significant measure is the number of rooms available. And in apartment buildings it would be the number and style of the units for rent.

We'll begin our appraisal of Breakaway Northwest by identifying the "mix" of units in the building. The table below represents this information.

The mix of units is as follows:

No. of Bedrooms	1 Bed	2 Bed	3 Bed
No. of Bathrooms	1 Bath	1 Bath	2 Bath
No. of Units	62	76	26

Table 1

From our previous discussion of the income approach, we know that there are four "key" areas having to do with the income approach to value:

- Gross Income (Rent)
- Vacancy & Expenses
- Net Operating Income
- Capitalization Rate

The illustration below highlights the location of these key areas on the data entry screen within CAMA.

Economic Income Valuation ☐ Select Economic Account ☐ Exclude from Land Residual Rep Year: 2016

Land Use: 021 Residential Apartment-V Neighborhood: 40

Year Built: 1980 Cost: \$30,080,490 Value/Bldg SF: \$203,247

Leasable Area/Units: AREA GL 148 AREA UL 0 AREA LL 0 Gross Area 148

Cap Code: HR2 : HIGH RISE 2 Cap Adj: 3 : AVERAGE Cap Rate: 0.0550

Notes: Breakaway Northwest elevator apartment, 8

Apply Value ☐ GIM Code: GIM Adj: GIM Factor: ☐ GIM

GROSS RENT \$4,044,680 Vacancy \$199,104 EXP \$1,845,876 NOI \$1,999,700 BLDG VALUE \$36,358,180 Other Adjustment 0 INCOME \$36,358,180 Per SF/Unit \$245,663.37

Key Areas on Income Screen

Bldg	Section	Style	DescriptionXX	Use	Locati	Tenants	Area	Floor	Gross Rent	Vacancy	Vac %	Vac Amt	Expense	Exp %	Exp Amount	
1	1	1101	1BR, 1BA	3	3	0	46	19440.0	19440.0	\$894,240.00	3	0.0500	44,712	3	0.4800	407773
1	1	2101	2BR, 1BA	3	3	0	76	28560.0	28560.0	2,170,560.00	3	0.0500	108,528	3	0.4800	989775
1	1	3201	3BR, 2BA	3	3	0	26	35280.0	35280.0	\$917,280.00	3	0.0500	45,864	3	0.4800	418280
1	1	5000	APT MISC INCOME	3	3	0	0	0.00	0.00	\$62,600.00	3	0.0000	3	0.4800	30048	

Illustration 2

Gross Rent

Recall we will be appraising the same apartment property from the example in the first section. Let's first turn our attention to the Gross Rent. We'll be entering information for each section, using one line for each *style* of apartments. By style, we mean the unit of comparison designated for apartment buildings – 1 bed-1 bath, 2 bed w/den-1 bath, 3 bed-2 bath, and the like.

Let's look at the first line of the table:

	Bldg	Section	Style	DescriptionXX	Use	Locati	Tenants	Area		Floor		Gross Rent	Vacancy	Vac %	Vac Am	Expense	Exp %	Exp Amount
▶	1	1	1101	1BR, 1BA	3	3	0	46	19440.0	19440.0	\$894,240.00	3	0.0500	44,712	3	0.4800	407773	
	1	1	2101	2BR, 1BA	3	3	0	76	28560.0	28560.0	2,170,560.00	3	0.0500	108,528	3	0.4800	989775	
	1	1	3201	3BR, 2BA	3	3	0	26	35280.0	35280.0	\$917,280.00	3	0.0500	45,864	3	0.4800	418280	
	1	1	5000	APT MISC INCOME	3	3	0	0	0.00	0.00	\$62,600.00	3	0.0000	3	0.4800	30048		

Illustration3

Our first line will account for the 1 bedroom-1 bath units in the complex. The style code "1101" is selected from a pick-list that describes the different styles available for apartments. Please refer to the illustration below for a partial list of Income Style for apartments.

Illustration 4

0000	JR. EFFICIENCY
0101	EFFICIENCY
0102	EFFICIENCY, SM
0103	EFFICIENCY, LG
1101	1BR, 1BA
1102	1BR, 1BA, SM
1103	1BR, 1BA, LG
1111	1BR+DEN, 1BA
1113	1BR+DEN 1BA, LG
2101	2BR, 1BA
2102	2BR, 1BA, SM
2103	2BR, 1BA, LG
2111	2BR+DEN, 1BA
2113	2BR+DEN 1BA, LG
2201	2BR, 2BA
2202	2BR, 2BA, SM

There are sixty-two 1BR, 1BA units and that number is recorded in the “SF/Unit” column of the table. In addition to recording the style and number of units, the appraiser may choose to modify the Gross Rent by taking into consideration both the tenant desirability and the location of the apartment. The two columns labeled “Use” and “Loc” account for these adjustments, respectively. The adjustments are percentage increases or decreases to the Gross Income from the default value of “average.” Both the “Use” and “Loc” allow for the same percent adjustment each, as shown in the illustration below.

Illustration 5

Economic Income Valuation

☐ Select Economic Account
☐ Exclude from Land Residual Rep

Year: 2016

Land Use: 021 Residential Apartment-V Neighborhood 40

022

009

Apply Value ☐

GROSS RENT \$4,044,680

Year Built 1980

Cap Code HR2 : HIGH RISE 2

GIM Code

Vacancy \$199,104

Cost \$30,080,490

Cap Adj 3 : AVERAGE

GIM Adj

EXP \$1,845,876

Value/Bldg SF: \$203,247

Cap Rate 0.0550

GIM Factor

NOI \$1,999,700

Leasable Area/Units

Notes Breakaway Northwest, elevator apartment, 8

GIM

BLDG VALUE \$36,358,180

AREA GL 148

Other Adjustment 0

INCOME \$36,358,180

AREA UL 0

Per SF/Unit \$245,663.37

AREA LL 0

Gross Area 148

Bldg	Section	Style	DescriptionXX	Use	Locati	Tenants	Area	Floor	Gross Rent	Vacancy	Vac %	Vac Amx	Expense	Exp %	Exp Amount
1	1	1101	1BR, 1BA	3	3	0	46	19440.0	19440.0	\$894,240.00	3	0.0500	44,712	3	0.4800 407773
1	1	2101	2BR, 1BA	3	3	0	76	28560.0	28560.0	2,170,560.00	3	0.0500	108,528	3	0.4800 989775
1	1	3201	3BR, 2BA	3	3	0	26	35280.0	35280.0	\$917,280.00	3	0.0500	45,864	3	0.4800 418280
1	1	5000	APT MISC INCOME	3	3	0	0	0.00	0.00	\$62,600.00	3	0.0000	3	0.4800 30048	

The amount of adjustment is based on the table below:

Rating	Description	Location	Use
1	POOR	0.80	0.80
2	FAIR	0.90	0.90
3	AVERAGE	1.00	1.00
4	GOOD	1.10	1.10
5	EXCELLENT	1.25	1.25
A	AVERAGE	1.00	1.00
S	NON-MARKET	1.00	0.90

Table 2

In our example, we chose not to make any adjustments for location or desirability to any of the apartment units in this property.

The Base Rate shows the annual rent for each unit of the particular style “1101” – 1BR, 1BA. In this example the rent is \$1,620 per month or \$19,440 on an annual basis as shown in the base rate column. This value has been selected from a table in CAMA. The table has been calibrated based upon market analysis of current rents segmented by location and style, throughout the District. Below is an excerpt of a table that illustrates the rents for our particular property.

		OLD CITY #2
Code	Description	Monthly Rent
0000	JR. EFFICIENCY	1255
0101	EFFICIENCY	1330
0102	EFFICIENCY, SM	1255
0103	EFFICIENCY, LG	1465
1101	1BR, 1BA	1620
1102	1BR, 1BA, SM	1475
1103	1BR, 1BA, LG	1800
1111	1BR+DEN, 1BA	1885
1113	1BR+DEN 1BA, LG	2075
2101	2BR, 1BA	2380
2102	2BR, 1BA, SM	2145
2103	2BR, 1BA, LG	2610
2111	2BR+DEN, 1BA	2740
2113	2BR+DEN 1BA, LG	3010
2201	2BR, 2BA	2740
2202	2BR, 2BA, SM	2465
2203	2BR, 2BA, LG	3010

2211	2BR+DEN, 2BA	3285
2213	2BR+DEN 2BA, LG	3620
3101	3BR, 1BA	2550
3102	3BR, 1BA, SM	2290
3103	3BR, 1BA, LG	2805
3111	3BR+DEN, 1BA	2940
3113	3R+DEN 1BA, LG	3220
3201	3BR, 2BA	2940
3202	3BR, 2BA, SM	2635

Table 3

Notice that our subject property is located in the Old City #2 market. The District of Columbia is divided into nine separate markets for income modeling purposes. The market influences within Old City #2 are, for example, different from the influences within Southwest or Georgetown markets. Separate rent rate and vacancy and expense ratio schedules exist for each separate market.

As we continue with our example, we account for the other two styles of units in a similar manner. At this point, the gross rent has been calculated to be \$4,293,120. But, if you recall from the income and expense statement, the property generated an additional \$62,600 in non-rental income. We need to include this amount to determine to total gross income.

To account for the miscellaneous income, select “5000 APT MISC INCOME” as the style and enter the actual amount directly into the Gross Rent column. We want to be sure to set the “OV?”(override), column to “Yes.” By doing so, we ensure that the amount does not get adjusted for vacancy and collection loss discussed in the next section. Typically, only rental income is subjected to vacancy and collection loss. See the illustration below:

Bldg	Section	Style	DescriptionXX	Use	Locati	Tenants	Area	Floor	Gross Rent	Vacancy	Vac %	Vac Amt	Expense	Exp %	Exp Amount
1	1	1101	1BR, 1BA	3	3	0	62	19440.0	19440.0	1,205,280.00	3	0.0500	60,264	3	549608
1	1	2101	2BR, 1BA	3	3	0	76	28560.0	28560.0	2,170,560.00	3	0.0500	108,528	3	989775
1	1	3201	3BR, 2BA	3	3	0	26	35280.0	35280.0	\$917,280.00	3	0.0500	45,864	3	418280
1	1	5000	APT MISC INCOME	3	3	0	0	0.0	0.0	\$62,600.00	3	0.0000	3	0.4800	30048

Illustration 6

This concludes our discussion of the Gross Rent tab in the CAMA system. We have accounted for all of the rent attributable to the property and concluded that the Gross Rent is the sum of \$ 4,355,720, the same amount as shown on the income and expense sheet from section one. Next, we'll turn to the Vacancy & Expenses portion of the record.

Vacancy and Expenses

Our work in the Vacancy and Expenses will be similar to what we did in the Gross Income. However, in this table we'll account for four items:

- Vacancy amount
- EGI (Effective Gross Income) calculation

- Expense amount
- NOI (Net Operating Income) calculation

The value of the NOI calculated here will be the basis for the final valuation using the IRV formula, after selecting a rate. See below:

Parcel Information

SSL: 9999/ / / 7777/ / Primary Use: 021 Use Type: A Internal ID: 201605 Work In Prog 0 Living Area: 201000
 Location: 9999 7TH ST NW Total Assess: \$39,151,870 Land Acres: 99,999 \$SF/ Liv/GBA 194.79

Economic Income Valuation ☐ Select Economic Account ☐ Exclude from Land Residual Rep Year: 2016

Land Use: 021 Residential Apartment-V Neighborhood 40
 022 009 Apply Value ☐
 Year Built 1980 Cap Code HR2 : HIGH RISE 2 GIM Code
 Cost \$30,080,490 Cap Adj 3 : AVERAGE GIM Adj
 Value/Bldg SF: \$183,418 Cap Rate 0.0550 GIM Factor GIM ☐
 Leasable Area/Units Notes Breakaway
 AREA GL 164 Northwest,
 AREA UL 0 elevator
 AREA LL 0 apartment, 8
 Gross Area 164

GROSS RENT \$4,355,720
 Vacancy \$214,656
 EXP \$1,987,711
 NOI \$2,153,353
 BLDG VALUE \$39,151,870
 Other Adjustment 0
 INCOME \$39,151,870
 Per SF/Unit \$238,730.91

Bldg	Section	Style	DescriptionXX	Use	Locati	Tenants	Area	Floor	Gross Rent	Vacancy	Vac %	Vac Am	Expense	Exp %	Exp Amount	
1	1	1101	1BR, 1BA	3	3	0	62	19440.0	19440.0	1,205,280.00	3	0.0500	60,264	3	0.4800	549608
1	1	2101	2BR, 1BA	3	3	0	76	28560.0	28560.0	2,170,560.00	3	0.0500	108,528	3	0.4800	989775
1	1	3201	3BR, 2BA	3	3	0	26	35280.0	35280.0	\$917,280.00	3	0.0500	45,864	3	0.4800	418280
1	1	5000	APT MISC INCOME	3	3	0	0	0.0	0.00	\$62,600.00	3	0.0000	3	0.4800	30048	

Illustration 7

A Vacancy and Expenses line is automatically created for each style shown on the Gross Rent. The values are based on the market area of the property and are derived from market analysis. Recall that our apartments are located in the Old City #2 market. CAMA populates the Vac% column and the Exp% column with the market rates appropriate for Old City #2; in this case it would be based on this table:

	GEORGETOWN	NORTHEAST	OLD CITY #2	SOUTHEAST
Vacancy Ratio	4%	7%	5%	8%
Expense Ratio	42%	60%	48%	60%

Table 4

We have inspected the property and concur that the vacancy rate should be five percent, to coincide with typical vacancies for properties in Old City #2.

Parcel Information

SSL: 9999/ / / 7777/ / Primary Use: 021 Use Type: A Internal ID: 201605 Work In Prog: 0 Living Area: 201000
Location: 9999 7TH ST NW Total Assess: \$39,151,870 Land Acres: 99,999 \$SF/ Liv/GBA: 194.79

Economic Income Valuation ☐ Select Economic Account ☐ Exclude from Land Residual Rep Year: 2016

Land Use: 021 Residential Apartment-V Neighborhood: 40
022 009 Apply Value ☐

Year Built: 1980 Cap Code: HR2: HIGH RISE 2 GIM Code:
Cost: \$30,080,490 Cap Adj: 3: AVERAGE GIM Adj:
Value/Bldg SF: \$183,418 Cap Rate: 0.0550 GIM Factor: ☐ GIM

Leasable Area/Units Notes: Breakaway
AREA GL: 164 Northwest
AREA UL: 0 elevator
AREA LL: 0 apartment, 8
Gross Area: 164

GROSS RENT: \$4,355,720
Vacancy: \$214,656
EXP: \$1,987,711
NOI: \$2,153,353
BLDG VALUE: \$39,151,870
Other Adjustment: 0
INCOME: \$39,151,870
Per SF/Unit: \$238,730.91

Bldg	Section	Style	DescriptionXX	Use	Locati	Tenants	Area	Floor	Gross Rent	Vacancy	Vac %	Vac Am	Expense	Exp %	Exp Amount	
1	1	1101	1BR, 1BA	3	3	0	62	19440.0	19440.0	1,205,280.00	3	0.0500	60,264	3	0.4800	549608
1	1	2101	2BR, 1BA	3	3	0	76	28560.0	28560.0	2,170,560.00	3	0.0500	108,528	3	0.4800	989775
1	1	3201	3BR, 2BA	3	3	0	26	35280.0	35280.0	\$917,280.00	3	0.0500	45,864	3	0.4800	418280
1	1	5000	APT MISC INCOME	3	3	0	0	0.00	\$62,600.00	3	0.0000	3	0.4800	30048		

Illustration 8

If, however, we found the property to have less than typical vacancy we could have selected “4 Good.” Whereas the typical vacancy for the Old City #2 market area is 5 percent, had we selected “Good”, the vacancy rate would have been modified by appropriate multiplier in the adjustment table. The adjusted amount would have been 2.5 percent (0.05×0.50). The amount of adjustment for both vacancy and expense are shown in the table below.

Rating	Description	Vacancy	Expense
1	POOR	2.00	1.25
2	FAIR	1.50	1.10
3	AVERAGE	1.00	1.00
4	GOOD	0.50	0.90
5	EXCELLENT	0.25	0.75
A	AVERAGE	1.00	1.00
S	NON-MARKET	0.25	1.00

Table 5

The Expense % may be adjusted in a similar manner, but we’ll leave it set to the typical percent associated with the Old City #2 market of forty-eight percent. By subtracting the Exp. Amount from the EGI, we get the NOI of the property. CAMA has calculated the NOI to be \$2,153,353, identical to our earlier income and expense report modified for real estate taxes discussed earlier.

Economic Income Valuation ☐ Select Economic Account ☐ Exclude from Land Residual Rep Year: 2016

Land Use: 021 Residential Apartment-V Neighborhood: 40
 022 009
 Year Built: 1980 Cap Code: HR2 : HIGH RISE 2 Apply Value: ☐
 Cost: \$30,080,490 Cap Adj: 3 : AVERAGE GIM Code:
 Value/Bldg SF: \$183,418 Cap Rate: 0.0550 GIM Adj:
 Leasable Area/Units Notes: Breakaway Northwest, elevator apartment, 8 GIM Factor: ☐ GIM

GROSS RENT \$4,355,720
 Vacancy \$214,656
 EXP \$1,987,711
 NOI \$2,153,353
 BLDG VALUE \$39,151,870
 Other Adjustment 0
 INCOME \$39,151,870
 Per SF/Unit \$238,730.91

Bldg	Section	Style	DescriptionXX	Use	Locati	Tenants	Area	Floor	Gross Rent	Vacancy	Vac %	Vac Am	Expense	Exp %	Exp Amoun
1	1	1101	1BR, 1BA	3	3	0	62	19440.0	1,205,280.00	3	0.0500	60,264	3	0.4800	549608
1	1	2101	2BR, 1BA	3	3	0	76	28560.0	2,170,560.00	3	0.0500	108,528	3	0.4800	989775
1	1	3201	3BR, 2BA	3	3	0	26	35280.0	\$917,280.00	3	0.0500	45,864	3	0.4800	418280
1	1	5000	APT MISC INCOME	3	3	0	0	0.00	\$62,600.00	3	0.0000		3	0.4800	30048

Illustration 9

We're almost finished. The last piece of the valuation process is the capitalization rate.

Capitalization Rate

Capitalization rates will vary across the District based on the class of property (office, retail, apartments, etc.) and its location (market area). Capitalization rates are assigned to apartments based on their market location and type of apartment complex. The District is divided into three submarkets. Each of these submarkets provides a separate cap rate for high-rise and low-rise apartments. Neighborhood 40/E, Old City II, is located in the Northwest market area and our subject is a high-rise type complex.

The assigned capitalization rate for high-rise apartments in the Northwest market area is 0.055 or 5.5 percent. Remember, this is the 'loaded' cap rate. See the illustration below.

Economic Income Valuation ☐ Select Economic Account ☐ Exclude from Land Residual Rep Year: 2016

Land Use: 021 Residential Apartment-V Neighborhood: 40
 022 009
 Year Built: 1980 Cap Code: HR2 : HIGH RISE 2 Apply Value: ☐
 Cost: \$30,080,490 Cap Adj: 3 : AVERAGE GIM Code:
 Value/Bldg SF: \$183,418 Cap Rate: 0.0550 GIM Adj:
 Leasable Area/Units Notes: Breakaway Northwest, elevator apartment, 8 GIM Factor: ☐ GIM

GROSS RENT \$4,355,720
 Vacancy \$214,656
 EXP \$1,987,711
 NOI \$2,153,353
 BLDG VALUE \$39,151,870
 Other Adjustment 0
 INCOME \$39,151,870
 Per SF/Unit \$238,730.91

Bldg	Section	Style	DescriptionXX	Use	Locati	Tenants	Area	Floor	Gross Rent	Vacancy	Vac %	Vac Am	Expense	Exp %	Exp Amoun
1	1	1101	1BR, 1BA	3	3	0	62	19440.0	1,205,280.00	3	0.0500	60,264	3	0.4800	549608
1	1	2101	2BR, 1BA	3	3	0	76	28560.0	2,170,560.00	3	0.0500	108,528	3	0.4800	989775
1	1	3201	3BR, 2BA	3	3	0	26	35280.0	\$917,280.00	3	0.0500	45,864	3	0.4800	418280
1	1	5000	APT MISC INCOME	3	3	0	0	0.00	\$62,600.00	3	0.0000		3	0.4800	30048

Illustration 10

Upon analysis of the property and its income and expenses, an adjustment to the cap rate is not warranted and therefore the cap rate adjustment is set to “Average”. Had the property been located closer to the Mt. Vernon Metro station, there may have been a reason to adjust the cap rate down to reflect the property’s good performance based on its proximity to the station. In that situation, instead of ‘average’, we would want to adjust the rate to “Good” thereby lowering the rate. This adjustment is accomplished by the Cap Adjustment dialog box. See below.

Bldg	Section	Style	DescriptionXX	Use	Locati	Tenants	Area	Floor	Gross Rent	Vacancy	Vac %	Vac Am	Expense	Exp %	Exp Amoun
1	1	1101	1BR, 1BA	3	3	0	62	19440.0	19440.0	1,205,280.00	3	0.0500	60,264	3	0.4800 549608
1	1	2101	2BR, 1BA	3	3	0	76	28560.0	28560.0	2,170,560.00	3	0.0500	108,528	3	0.4800 989775
1	1	3201	3BR, 2BA	3	3	0	26	35280.0	35280.0	\$917,280.00	3	0.0500	45,864	3	0.4800 418280
1	1	5000	APT MISC INCOME	3	3	0	0	0.00	\$62,600.00	3	0.0000	3	0.4800	30048	

Illustration 11

Had we agreed that the performance was “Good”, our original cap rate of 5.5 percent would have been modified to 4.95 percent (0.061×0.90). Remember IRV tells us that, all other things being equal, the lower the cap rate the higher the property value and vice versa.

Cap Rating	Description	Adjustment
0	VERY POOR	1.30
1	POOR	1.20
2	FAIR	1.10
3	AVERAGE	1.00
4	GOOD	0.90
5	EXCELLENT	0.80
A	AVERAGE	1.00

Table 6

Valuation

We have almost come to the end of our example and exercise. One simple division remains. Knowing that the NOI is \$2,153,353 and that the overall direct capitalization rate is 0.055, we can calculate the estimated value of Breakaway Northwest to be \$39,151,870 (\$2,153,353/0.055). Again, this is identical to the amount estimated in the first section of the exercise. The final results are highlighted below.

Economic Income Valuation ☐ Select Economic Account ☐ Exclude from Land Residual Rep Year: 2016

Land Use: 021 Residential Apartment-V Neighborhood: 40
 022 009
 Year Built: 1980
 Cost: \$30,080,490
 Value/Bldg SF: \$183,418
 Leasable Area/Units:
 AREA GL: 164
 AREA UL: 0
 AREA LL: 0
 Gross Area: 164

Rate
 Cap Code: HR2 : HIGH RISE 2
 Cap Adj: 3 : AVERAGE
 Cap Rate: 0.0550
 Notes: Breakaway Northwest, elevator apartment, 8

Apply Value ☐
 GIM Code:
 GIM Adj:
 GIM Factor:
 Value: ☐

Income
 GROSS RENT: \$4,355,720
 Vacancy: \$214,656
 EXP: \$1,987,711
NOI: \$2,153,353
BDLG VALUE: \$39,151,870
 Other Adjustment: 0
 INCOME: \$39,151,870
 Per SF/Unit: \$238,730.91

Bldg	Section	Style	DescriptionXX	Use	Locati	Tenants	Area	Floor	Gross Rent	Vacancy	Vac %	Vac Am	Expense	Exp %	Exp Amoun
1	1	1101	1BR, 1BA	3	3	0	62	19440.0	19440.0	1,205,280.00	3	0.0500	60,264	3	549608
1	1	2101	2BR, 1BA	3	3	0	76	28560.0	28560.0	2,170,560.00	3	0.0500	108,528	3	989775
1	1	3201	3BR, 2BA	3	3	0	26	35280.0	35280.0	\$917,280.00	3	0.0500	45,864	3	418280
1	1	5000	APT MISC INCOME	3	3	0	0	0.00	0.00	\$62,600.00	3	0.0000	3	0.4800	30048

Illustration 12

Some Final Thoughts

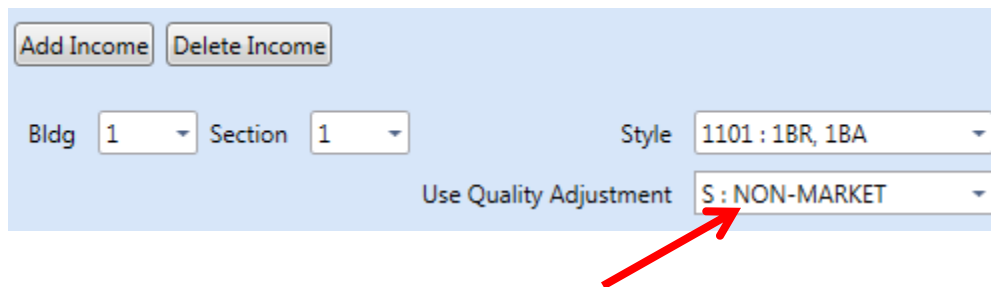
We have introduced you to some of the most elementary aspects of property valuation using the District's Vision® CAMA system. We have developed the estimated market value of a fictitious apartment complex, utilizing the direct capitalization income approach to value. This guideline is merely a small window, a first step, in the complex field of mass appraisal. A CAMA system robust enough to appraise almost 200,000 different properties will necessarily be comprehensive and complex. Additionally, an initial valuation generated by CAMA is always subject to the review and approval of a qualified, professional appraiser before it becomes a final value. As you explore and utilize the program make certain that you fully understand the ramifications and results of your actions. Your supervisor and/or CAMA manager will always be available to assist you.

Guidelines for Non-Market Multifamily (Apartment) Assessment

Various affordable multi-family residential properties benefit from some public funding programs. The funding programs mostly impose restrictions that run with the land for a determined period in exchange for some restricted rent or other subsidy.

There are many categories of low-income multifamily housing with many or different complex capital financial structures, which makes its valuation a challenge. Examples of low-income (affordable) housing development includes, Section 202 housing, Section 221, Section 8 certificate and voucher program, Hope VI program, Low Income Housing Tax Credit (LIHTC) etc.

In simplifying the valuation/assessment process of low-income housing, and for OTR purposes, apartment units in low-income multifamily development under any kind of government program are referred to as “**non-market**” unit; denoted by “**S: NON-MARKET**” in Vision CAMA program under all adjustments categories except the capitalization rate.



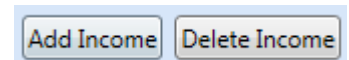
The screenshot shows a software interface with a light blue background. At the top, there are two buttons: 'Add Income' and 'Delete Income'. Below these, there are three dropdown menus: 'Bldg' with the value '1', 'Section' with the value '1', and 'Style' with the value '1101 : 1BR, 1BA'. To the right of these is a label 'Use Quality Adjustment' followed by a dropdown menu showing 'S : NON-MARKET'. A red arrow points to the 'S : NON-MARKET' dropdown menu.

Valuation Methodology

Income approach is generally accepted as the most reliable valuation method of appraising low-income multifamily housing developments. The sales comparison approach is less applicable due to limited or total lack of truly comparable sales, because of different income characteristics and government restrictions imposed on these properties. Also, these developments are sometimes too old, to make conclusion of market value via cost approach reliable.

The objective of this guide line is to focus on estimating market value of “non-market” apartments using Vision CAMA income model for consistency and consideration to existing restrictions by the government program in the housing development.

When the unit-mix consists of market and non-market units – Use to populate the unit-mix in the income model table.



The screenshot shows a software interface with a light blue background. It contains two buttons: 'Add Income' and 'Delete Income'.

Sample Apartment Units-Mix.

S = Non-Market Units

Bldg	Section	Style	DescriptionXX	Use	Locati	Tenants	Area
1	1	1101	1BR, 1BA	3	3	0	45
1	1	2101	2BR, 1BA	3	3	0	20
1	1	3201	3BR, 2BA	3	3	0	15
1	1	5000	APT MISC INCOME	3	3	0	0
1	1	1101	1BR, 1BA	S	3	0	15
1	1	2101	2BR, 1BA	S	S	0	5

Market = 80 units
Non-Market = 20 units
Total = 100

Style: 2101 : 2BR, 1BA

Use Quality Adjustment: S : NON-MARKET

The income model automatically adjusts market rent when “S: NON-MARKET” is selected under Use Quality Adjustment.

Rent								Market Rent	Adjusted	
Bldg	Section	Style	DescriptionXX	Use	Locati	Tenants	Area		Floor	Gross Rent
1	1	1101	1BR, 1BA	S	3	0	15	19440. UL	17496.	\$262,440.00

When the I&E report have the actual (received) rent for any non-market unit, check the box in front of Gross Rent and override it with the actual rent.

Style: 2101 : 2BR, 1BA

Use Quality Adjustment: S : NON-MARKET

Sub Areas: 0

Gross Rent: 125000 ☒

Actual Rent (override)

Actual Rent (override)										
Bldg	Section	Style	DescriptionXX	Use	Locati	Tenants	Area		Floor	Gross Rent
1	1	2101	2BR, 1BA	S	S	0	5	28560. UL	25000	\$125,000.00

Select or apply non-market vacancy adjustment to all non-market units

Debt/Vac Adjustment **S : NON-MARKET** Debt/Vac Amount **1563** ☐ Ovr

Bldg	Section	Style	DescriptionXX	Use	Locati	Tenants	Area	Floor	Gross Rent	Vacancy	Vac %	Vac Am
1	1	1101	1BR, 1BA	3	3	0	45	19440.0	\$874,800.00	3	0.0500	43,740
1	1	2101	2BR, 1BA	3	3	0	20	28560.0	\$571,200.00	3	0.0500	28,560
1	1	3201	3BR, 2BA	3	3	0	15	35280.0	\$529,200.00	3	0.0500	26,460
1	1	5000	APT MISC INCOME	3	3	0	0	0.00	\$62,600.00	3	0.0000	
1	1	1101	1BR, 1BA	S	3	0	15	19440. UL	\$262,440.00	S	0.0125	3,281
1	1	2101	2BR, 1BA	S	S	0	5	28560. UL	\$125,000.00	S	0.0125	1,563

Expenses and cap rate should be consistent for all the units except otherwise determined by the appraiser based on verifiable data.

Expense Adjustment **3 : AVERAGE** Expense Amount **59250** ☐ Ovr

Bldg	Section	Style	DescriptionXX	Use	Locati	Tenants	Area	Floor	Gross Rent	Vacancy	Vac %	Vac Am	Expense	Exp %	Exp Amount
1	1	1101	1BR, 1BA	3	3	0	45	19440.0	\$874,800.00	3	0.0500	43,740	3	0.4800	898909
1	1	2101	2BR, 1BA	3	3	0	20	28560.0	\$571,200.00	3	0.0500	28,560	3	0.4800	250467
1	1	3201	3BR, 2BA	3	3	0	15	35280.0	\$529,200.00	3	0.0500	26,460	3	0.4800	241315
1	1	5000	APT MISC INCOME	3	3	0	0	0.00	\$62,600.00	3	0.0000		3	0.4800	30048
1	1	1101	1BR, 1BA	S	3	0	15	19440. UL	\$262,440.00	S	0.0125	3,281	3	0.4800	124397
1	1	2101	2BR, 1BA	S	S	0	5	28560. UL	\$125,000.00	S	0.0125	1,563	3	0.4800	59250

Cap Code **HR2 : HIGH RISE 2**
 Cap Adj **3 : AVERAGE**
 Cap Rate **0.0550** ☐ Ovr

Finally, check your analysis for accuracy and value conclusion.

GROSS RENT \$2,425,240
 Vacancy \$103,603
 EXP \$1,114,386
 NOI \$1,207,252
 BLDG VALUE \$21,950,040
 Other Adjustment **0**
 INCOME \$21,950,040
 Per SF/Unit \$219,500.40

APPENDIX:

Sample PRC

SSL 9999 7777		Internal ID 201605	Sales Information				Commercial Data Elements	
Location	9999 7TH ST NW		Sale Date	Q/U	V/I	Sale Price	Exterior Finish	BR Brick
Current Owner		01-01-2006	Q	I	41,472,000			
BREAKAWAY NORTHWEST APTS INC		01-01-2005	Q	I	39,000,000			
9999 7TH ST		01-01-2004	Q	I	35,000,000			
		01-01-2003	U	I	0			
		01-01-2002	Q	I	30,000,000			
WASHINGTON		DC 20001-999	Year Built			1980		
Additional Owners:			Total Appraised Parcel Value			36,358,180		
						9.0	1.6421	

2016

INCOME VALUATION

Washington, DC

2/27/2015 10:40:37 AM

ECONOMIC INCOME VALUATION																				
Leaseable Area Summary					Cap Rate			Income			Income Value			Notes						
Ground Level		148			Cap Code	HR2		Gross Income		4,044,680		Income Value		36,358,180		Breakaway Northwest, elevator apartment, 8 story building. NW corner of 6th and M St., NW. Recently remodeled. Close to Mt. Vernon Sq. Metro.				
Lower level		0			Cap Adjust	3		Vacancy Allowance		199,104		Other Adjust		0						
Upper Level		0			Cap Rate	0.0550		Expense Allowance		1,845,876		Total Income Value		36,358,180						
					Rent ID	NBHD		Net Income		1,999,700		Value per SF/Unit		245.663						
					009	40														

[illegible]

PLEASE ALLOW THIS EXAMPLE TO BE USED AS A GUIDE TO UNDERSTANDING YOUR APPRAISAL.

CBD, INC. Office Building

December 31, 2015

Potential Gross Income

Office: 198,000 sq. ft. X \$52	\$10,296,000
Retail: 7,500 sq. ft. X \$65	487,500
Parking	500,000
Antenna Lease	<u>30,000</u>

1. Total Potential Gross Income **\$ 11,313,500**

2. less Vacancy & Collection Loss (7%) **- 754,845**

3. Effective Gross Income **\$ 10,558,655**

Expenses

Operating:

4. Office Area (24%, rounded) **\$ 2,345,944**

5. Retail Area (25%, rounded) **113,344**

6. Parking & Antenna (25%, rounded) **132,500**

7. Reserves for Replacements (2% of PGI) **226,270**

8. Total Expenses **- \$ 2,818,058**

9. Net Operating Income **\$7,740,597**

10. Class 'A' Property Capitalization Rate **6.00 %**

11. Indicated Market Value **\$129,009,950**

SSL 9999 8888		Internal ID 183145		Sales Information				Commercial Data Elements				<div>2017</div> <div>INCOME VALUATION</div> <div>Washington, DC</div> <div>12/31/2015 10:00:17 AM</div>										
Location 9999 9TH ST NW				Sale Date	Q/U	V/I	Sale Price															
Current Owner				10-28-2013	Q	I	125,000,000															
CDB, INC								Exterior Finish	0	Typical												
9999 9TH ST								Wall Height	12	7.6098												
Washington DC 20002				Year Built 2005																		
Additional Owners:				Total Appraised Parcel Value 129,009,950																		
ECONOMIC INCOME VALUATION																						
Leaseable Area Summary				Cap Rate				Income				Income Value				Notes						
Ground Level 7,500				Cap Code OA1				Gross Income 11,313,500				Income Value 11 129,009,950										
Lower level 0				Cap Adjust A				Vacancy Allowance 754,845				Other Adjust 0										
Upper Level 198,000				Cap Rate 10 0.0600				Expense Allowance 2,818,057														
				Rent ID NBHD								Total Income Value 129,009,950										
Total Leaseable Area 205,500				001 10				Net Income 7,740,597				Value per SF/Unit 628										
#	Bldg #	Sect #	Style	Adj Table	OCC	SF/Unit	Fir Lev	Base Rate	Use Adj	Loc Adj	Rent SF/Unit	Gross Rent	Vac	Vac %	Vacancy Allowance	EGI	EXP	EXP %	EXP /SF	Expenses	NOI	
1	1	1	OF OFFICE CL	3	0	198000	UL	52.00	3	3	52.00	10,296,000	3	0.07	720,720	9,575,280	3	0.24		2,345,944	7,229,336	
2	1	1	O OFF RETAI	3	7500	7500	GL	65.00	3	3	65.00	487,500	3	0.07	34,125	453,375	3	0.25		113,344	340,031	
3	1	1	O OFF PARKI	6	0	0	LL	0.00	3	3	500000.0	500,000	3	0.00	0	500,000	3	0.25		125,000	375,000	
4	1	1	O OFF MISC I	6	0	0	UL	0.00	3	3	30000.00	30,000	3	0.00	0	30,000	3	0.25		7,500	22,500	
5	1	1	O OFF RESE	6	0	0	GL	0.00	3	3		0	3	0.00	0	0	3	0.00		226,270	-226,270	
												1		2	3						8	9
						205,500						11,313,500			754,845		10,558,655			2,818,058	7,740,597	

2018 CAMA Residential Construction Valuation Guideline -- RPAD

USECODE

(Selects Base Rate)

No.	Description	Value
011	Row	\$137.12
012	Detached	\$158.38
013	Semi-Detached	\$138.41
015	Mixed Use	\$137.12
019	Miscellaneous	\$137.12
023	Small Apt. Bldg.	\$112.25
024	Conversion	\$143.42

CONSTRUCTION DETAIL

No.	Description	Value
-----	-------------	-------

Style (Descriptive)

1	1 Story
2	1.5 Story Unfin
3	1.5 Story Fin
4	2 Story
5	2.5 Story Unfin
6	2.5 Story Fin
7	3 Story
8	3.5 Story Unfin
9	3.5 Story Fin
10	4 Story
11	4.5 Story Unfin
12	4.5 Story Fin
13	Bi-Level
14	Split Level
15	Split Foyer

Foundation (Descriptive)

0	No Data
4	Pier
5	Wood
6	Concrete

View (Descriptive)

0	Typical
1	Poor
2	Fair
3	Average
4	Good
5	Very Good
6	Excellent

Building Type (Descriptive)

0	Default	
1	Single	
2	Multi	
6	Row End	\$2.50
7	Row Inside	
8	Semi-Detached	

Roof (Add to Base Rate)

0	Typical	
1	Comp Shingle	
2	Built Up	
3	Shingle	\$0.68
4	Shake	\$0.79
5	Metal-Pre	\$0.50
6	Metal Sms	\$0.50
7	Metal-Cpr	\$0.50
8	Composition Roll	-\$0.43
9	Concrete Tile	\$1.88
10	Clay Tile	\$2.93
11	Slate	\$2.86
12	Concrete	\$1.88
13	Neoprene	\$0.00
15	Wood- FS	\$0.68

Exterior Finish (Add to Base Rate)

0	Default	
1	Plywood	
2	Hardboard Lap	
3	Metal Siding	
4	Vinyl Siding	
5	Stucco	
6	Wood Siding	
7	Shingle	
8	SPlaster	
9	Rustic Log	
10	Brick Veneer	\$3.95
11	Stone Veneer	\$9.38
12	Concrete Block	
13	Stucco Block	
14	Common Brick	\$3.95
15	Face Brick	\$3.95
16	Adobe	
17	Stone	\$9.38
18	Concrete	\$3.95
19	Aluminum	
20	Brick/Stone	\$6.67
21	Brick/Stucco	\$1.98
22	Brick/Siding	\$1.98
23	Stone/Stucco	\$4.69
24	Stone/Siding	\$4.69

Heat Type (Add to Base Rate)

0	No Data	
1	Forced Air	
2	Air-Oil	\$0.55
3	Wall Furnace	-\$1.27
4	Electric Rad	-\$0.29
5	Elec Base Brd	-\$0.20
6	Water Base Brd	\$1.42
7	Warm Cool	
8	Ht Pump	
9	Evp Cool	
10	Air Exchng	
11	Gravity Furnace	
12	Ind Unit	
13	Hot Water Rad	

AC Type (Add to Base Rate)

0	Default	
N	No	
Y	Yes	\$1.80

Floor Covering (Add to Base Rate)

0	Default	\$2.50
1	Resilient	\$2.63
2	Carpet	\$2.17
3	Wood Floor	\$6.06
4	Ceramic Tile	\$8.53
5	Terrazzo	\$8.30
6	Hardwood	\$7.17
7	Parquet	\$8.15
8	Vinyl Comp	\$1.64
9	Vinyl Sheet	\$2.86
10	Lt Concrete	\$0.75
11	Hardwood/Carp	\$4.67

Per Unit Adjustment (Flat Rate Add)

Full Bath (over 1)	\$12,500
Half Bath	\$ 7,500
Fireplace	\$ 8,500
Kitchen	\$11,500
Finished Basement (Basic)	\$22.00/sf
Finished Basement (Partition)	\$59.00/sf
Basement Garage	\$55.00/sf
Carport	\$33.00/sf
Stoop	\$22.00/sf
Open Porch	\$22.00/sf
Covered Open Porch	\$38.50/sf

Screen Enclosed Porch	\$41.25/sf
Glass Enclosed Porch	\$46.75/sf
Fully Enclosed Porch	\$55.00/sf
Deck	\$24.75/sf
Patio	\$ 8.25/sf

Grade (Multiplies Base, Add & Flat)

0	Default	
1	Low Quality	0.50
2	Fair Quality	0.75
3	Average Quality	1.00
4	Above Average Quality	1.08
5	Good Quality	1.18
6	Very Good Quality	1.30
7	Excellent Quality	1.45
8	Superior Quality	1.68
9	Extraordinary – A	1.95
10	Extraordinary – B	2.15
11	Extraordinary – C	2.55
12	Extraordinary – D	2.90

Interior Condition (Multiplies Base, Add & Flat)

0	Typical	
1	Poor	.794
2	Fair	.843
3	Average	1.000
4	Good	1.089
5	Very Good	1.182
6	Excellent	1.239

Exterior Condition (Multiplies Base, Add & Flat)

0	Default	
1	Poor	.794
2	Fair	.843
3	Average	1.000
4	Good	1.089
5	Very Good	1.182
6	Excellent	1.239

Overall Condition (Multiplies Base, Add & Flat)

0	Default	
1	Poor	.794
2	Fair	.843
3	Average	1.000
4	Good	1.089
5	Very Good	1.182
6	Excellent	1.239

Remodel Type (Multiplies Base, Add & Flat)

0	Default	
1	Unknown	
2	Gut Rehab	1.43
3	Major Renov	1.26
4	Remodel	1.08
5	Addition	
6	Cosmetic	1.02

The effect of this multiplier diminishes at a rate of 5% per year based on the **Remodel Year**.

2018 CAMA Residential Construction Valuation Guideline -- RPAD

DEPRECIATION DETAIL

No.	Description	Value
-----	-------------	-------

Grade (Adjust EYB)		
0	Default	
1	Low Quality	20%
2	Fair Quality	10%
3	Average Quality	--
4	Above Average	-05%
5	Good Quality	-10%
6	Very Good Quality	-15%
7	Excellent Quality	-25%
8	Superior Quality	-35%
9	Extraordinary – A	-45%
10	Extraordinary – B	-50%
11	Extraordinary – C	-50%
12	Extraordinary – D	-50%

Bath Style (Adjust EYB)

0	Default	
1	No Remodeling	
2	Semi-Modern	- 05%
3	Modern	- 10%
4	Luxury	- 20%

Kitchen Style (Adjust EYB)

0	Default	
1	No Remodeling	
2	Semi-Modern	- 10%
3	Modern	- 20%
4	Luxury	- 40%

Building RCN = [(Base Rate + \sum ABRV_n) * Effective Area * Size Adjustment + \sum AFRV_n] * (MV₀ * MV₂ * ... * MV_N)

Where:

RCN = Replacement Cost New
 Base Rate = \$ rate based on use and style
 ABRV = Additive Base Rate Variables
 Effective Area = Adjusted SF area of improvement
 Size Adjustment = Adjustment factor for deviation from base size
 AFRV = Additive Flat Rate Variables
 MV = Multiplicative Variables

Depreciation Table

Base Year 2017			
Effective Age of Building	% Depr.	% Good	Effective Year Built
0	0	100	2017
1	1	99	2016
2	2	98	2015
3	2	98	2014
4	3	97	2013
5	3	97	2012
6	4	96	2011
7	4	96	2010
8	4	96	2009
9	4	96	2008
10	5	95	2007
11	5	95	2006
12	5	95	2005
13	5	95	2004
14	6	94	2003
15	6	94	2002
16	6	94	2001
17	6	94	2000
18	6	94	1999
19	7	93	1998
20	7	93	1997
21	7	93	1996
22	7	93	1995
23	7	93	1994
24	8	92	1993
25	8	92	1992
26	8	92	1991
27	8	92	1990
28	8	92	1989
29	9	91	1988
30	9	91	1987
31	9	91	1986
32	9	91	1985
33	9	91	1984
34	9	91	1983
35	10	90	1982
36	10	90	1981
37	10	90	1980
38	10	90	1979
39	10	90	1978
40	10	90	1977
41	11	89	1976
42	11	89	1975
43	11	89	1974
44	11	89	1973
45	11	89	1972

46	11	89	1971
47	12	88	1970
48	12	88	1969
49	12	88	1968
50	12	88	1967
51	12	88	1966
52	12	88	1965
53	12	88	1964
54	13	87	1963
55	13	87	1962
56	13	87	1961
57	13	87	1960
58	13	87	1959
59	13	87	1958
60	14	86	1957
61	14	86	1956
62	14	86	1955
63	14	86	1954
64	14	86	1953
65	14	86	1952
70	15	85	1947
75	16	84	1942

2018 CAMA Commercial Construction Valuation Guideline -- RPAD

CONSTRUCTION DETAIL

Section Detail

No. Description Value

Building Stories

As Indicated.

Occupancy

As Indicated.
Select from list.

Stories and #Units

As Indicated.

Structure Class

0 Default
A Fireproof Steel
B Reinforced Concrete
C Con. Block/Solid Brick
D Wood Frame
P Wood Pole
S Steel/Sheet Metal

Exterior Finish

0 Typical
AS Asphalt Siding
BR Brick (Solid)
BV Brick Veneer
C Concrete
CB Concrete Block
MS Metal Siding
S Stone
SU Stucco
SV Stone Veneer
WS Wood Siding

Grade (Multiplies Base, Features)

0 Default --
0 Poor Quality -30%
15 Poor+ Quality -20%
20 Fair Quality -10%
25 Fair+ Quality -05%
30 Average Quality --
35 Average+ Quality 06%
40 Good Quality 12%
45 Good+ Quality 21%
50 Very Good Quality 30%
55 Very Good + Quality 38%
60 Excellent 45%

Story Height (Multiplies Base)

Currently not in use

Wall Height (Adds to Base Rate)

Currently not in use

CDU Condition, Desirability, Utility (Multiplies Base, Features)

EX Excellent 35%
VG Very Good 30%
G Good 15%
AV Average --
F Fair -25%
P Poor -50%
VP Very Poor -70%
US Unsound -90%

DEPRECIATION DETAIL

No. Description Value

Structure Class (Adjust EYB)

0 Default 0
A Fireproof Steel -20%
B Reinforced Conc. -15%
C Con. Block/Brick -10%
D Wood Frame 0
S Steel/Sheet Metal 0

Remodel Rating (Adjusts EYB)

0 Default --
1 Unknown -10%
2 Gut Rehab -70%
3 Major Renovation -55%
4 Remodel -45%
5 Addition -30%
6 Cosmetic -10%

Year Remodeled (Adjust EYB)

2013-2016 0%
2011-2012 5%
2006-2010 15%
2001-2005 25%
Earlier-2000 50%

Extra Features (Flat and Sq Ft Add)

BL Balcony Flat
ELEV Elevators Flat
HVAC Heat & Cool Sq. Ft.
MZ Mezzanines Sq. Ft.
SPRK Sprinklers Sq. Ft.

$$\text{Building RCN} = [\text{Section}_1 (\text{Base Rate} * \text{Effective Area} * \text{Size Adjustment}) * (\text{MV}_0 * \text{MV}_2 * \dots * \text{MV}_N)] + [\text{Section}_n (\text{Base Rate} * \text{Effective Area} * \text{Size Adjustment}) * (\text{MV}_0 * \text{MV}_2 * \dots * \text{MV}_N)] + [\text{Special Building Features}]$$

Where:

RCN = Replacement Cost New
Base Rate = \$ rate based on occupancy (use) code and construction class

Section_n = Each separate building or section of building

Effective Area = Adjusted SF area of improvement

Size Adjustment = Adjustment factor for deviation from base size

MV = Multiplicative Variables

2018 Economic Life Depreciation Tables

Age of Building	Effective Year Built
0	2017
1	2016
2	2015
3	2014
4	2013
5	2012
6	2011
7	2010
8	2009
9	2008
10	2007
11	2006
12	2005
13	2004
14	2003
15	2002
16	2001
17	2000
18	1999
19	1998
20	1997
21	1996
22	1995
23	1994
24	1993
25	1992
26	1991
27	1990
28	1989
29	1988
30	1987
31	1986
32	1985
33	1984
34	1983
35	1982
36	1981
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54	1963
55	1962
56	1961
57	1960
58	1959
59	1958
60	1957
61	1956
62	1955
63	1954
64	1953
65	1952
70	1950

70 Year Economic Life	
Percent of Depreciation	Percent Good
0	100
0	100
0	100
0	100
1	99
1	99
1	99
1	99
2	98
2	98
2	98
2	98
3	97
3	97
3	97
4	96
4	96
4	96
5	95
5	95
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17	83
18	82
19	81
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23	77
25	75
26	74
28	72
29	71
31	69
32	68
34	66
36	64
38	62
40	60
42	58
44	56
46	54
48	52
50	50
52	48
54	46
56	44
57	43
59	41
61	39
63	37
64	36
65	35
71	29

60 Year Economic Life	
Percent of Depreciation	Percent Good
0	100
0	100
0	100
1	99
1	99
1	99
1	99
2	98
2	98
2	98
2	98
3	97
3	97
3	97
4	96
4	96
5	95
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18	82
20	80
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23	77
25	75
26	74
28	72
31	69
32	68
34	66
36	64
38	62
40	60
44	56
46	54
48	52
50	50
52	48
54	46
57	43
59	41
61	39
63	37
64	36
65	35
67	33
69	31
70	30
71	29

50 Year Economic Life	
Percent of Depreciation	Percent Good
0	100
0	100
0	100
1	99
1	99
1	99
1	99
1	99
2	98
2	98
2	98
3	97
3	97
4	96
4	96
5	95
5	95
6	94
7	93
7	93
9	91
9	91
10	90
12	88
13	87
15	85
16	84
17	83
19	81
20	80
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26	74
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36	64
38	62
42	58
44	56
48	52
50	50
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71	29

2018 Cost Occupancy / Use Codes

Occ. Code	Land Class	Description	Bldg. Model	Bldg. Occ.	Cost Group	Cost Adjustment	Size Adj. Table	Standard Size	Standard Wall Height	Wall Height Adjustment	Run Cost?
001	C	Non-conform residential-single	94	001	RH1	1	S90	2000	8	0.015	1
002	R	Non-conform residential-multi-	03	002	AP1	1	S90	1500	8	0.02	1
003	R	Residential Transient	05	003	RH1	1	S90	8000	10	0.015	1
004	C	Commercial-Retail (NC)	94	004	RT1	1	S90	5000	12	0.01	1
005	C	Commercial-Office (NC)	94	005	OF1	1	S90	6000	10	0.015	1
006	C	Commercial-Spec Purpose (NC)	94	006	GS1	1	S90	6000	8	0.015	1
007	C	Industrial (NC)	96	007	MN2	1	S90	20000	8	0.015	1
008	C	Special Purpose (NC)	94	008	GS1	1	S90	8000	8	0.015	1
011	R	Residential Row Single Family	01	011	R11	1	SG3	1800	8	0.015	1
012	R	Residential Detached Single Fa	01	012	R12	1	SG3	1800	8	0.015	1
013	R	Residential-Semi-Detached Sing	01	013	R13	1	SG3	1800	8	0.015	1
014	R	Residential Garage	00	014		1	S90	10000	0	0.015	1
015	R	Residential-Mixed Use	01	015	R15	1	SG3	1800	8	0.02	1
016	R	Residential-Condo-Horizontal	05	016	CND	1	S90	1000	8	0.015	1
017	R	Residential-Condo-Vertical	05	017	CON	1	CDU	800	8	0.015	1
018	R	Residential-Condo-Parking	00	018		1	S90	10000	8	0.015	1
019	R	Residential-Single Family-Misc	01	019	R19	1	SG3	1800	8	0.015	1
021	C	Residential Apartment-Walk-Up	94	021	AP1	1	S90	10000	8	0.02	1
022	C	Residential-Apartment-Elevator	94	022	AP2	1	S90	50000	8	0.015	1
023	R	Res Flats-Less than 5 Units	03	023	R23	1	SG4	3000	8	0.015	1
024	R	Res-Coverions less than 5 Uni	02	024	R24	1	SG3	1800	8	0.015	1
025	C	Res-Coverions 5 Units	94	025	MRC	1	S90	10000	8	0.02	1
026	C	Res-Cooperative-Horizo	94	026	AP2	1	S90	10000	8	0.015	1
027	C	Res-Cooperative-Verical	94	027	AP2	1	S90	50000	8	0.015	1
028	C	Res-Conversions-mr than 5	94	028	MRC	1	S90	20000	8	0.015	1
029	C	Res-Multi-family Misc	94	029	AP2	1	S90	50000	8	0.015	1
031	C	Hotel-Small	94	031	HT1	1	S90	20000	9	0.01	1
032	C	Hotel-Large	94	032	HT2	1	S90	135000	9	0.01	1
033	C	Motel	94	033	HT1	0.8	S90	20000	9	0.01	1
034	C	Private Club	94	034	GS1	1	S90	4000	14	0.015	1
035	C	Tourist Homes	94	035	RH1	1	S90	8000	10	0.015	1
036	C	Dormitory	94	036	RH2	1	S90	8000	8	0.015	1
037	C	Inn	94	037	MRC	1	S90	12000	10	0.01	1
038	C	Fraternity/Sorority House	94	038	RH2	1	S90	8000	10	0.015	1
039	C	Res-Transient Misc	94	039	RH1	1	S90	5000	8	0.015	1
041	C	Store-Small 1 Story	94	041	RT1	1	S90	10000	14	0.01	1
042	C	Store-Misc	94	042	RT1	1	S90	4000	14	0.01	1
043	C	Store-Department	94	043	RT3	1	S90	40000	14	0.01	1
044	C	Store-Shopping Center/Mall	94	044	RT2	1	S90	60000	18	0.01	1
045	C	Store-Restaurant	94	045	RS1	1	S90	5000	12	0.01	1
046	C	Store-Barber/Beauty Shop	94	046	RT4	1	S90	4000	14	0.01	1
047	C	Store-Super Market	94	047	RT2	0.88	S90	22000	14	0.01	1
048	C	Commer-Retail-Condo	94	048	RT1	1	S90	3000	14	0.01	1
049	C	Commer-Retail-Misc	94	049	RT1	1	S90	4000	14	0.01	1
051	C	Commercial-Office-Small	94	051	OF1	1	S90	6000	10	0.015	1
052	C	Commercial-Office-Large	94	052	OF3	1	S90	60000	10	0.015	1
053	C	Commercial-Planned-Development	94	053	OF3	1	S90	300000	10	0.015	1
056	C	Office-Condo-Horizontal	94	056	OF1	1	S90	3000	10	0.015	1
057	C	Office-Condo-Vertical	94	057	OF1	1	S90	3000	10	0.015	1
058	C	Commercial-Office-Condo	94	058	OF3	1	S90	6000	10	0.015	1
059	C	Commercial-Office-Misc	94	059	OF2	1	S90	6000	10	0.015	1
061	C	Commercial-Banks_Financial Svc	94	061	BN1	1	S90	3000	14	0.015	1

2018 Cost Occupancy / Use Codes

Occ. Code	Land Class	Description	Bldg. Model	Bldg. Occ.	Cost Group	Cost Adjustment	Size Adj. Table	Standard Size	Standard Wall Height	Wall Height Adjustment	Run Cost?
062	C	Commercial-Garage_ Vehicle Sal	94	062	PK1	1	S90	5000	8	0.015	1
063	C	Commercial-Parking Garage	94	063	PK2	1	S90	55000	8	0.015	1
064	C	Parking Lot Special Purpose	00	064		1	S90	25000	0	0	1
065	C	Vehicle Svc Station_ Vintage	94	065	SV1	1	S90	5000	12	0.01	1
066	C	Theaters_ Entertainment	94	066	GS2	1	S90	20000	22	0.01	1
067	C	Commercial-Restaurant	94	067	RS1	1	S90	5000	12	0.01	1
068	C	Commercial-Restaurant-Fast Foo	94	068	RS2	1.1	S90	3000	12	0.01	1
069	C	Commercial-Specific Purpose	94	069	RT1	1	S90	10000	14	0.01	1
071	C	Industrial-Raw Material	94	071	MN1	1	S90	15000	14	0.015	1
072	C	Industrial-Heavy Manufacturing	94	072	MN2	1	S90	30000	12	0.015	1
073	C	Industrial-Light	94	073	MN1	1	S90	22000	12	0.015	1
074	C	Industrial-Warehouse-1-story	94	074	WH2	1	S90	25000	16	0.01	1
075	C	Industrial-Warehouse-Multistor	94	075	WH1	1	S90	20000	16	0.01	1
076	C	Industrial-Truck Teminal	94	076	WH3	1	S90	20000	16	0.01	1
078	C	Warehouse-Condo	94	078	WH2	1	S90	5000	16	0.01	1
079	C	Industrial -Misc	94	079	MN1	1	S90	22000	12	0.015	1
081	C	Religious	94	081	PS1	1	S90	15000	24	0.01	1
082	C	Medical	94	082	MC1	1	S90	15000	10	0.01	1
083	C	Educational	94	083	ED1	1	S90	80000	12	0.01	1
084	C	Public Service	94	084	PS1	1	S90	12000	12	0.01	1
085	C	Embassy_ Chancery	94	085	PS2	1	S90	12000	12	0.01	1
086	C	Museum_ Library_ Gallery	94	086	GS3	1	S90	14000	14	0.01	1
087	C	Recreational	94	087	RB1	1	S90	20000	24	0.01	1
088	C	Healthcare Facility	94	088	MC2	1	S90	8000	12	0.01	1
089	C	Special Purpose	94	089	GS2	1	S90	2000	8	0.01	1
091	R	Vacant	00	091		1	S90		0	0.015	1
092	R	Vacant-with permit	00	092		1	S90		0		1
093	R	Vacant-zoning limits	00	093		1			0		1
094	R	Vacant-false abutting	00	094		1			0		1
095	R	Vacant-Commercial Use	00	095		1			0		1
096	R	Vacant-Unimproved Parking	00	096		1			0		1
116	R	Condo-Horizontal Combined	05	116	CND	1	S90	3000	8	0.015	1
117	R	Condo-Vertictal Combined	05	117	CND	1	S90	2000	8	0.015	1
126	C	Coop-Horizontal-Mixed Use	94	126	AP2	1	S90	10000	8	0.01	1
127	C	Coop-Vertical-Mixed Use	94	127	AP2	1	S90	10000	8	0.01	1
165	C	Vehicle Svc Station_ Kiosk	94	165	SS1	1	S90	5000	14	0.01	1
189	C	Special Purpose-Memorial	00	189		1	S90	10000	0	0.01	1
191	C	Vacant	00	191		1					1
192	C	Vacant-with permit	00	192		1					1
193	C	Vacant-zoning limits	00	193		1					1
194	C	Vacant-false abutting	00	194		1					1
195	C	Vacant-Commercial Use	00	195		1					1
196	C	Vacant-Unimproved Parking	00	196		1					1
214	C	Garage-Multi-family	00	214		1	S90	10000	0	0.015	1
216	C	Condo-Investment-Horizontal	94	216	CND	1	S90	10000	8	0.015	1
217	C	Condo-Investment-Vertical	94	217	CND	1	S90	50000	8	0.015	1
265	C	Vehicle Svc Station_ Kiosk	94	265	SS1	1	S90	5000	12	0.01	1
316	R	Condo-Duplex	05	316	CND	1	S90	5000	8	0.015	1
365	C	Vehicle Svc Station_ Market	94	365	SS2	1	S90	5000	12	0.01	1
417	R	Condo-Vertical-Parking-Unid	00	417		1		2000	0		1
465	C	Vehicle Svc Station_ Market	94	465	SS2	1	S90	5000	14	0.01	1
516	R	Condo-Detached	01	516	SIN	1	S90	2000	8	0.015	1

Use Codes

Code Description	Long Description
001 Residential-Single Family (NC)	(CLASS 1): Single-family residential property which normally would receive a use code, 11-19, 23-24 but has non-conforming use. (Assigned to Commercial)
002 Residential-Multi-Family (NC)	(CLASS 1): Multi-family residential property which normally would receive a use code, 21-22 or 25-29, but has a non-conforming use. (Assigned to Residential)
003 Residential-Transient (NC)	(CLASS 1): Transient residential property which normally would receive a use code, 31-39, but has a non-conforming use. (Assigned to Residential)
004 Commercial-Retail (NC)	(CLASS 2): Retail commercial property which normally would receive a use code, 41-49, but has non-conforming use. (Assigned to Residential)
005 Commercial-Office (NC)	(CLASS 2): Commercial office property which normally would receive a use code, 51-53, 57-59, but has non-conforming use. (Assigned to Residential)
006 Commercial-Specific Purpose (NC)	(CLASS 2): Commercial property which normally would receive a specific purpose use code, 61-69, but has non-conforming use. (Assigned to Residential)
007 Industrial (NC)	(CLASS 2): Industrial property which normally would receive a use code, 71-79, but has non-conforming use. (Assigned to Residential)
008 Special Purpose (NC)	(CLASS 2): Special purpose property which normally would receive a use code, 81-89, but has non-conforming use. (Assigned to Residential)
011 Residential-Row-Single-Family	(CLASS 1): Single-family dwelling with 2 walls built as common walls with another structure, 2 exposed walls; primarily used as place of abode.
012 Residential-Detached-Single-Fa	(CLASS 1): Free-standing dwelling with open space around it and in all exterior walls; primarily used as abode.
013 Residential-Semi-Detached-Sing	(CLASS 1): Structure with 1 dwelling place, 1 wall built as common wall with another structure, 3 exposed walls; primarily used as abode.
014 Residential-Garage	(CLASS 1): Structure used primarily as accessory to single-family residence; no living quarters; on an individual lot. Garages, pools, tennis courts, pads, etc.
015 Residential-Mixed Use	(CLASS 1 or 2): Single-family property with commercial (usually office) space in part of house. If use is mostly single-family, lot may be eligible for a Homestead Deduction. Mixed-use eligible.
016 Residential-Condo-Horizontal	(CLASS 1): Enclosed space of 1 or more rooms, occupying all or part of 1 or more floors; entrance no higher than 3 floors; single-family use; may/may not have parking, laundry, patio, etc.
017 Residential-Condo-Vertical	(CLASS 1): Enclosed space of 1 or more rooms, occupying all/part of 1 or more floors; in structure with elevator; more than 3 floors. Original primary use single-family. May have parking, laundry, patio, etc.
018 Residential-Condo-Garage	(CLASS 1): Specific space, enclosed or not, for vehicle parking or storage; use is accessory to single-family residential; no living quarters; individually located to be freely exchanged independently of another unit.
019 Residential-Single-Family-Misc	(CLASS 1): All other residential-single family uses not otherwise coded.
021 Residential-Apartment-Walk-Up	(CLASS 1): Structure of 6 or more units; 1 owner; owner's motivation is to earn net investment income; no units higher than 3rd floor; no elevator; may have accessory uses.
022 Residential-Apartment-Elevator	(CLASS 1): Structure with 12 or more units; 1 owner; elevator, more than 3 floors; may have accessory uses (parking, laundry, etc.). Owner's motivation is investment income.
023 Residential Flats-Less than 5	(CLASS 1): Structure with more than 1 single family unit, less than 5; usually self-contained, under 1 roof; few accessory uses; in some cases, owner occupies 1 unit; built for this use.
024 Residential-Conversions-Less t	(CLASS 1): Structure with more than 1 single-family unit, but less than 5; usually self-contained, under 1 roof; few accessory uses; 1 unit may be owner-occupied; original primary use not multi-family.
025 Residential-Conversion-5 Units	(CLASS 1): Structure with 5 units, usually not self-contained but under 1 roof; with few accessory uses; 1 unit may be owner-occupied; original primary use not multi-family.
026 Residential-Cooperative-Horizontal	(Class 1): Structure with more than 1 unit, of 1 or more rooms; 1 corporate ownership accounts for benefit of all tenant-shareholders, or lease from shareholders; entrance no higher than 3 floors; may have accessory uses.
027 Residential-Cooperative-Vertical	(Class 1): Structure with more than 1 unit, each with 1 or more rooms; 1 corporate ownership accounts for benefit of all tenant-shareholders; lease from shareholders; elevator; more than 3 floors; may have accessory uses.
029 Residential-Multifamily, Misc	(CLASS 1 or 2): All other residential multi-family uses not otherwise noted. Mixed-use eligible.
031 Hotel-Small	(CLASS 2): Structure providing a temporary or semi-permanent residence; sleep accommodations, personal services, usually eating/drinking facilities; may include entertainment; 150 rooms or less.

Use Codes

Code	Description	Long Description
032	Hotel-Large	(CLASS 2): Structure providing temporary or semi-permanent residences; full personal services; eating/drinking facilities, entertainment, retail, banquet /conference capabilities; more than 150 rooms.
033	Motel	(CLASS 2): Structure used primarily as temporary residence; may include personal services, restaurant facilities, adequate parking; sleep accommodations may be open to building's exterior.
034	Club-Private	(CLASS 2): Structure used primarily as meeting place for members of an association organized for promotion of a common social/other objective; limited to members/guests. May include meals, residential suites. Mixed-use eligible.
035	Tourist Homes	(CLASS 2): Structure or part-structure used primarily for temporary sleep accommodations; no other services; may provide limited parking.
036	Dormitory	(CLASS 2): Structure or part-structure used as resident hall with sleep accommodations; may provide other services, such as food/beverage facilities.
037	Inn	(CLASS 2): Structure used primarily as a temporary residence. Rooms/suites may include kitchens; no guest central dining other than continental breakfast. No commercial adjuncts, function rooms.
038	Fraternity/Sorority House	(CLASS 1): Resident hall with sleep accommodations; may provide other services, such as food/beverage facilities. Mixed-use eligible.
039	Residential-Transient, Misc	(CLASS 2): All other residential transient not otherwise coded.
041	Store-Small 1-Story	(CLASS 2): Structure used primarily for retail sales; row, attached, or detached; with/without accessory uses; with/without living quarters.
042	Store-Misc	(CLASS 2): Structure used primarily for ground-level retail sales; row, attached, or detached; with/without other uses; with/without living quarters. Mixed-use eligible.
043	Store-Department	(CLASS 2): Structure used primarily for sales of combination of retail products; no living quarters; except custodial staff. Mixed-use eligible.
044	Store-Shopping Center/Mall	(CLASS 2): Structure/combination of structures, enclosed/not; with combination of retail businesses located to present a unified cluster of similar uses with common elements: parking, entrances, pedestrian areas.
045	Store-Restaurant	(CLASS 2): Structure used primarily for retail sales of food/drink prepared for carry-out or on-site consumption; in row; with/without other uses. Mixed-use eligible.
046	Store-Barber/Beauty Shop	(CLASS 2): Structure used primarily for retail sales/individual grooming services; on ground level; row, attached, or detached; other uses may occupy parts. Mixed-use eligible.
047	Store-Super Market	(CLASS 2): Structure used primarily for retail grocery sales; ground level; row, attached, or detached; with/without accessory uses. Mixed-use eligible.
048	Commercial-Retail-Condo	(CLASS 2): Unit in a predominately residential condo complex used for retail sales/service business.
049	Commercial-Retail-Misc	(CLASS 2): All other retail commercial land uses not otherwise coded. Mixed-use eligible.
051	Commercial-Office-Small	(CLASS 2): Structure without elevators used primarily for offices; secondary use may be retail sales, services, parking.
052	Commercial-Office-Large	(CLASS 2): Structure with elevator; used predominantly for offices, secondarily for retail sales, services, parking.
053	Commercial-Planned Development	(CLASS 2): Structure/combination of structures designed to incorporate several coordinated commercial endeavors into 1 closely-grouped unit; may include mail, offices, theaters, hotels, etc. Mixed-use eligible.
056	Office-Condo-Horizontal	(CLASS 2): Structure with more than 1 unit; entrance no higher than 3 floors above ground level; designed primarily for office use; may have accessory uses such as parking, etc.
057	Office-Condo-Vertical	(CLASS 2): Structure with more than 1 unit, elevator, and more than 3 floors; designed primarily for office use; accessory uses such as parking, etc.
058	Commercial-Office-Condo	(CLASS 2): Unit in a predominantly residential condo complex used as a commercial office. Mixed-use eligible.
059	Commercial-Office-Misc.	(CLASS 2): All other commercial office uses which have not been otherwise coded. Mixed-use eligible.
061	Commercial-Banks, Financial	(CLASS 2): Structure with service facility devoted to transactions dealing with money as a commodity.
062	Commercial-Garage, Vehicle Sale	(CLASS 2): Structure with facility for motor vehicle repairs; devoted to retail/ wholesale motor vehicle sales.
063	Commercial-Parking Garage	(CLASS 2): Structure used primarily for public storage of motor vehicles; repair, greasing, washing, or similar services incidental uses.
064	Parking Lot-Special Purpose	(CLASS 2): Lot used primarily for public storage of motor vehicles; any repair is incidental use; may have attendance booth, storage lifts, residential parking space if on separate lot/paved.

Use Codes

Code Description	Long Description
065 Vehicle Service Station-Vintage	(CLASS 2): Structure used for retail sale of motor fuel, lubricants. Incidental services such as lubrication, hand-car washing; sale, installation, minor repair of tires, batteries, other auto accessories.
066 Theaters, Entertainment	(CLASS 2): Structure with primary use for live, on-screen, or audience-participation entertainment.
067 Commercial-Restaurant	(CLASS 2): Structure used primarily as public eating place for retail sale of food/drink prepared/consumed on-site; secondary accessory uses.
068 Commercial-Restaurant-Fast Food	(CLASS 2): Structure used for retail sale of food/drink (non-alcoholic), cooked/heated in-structure for carry-out or on-site, usually specializing in a particular food.
069 Commercial-Specific Purpose, Misc	(CLASS 2): All other specific purpose commercial uses not otherwise coded. Mixed-use eligible.
071 Industrial-Raw Material Handling	(CLASS 2) : Property used primarily to receive, store, handle, ship industrial bulk raw material, normally processed/used at another location.
072 Industrial-Heavy Manufacturing	(CLASS 2): Structure containing processing/manufacturing equipment which handles raw material; may change the material into a finished product for public use or for assembly operation; use limited to structure.
073 Industrial-Light	(CLASS 2): Structure used to process, assemble, or manufacture raw, semi-finished, or finished materials, and/or completed components; use not limited to structure.
074 Industrial-Warehouse-1-Story	(CLASS 2): Structure used primarily to store materials/finished products; unlimited story height; accessory uses: office and/or retail-wholesale display area, parking.
075 Industrial-Warehouse-Multi-Story	(CLASS 2): Structure used primarily to store materials/finished products; 2 or more floors devoted to structure's primary use; accessory office and retail-wholesale display area.
076 Industrial-Truck Terminal	(CLASS 2): Structure used primarily to store (short-term) and transfer (turn-around) materials/finished products shipped by truck; raised truck level bays for receiving/shipping; accessory office.
078 Warehouse-Condo	(CLASS 2): Structure used primarily to store materials/finished products; unlimited story height, 2 or more floors; accessory office and/or retail/wholesale display area.
079 Industrial-Misc	(CLASS 2): All other industrial uses not otherwise coded. Mixed-use eligible.
081 Religious	(CLASS 2): Structure devoted to public worship; housing for and/or education of clergy/officials connected to religious activity; religious communities.
082 Medical	(CLASS 2): Structure devoted to public/private medical or surgical care to the sick or injured; outpatient diagnosis/treatment; education of medical personnel/officials.
083 Educational	(CLASS 2): Structure devoted to any level of public/private instruction. May include administrative, accessory functions; parking, retail sales, secondary use.
084 Public Service	(CLASS 2): Structure used primarily to serve public to protect people or property; utility service; other public service. Accessory uses are secondary.
085 Embassy, Chancery, etc.	(CLASS 2): Structure used primarily as offices of an ambassador or foreign government. Accessory uses secondary.
086 Museum, Library, Gallery	(CLASS 2): Structure for exhibition, display, storage of art works, other displayable chattels; usually open for public enjoyment; accessory uses (parking, retail sales).
087 Recreational	(CLASS 2): Facility primarily used for public viewing of sporting events, training/participation in recreational activities, or any other special sporting or leisure activity.
088 Health Care Facility	(CLASS 2): Structure devoted to public/private medical care/treatment of the sick or injured; may include other medically connected activities, other uses (retail sales, parking).
089 Special Purpose-Misc	(CLASS 2): All other special purpose uses not otherwise coded. Mixed-use eligible.
091 Vacant-True	(Class 1): Lot not improved with a structure and Residential vacant land (formerly Class 3).
092 Vacant-with Permit	(CLASS 1): Lot for which an unexpired building permit has been issued.
093 Vacant-Zoning Limits	(CLASS 1): Lot on which DC Zoning regulations prohibit an owner to build as a matter of right or lot with deed or covenant restrictions precluding buildings.
094 Vacant-False-Abutting	(CLASS 1): Lot assigned no real estate improvement value, but having part of a structure whose value is assigned to another lot. Mixed-use eligible.
095 Vacant-Residential Use	(CLASS 1): Lot with relatively permanent structures (storage tanks, railroad tracks), but not buildings, used for residential purposes, making the lot unbuildable.

2018 Base Cost Rates

Cost Group	Class	Base Rate	Depr. Table	Econ. Life	Max. Depr.	Max. Age
AP1	0	\$119.92	5	60	80	99
AP1	A	\$123.38	5	70	80	99
AP1	B	\$128.10	5	70	80	99
AP1	C	\$119.92	5	60	80	99
AP1	D	\$119.13	5	50	80	99
AP1	S	\$112.45	5	50	80	99
AP2	0	\$144.77	5	60	80	99
AP2	A	\$193.85	5	70	80	99
AP2	B	\$188.97	5	70	80	99
AP2	C	\$144.77	5	60	80	99
AP2	D	\$134.35	5	50	80	99
BN1	0	\$324.31	5	60	80	99
BN1	A	\$393.45	5	70	80	99
BN1	B	\$375.79	5	70	80	99
BN1	C	\$324.31	5	60	80	99
BN1	D	\$298.71	5	50	80	99
BN1	S	\$278.22	5	50	80	99
BS1	0	\$197.31	5	60	80	99
BS1	A	\$257.22	5	70	80	99
BS1	B	\$229.03	5	70	80	99
BS1	C	\$197.31	5	60	80	99
BS1	D	\$179.70	5	50	80	99
BS1	S	\$70.47	5	50	80	99
CD	R	\$132.13	5	99	80	99
CND	0	\$294.88	5	50	80	99
CND	A	\$294.88	5	50	80	99
CND	B	\$294.88	5	50	80	99
CND	C	\$294.88	5	50	80	99
CND	D	\$294.88	5	50	80	99
CND	R	\$294.88	5	50	80	99
CND	S	\$294.88	5	50	80	99
CW1	0	\$162.08	5	60	80	99
CW1	A	\$192.04	5	70	80	99
CW1	B	\$183.22	5	70	80	99
CW1	C	\$162.08	5	60	80	99
CW1	D	\$144.47	5	50	80	99
CW1	S	\$144.47	5	50	80	99
ED1	0	\$191.61	5	60	80	99
ED1	A	\$258.76	5	70	80	99
ED1	B	\$257.72	5	70	80	99
ED1	C	\$191.61	5	60	80	99
ED1	D	\$182.62	5	50	80	99
ED1	S	\$182.77	5	50	80	99
GEN	0	\$169.13	5	60	80	99
GEN	A	\$234.47	5	70	80	99
GEN	B	\$215.25	5	70	80	99
GEN	C	\$169.13	5	60	80	99
GEN	D	\$144.14	5	50	80	99
GEN	S	\$144.14	5	50	80	99
GS1	0	\$227.49	5	60	80	99
GS1	A	\$236.12	5	70	80	99
GS1	B	\$238.36	5	70	80	99
GS1	C	\$227.49	5	60	80	99
GS1	D	\$216.65	5	50	80	99
GS1	S	\$151.58	5	50	80	99
GS2	0	\$204.61	5	60	80	99

2018 Base Cost Rates

Cost Group	Class	Base Rate	Depr. Table	Econ. Life	Max. Depr.	Max. Age
GS2	A	\$324.92	5	70	80	99
GS2	B	\$306.78	5	70	80	99
GS2	C	\$204.61	5	60	80	99
GS2	D	\$191.24	5	50	80	99
GS2	S	\$186.27	5	50	80	99
GS3	0	\$221.45	5	60	80	99
GS3	A	\$311.97	5	70	80	99
GS3	B	\$307.19	5	70	80	99
GS3	C	\$221.45	5	60	80	99
GS3	D	\$203.86	5	50	80	99
GS3	S	\$197.54	5	50	80	99
HT1	0	\$149.97	5	60	80	99
HT1	A	\$177.70	5	70	80	99
HT1	B	\$175.86	5	70	80	99
HT1	C	\$149.97	5	60	80	99
HT1	D	\$139.86	5	50	80	99
HT1	S	\$110.04	5	50	80	99
HT2	0	\$240.02	5	60	80	99
HT2	A	\$242.06	5	70	80	99
HT2	B	\$240.02	5	70	80	99
HT2	C	\$187.27	5	60	80	99
HT2	D	\$173.94	5	50	80	99
HT2	S	\$233.47	5	50	80	99
MC1	0	\$340.37	5	60	80	99
MC1	A	\$444.24	5	70	80	99
MC1	B	\$442.66	5	70	80	99
MC1	C	\$340.37	5	60	80	99
MC1	D	\$310.54	5	50	80	99
MC1	S	\$176.55	5	50	80	99
MC2	0	\$220.59	5	60	80	99
MC2	A	\$278.67	5	70	80	99
MC2	B	\$274.83	5	70	80	99
MC2	C	\$220.59	5	60	80	99
MC2	D	\$202.38	5	50	80	99
MC2	S	\$220.59	5	50	80	99
MLT	R	\$96.34	5	70	80	70
MN1	0	\$83.47	5	60	80	99
MN1	A	\$94.61	5	70	80	99
MN1	B	\$93.27	5	70	80	99
MN1	C	\$83.47	5	60	80	99
MN1	D	\$74.89	5	50	80	99
MN1	S	\$75.11	5	50	80	99
MN2	0	\$180.66	5	60	80	99
MN2	A	\$234.72	5	70	80	99
MN2	B	\$236.56	5	70	80	99
MN2	C	\$180.66	5	60	80	99
MN2	D	\$117.14	5	50	80	99
MN2	S	\$168.87	5	50	80	99
MN4	0	\$186.75	5	60	80	99
MN4	A	\$237.84	5	70	80	99
MN4	B	\$204.36	5	70	80	99
MN4	C	\$186.75	5	60	80	99
MN4	D	\$172.65	5	50	80	99
MN4	S	\$172.65	5	50	80	99
MRC	0	\$143.42	5	75	40	75
MRC	A	\$143.42	5	75	40	75

2018 Base Cost Rates

Cost Group	Class	Base Rate	Depr. Table	Econ. Life	Max. Depr.	Max. Age
MRC	B	\$143.42	5	75	40	75
MRC	C	\$143.42	5	75	40	75
MRC	D	\$143.42	5	75	40	75
MRC	S	\$143.42	5	75	40	75
OF1	0	\$220.25	5	60	80	99
OF1	A	\$303.36	5	70	80	99
OF1	B	\$290.99	5	70	80	99
OF1	C	\$220.25	5	60	80	99
OF1	D	\$204.04	5	50	80	99
OF1	S	\$196.28	5	50	80	99
OF2	0	\$220.25	5	60	80	99
OF2	A	\$303.36	5	70	80	99
OF2	B	\$290.99	5	70	80	99
OF2	C	\$220.25	5	60	80	99
OF2	D	\$203.51	5	50	80	99
OF2	S	\$196.28	5	50	80	99
OF3	0	\$249.81	5	60	80	99
OF3	A	\$253.97	5	70	80	99
OF3	B	\$249.81	5	70	80	99
OF3	C	\$187.21	5	60	80	99
OF3	D	\$170.68	5	50	80	99
OF3	S	\$166.46	5	50	80	99
OFF	0	\$128.93	5	60	80	99
OFF	A	\$169.46	5	70	80	99
OFF	B	\$158.39	5	70	80	99
OFF	C	\$128.93	5	60	80	99
OFF	D	\$117.88	5	50	80	99
OFF	S	\$117.88	5	50	80	99
PK1	0	\$127.87	5	60	80	99
PK1	A	\$128.94	5	70	80	99
PK1	B	\$132.70	5	70	80	99
PK1	C	\$127.87	5	60	80	99
PK1	D	\$117.15	5	50	80	99
PK1	S	\$92.16	5	50	80	99
PK2	0	\$84.08	5	60	80	99
PK2	A	\$84.68	5	70	80	99
PK2	B	\$84.08	5	70	80	99
PK2	C	\$80.24	5	60	80	99
PK2	D	\$73.00	5	50	80	99
PK2	S	\$45.02	5	50	80	90
PS1	0	\$222.94	5	60	80	99
PS1	A	\$302.61	5	70	80	99
PS1	B	\$298.47	5	70	80	99
PS1	C	\$222.94	5	60	80	99
PS1	D	\$207.86	5	50	80	99
PS1	S	\$190.25	5	50	80	99
PS2	0	\$230.74	5	60	80	99
PS2	A	\$299.01	5	70	80	99
PS2	B	\$294.02	5	70	80	99
PS2	C	\$230.74	5	60	80	99
PS2	D	\$213.33	5	50	80	99
PS2	S	\$151.22	5	50	80	99
R11	R	\$137.12	6	75	80	75
R12	R	\$158.38	6	75	80	75
R13	R	\$138.41	6	75	80	75
R15	R	\$137.12	6	75	80	75

2018 Base Cost Rates

Cost Group	Class	Base Rate	Depr. Table	Econ. Life	Max. Depr.	Max. Age
R19	R	\$137.12	6	75	80	75
R23	R	\$112.25	6	75	80	75
R24	R	\$143.42	6	75	80	75
RB1	O	\$199.17	5	60	80	99
RB1	A	\$256.00	5	70	80	99
RB1	B	\$263.29	5	70	80	99
RB1	C	\$199.17	5	60	80	99
RB1	D	\$187.25	5	50	80	99
RB1	S	\$182.06	5	50	80	99
RES	R	\$96.10	5	70	80	70
RH1	O	\$148.94	5	70	80	99
RH1	A	\$148.94	5	70	80	99
RH1	B	\$148.94	5	70	80	99
RH1	C	\$148.94	5	70	80	99
RH1	D	\$148.94	5	70	80	99
RH1	S	\$148.94	5	70	80	99
RH2	O	\$207.37	5	60	80	99
RH2	A	\$271.62	5	70	80	99
RH2	B	\$263.77	5	70	80	99
RH2	C	\$207.37	5	60	80	99
RH2	D	\$191.46	5	50	80	99
RH2	S	\$142.38	5	50	80	99
RS1	O	\$224.18	5	60	80	99
RS1	A	\$296.64	5	70	80	99
RS1	B	\$296.64	5	70	80	99
RS1	C	\$224.18	5	60	80	99
RS1	D	\$206.78	5	50	80	99
RS1	S	\$206.75	5	50	80	99
RS2	O	\$241.80	5	60	80	99
RS2	A	\$327.38	5	70	80	99
RS2	B	\$327.38	5	70	80	99
RS2	C	\$241.80	5	60	80	99
RS2	D	\$222.72	5	50	80	99
RS2	S	\$223.81	5	50	80	99
RT1	O	\$150.83	5	60	80	99
RT1	A	\$192.03	5	70	80	99
RT1	B	\$184.13	5	70	80	99
RT1	C	\$150.83	5	60	80	99
RT1	D	\$140.30	5	50	80	99
RT1	S	\$139.60	5	50	80	99
RT2	O	\$145.77	5	60	80	99
RT2	A	\$170.04	5	70	80	99
RT2	B	\$170.04	5	70	80	99
RT2	C	\$145.77	5	60	80	99
RT2	D	\$134.23	5	50	80	99
RT2	S	\$133.50	5	50	80	99
RT3	O	\$231.24	5	60	80	99
RT3	A	\$240.70	5	70	80	99
RT3	B	\$231.24	5	70	80	99
RT3	C	\$189.03	5	60	80	99
RT3	D	\$222.82	5	50	80	99
RT3	S	\$227.08	5	50	80	99
RT4	O	\$144.02	5	60	80	99
RT4	A	\$143.86	5	70	80	99
RT4	B	\$143.86	5	70	80	99
RT4	C	\$144.02	5	60	80	99

2018 Base Cost Rates

Cost Group	Class	Base Rate	Depr. Table	Econ. Life	Max. Depr.	Max. Age
RT4	D	\$131.75	5	50	80	99
RT4	S	\$129.23	5	50	80	99
SIN	R	\$154.17	5	70	80	70
SS1	O	\$295.16	5	70	80	99
SS1	A	\$297.81	5	70	80	99
SS1	B	\$300.41	5	70	80	99
SS1	C	\$295.16	5	70	80	99
SS1	D	\$289.48	5	70	80	99
SS1	S	\$295.16	5	70	80	99
SS2	O	\$239.18	5	60	80	99
SS2	A	\$243.55	5	70	80	99
SS2	B	\$243.55	5	70	80	99
SS2	C	\$239.18	5	60	80	99
SS2	D	\$226.01	5	50	80	99
SS2	S	\$234.51	5	50	80	99
SV1	O	\$107.12	5	60	80	99
SV1	A	\$115.94	5	70	80	99
SV1	B	\$119.31	5	70	80	99
SV1	C	\$107.12	5	60	80	99
SV1	D	\$92.52	5	50	80	99
SV1	S	\$89.20	5	50	80	99
TM1	O	\$91.61	5	60	80	99
TM1	A	\$112.75	5	70	80	99
TM1	B	\$102.18	5	70	80	99
TM1	C	\$91.61	5	60	80	99
TM1	D	\$84.57	5	50	80	99
TM1	S	\$84.57	5	50	80	99
UT1	O	\$160.32	5	60	80	99
UT1	A	\$181.47	5	70	80	99
UT1	B	\$169.13	5	70	80	99
UT1	C	\$160.32	5	60	80	99
UT1	D	\$137.42	5	50	80	99
UT1	S	\$137.42	5	50	80	99
WH1	O	\$85.74	5	60	80	99
WH1	A	\$125.10	5	70	80	99
WH1	B	\$124.70	5	70	80	99
WH1	C	\$85.74	5	60	80	99
WH1	D	\$75.02	5	50	80	99
WH1	S	\$76.01	5	50	80	99
WH2	O	\$72.21	5	60	80	99
WH2	A	\$106.66	5	70	80	99
WH2	B	\$105.37	5	70	80	99
WH2	C	\$72.21	5	60	80	99
WH2	D	\$63.42	5	50	80	99
WH2	S	\$64.16	5	50	80	99
WH3	O	\$99.73	5	60	80	99
WH3	A	\$99.64	5	70	80	99
WH3	B	\$104.50	5	70	80	99
WH3	C	\$113.20	5	60	80	99
WH3	D	\$69.42	5	50	80	99
WH3	S	\$99.73	5	50	80	99

Real Property Assessment Division
2018 Base Change
RESIDENTIAL (Class 1)

Neighborhood	Name	Total Base			
		2017	2018	Difference	% Change
001	American University Park	\$2,354,274,800	\$2,445,358,500	\$91,083,700	3.87%
002	Anacostia	\$551,332,060	\$582,858,405	\$31,526,345	5.72%
003	Barry Farms	\$261,607,220	\$281,399,200	\$19,791,980	7.57%
004	Berkley	\$1,303,079,440	\$1,336,587,570	\$33,508,130	2.57%
005	Brentwood	\$470,452,490	\$509,872,250	\$39,419,760	8.38%
006	Brightwood	\$2,304,028,452	\$2,449,920,800	\$145,892,348	6.33%
007	Brookland	\$3,481,658,824	\$3,765,978,457	\$284,319,633	8.17%
008	Burleith	\$834,698,510	\$853,512,640	\$18,814,130	2.25%
009	Capitol Hill	\$3,535,794,993	\$3,637,215,940	\$101,420,947	2.87%
010	Central	\$5,694,654,304	\$5,984,723,650	\$290,069,346	5.09%
011	Chevy Chase	\$5,327,034,479	\$5,485,661,150	\$158,626,671	2.98%
012	Chillum	\$429,225,730	\$448,608,180	\$19,382,450	4.52%
013	Cleveland Park	\$2,699,775,540	\$2,827,145,350	\$127,369,810	4.72%
014	Colonial Village	\$572,068,830	\$580,723,090	\$8,654,260	1.51%
015	Columbia Heights	\$6,291,097,694	\$6,569,097,410	\$277,999,716	4.42%
016	Congress Heights	\$1,374,199,826	\$1,437,759,550	\$63,559,724	4.63%
017	Crestwood	\$743,862,500	\$783,772,020	\$39,909,520	5.37%
018	Deanwood	\$1,476,100,694	\$1,592,734,580	\$116,633,886	7.90%
019	Eckington	\$1,593,020,140	\$1,645,779,550	\$52,759,410	3.31%
020	Foggy Bottom	\$1,410,211,017	\$1,471,061,270	\$60,850,253	4.31%
021	Forest Hills	\$2,878,075,060	\$3,029,775,720	\$151,700,660	5.27%
022	Fort Dupont Park	\$898,611,900	\$992,461,640	\$93,849,740	10.44%
023	Foxhall	\$315,842,400	\$328,002,360	\$12,159,960	3.85%
024	Garfield	\$1,561,906,720	\$1,634,792,360	\$72,885,640	4.67%
025	Georgetown	\$5,500,091,168	\$5,701,419,426	\$201,328,258	3.66%
026	Glover Park	\$1,413,200,120	\$1,482,446,270	\$69,246,150	4.90%
027	Hawthorne	\$287,747,700	\$296,931,560	\$9,183,860	3.19%
028	Hillcrest	\$1,134,397,424	\$1,256,826,589	\$122,429,165	10.79%
029	Kalorama	\$3,506,610,700	\$3,643,982,800	\$137,372,100	3.92%
030	Kent	\$1,300,885,240	\$1,334,477,870	\$33,592,630	2.58%
031	LeDroit Park	\$1,223,134,522	\$1,335,211,840	\$112,077,318	9.16%
032	Lily Ponds	\$387,972,770	\$410,508,630	\$22,535,860	5.81%
033	Marshall Heights	\$392,529,630	\$434,051,370	\$41,521,740	10.58%
034	Massachusetts Av Heights	\$680,615,110	\$693,471,140	\$12,856,030	1.89%
035	Michigan Park	\$394,353,820	\$419,375,320	\$25,021,500	6.34%
036	Mount Pleasant	\$3,624,223,556	\$3,796,703,600	\$172,480,044	4.76%
037	North Cleveland Park	\$953,589,788	\$1,001,105,100	\$47,515,312	4.98%
038	Observatory Circle	\$1,557,889,835	\$1,620,181,689	\$62,291,854	4.00%
039	Old City I	\$10,767,730,409	\$11,212,151,190	\$444,420,781	4.13%
040	Old City II	\$14,237,490,383	\$15,325,313,347	\$1,087,822,964	7.64%
041	Palisades	\$1,167,568,255	\$1,221,441,770	\$53,873,515	4.61%
042	Petworth	\$3,002,814,935	\$3,388,727,930	\$385,912,995	12.85%
043	Randle Heights	\$1,123,620,420	\$1,200,231,910	\$76,611,490	6.82%
044	NoMa	\$749,847,290	\$763,140,770	\$13,293,480	1.77%
046	SW Waterfront	\$1,862,002,135	\$2,009,138,118	\$147,135,983	7.90%
047	Riggs Park	\$1,046,454,490	\$1,163,188,240	\$116,733,750	11.16%
048	Shepherd Park	\$694,790,600	\$732,306,280	\$37,515,680	5.40%
049	Sixteenth Street Heights	\$1,398,546,000	\$1,521,820,160	\$123,274,160	8.81%
050	Spring Valley	\$1,539,896,880	\$1,578,139,010	\$38,242,130	2.48%
051	Takoma	\$392,389,350	\$422,397,820	\$30,008,470	7.65%
052	Trinidad	\$1,288,409,710	\$1,419,496,120	\$131,086,410	10.17%
053	Wakefield	\$779,879,190	\$806,056,600	\$26,177,410	3.36%
054	Wesley Heights	\$1,683,782,210	\$1,721,888,860	\$38,106,650	2.26%
055	Woodley	\$303,172,210	\$318,965,670	\$15,793,460	5.21%
056	Woodridge	\$1,174,483,300	\$1,279,866,120	\$105,382,820	8.97%
059	Rail Road Tracks	\$0	\$0	\$0	0.00%
063	North Anacostia Park	\$0	\$0	\$0	0.00%
064	Anacostia Park	\$0	\$0	\$0	0.00%
066	Fort Lincoln	\$535,420,230	\$586,419,690	\$50,999,460	9.53%
068	Bolling AFB & Naval Research	\$10,496,680	\$11,492,390	\$995,710	9.49%
069	D.C. Village	\$0	\$0	\$0	0.00%
073	Washington Navy Yard	\$295,030,940	\$323,270,550	\$28,239,610	9.57%
	Totals:	\$114,773,680,623	\$121,106,947,391	\$6,333,266,768	5.52%

Real Property Assessment Division
2018 Base Change
COMMERCIAL (Class 2)

Neighborhood	Name	Total Base			
		2017	2018	Difference	% Change
001	American University Park	\$652,403,889	\$661,921,790	\$9,517,901	1.46%
002	Anacostia	\$217,712,217	\$218,490,247	\$778,030	0.36%
003	Barry Farms	\$31,993,585	\$32,631,255	\$637,670	1.99%
004	Berkley	\$17,664,560	\$19,132,580	\$1,468,020	8.31%
005	Brentwood	\$800,412,271	\$851,836,126	\$51,423,855	6.42%
006	Brightwood	\$202,965,982	\$220,528,560	\$17,562,578	8.65%
007	Brookland	\$618,902,274	\$648,071,557	\$29,169,283	4.71%
008	Burleith	\$0	\$0	\$0	0.00%
009	Capitol Hill	\$664,703,463	\$716,387,450	\$51,683,987	7.78%
010	Central	\$54,596,556,022	\$56,226,259,484	\$1,629,703,462	2.98%
011	Chevy Chase	\$713,683,317	\$801,002,040	\$87,318,723	12.23%
012	Chillum	\$95,547,933	\$121,177,090	\$25,629,157	26.82%
013	Cleveland Park	\$583,871,076	\$588,044,975	\$4,173,899	0.71%
014	Colonial Village	\$0	\$0	\$0	0.00%
015	Columbia Heights	\$1,077,915,419	\$1,216,605,109	\$138,689,690	12.87%
016	Congress Heights	\$433,565,383	\$435,037,293	\$1,471,910	0.34%
017	Crestwood	\$803,960	\$847,560	\$43,600	5.42%
018	Deanwood	\$259,646,382	\$278,180,452	\$18,534,070	7.14%
019	Eckington	\$579,665,189	\$610,313,851	\$30,648,662	5.29%
020	Foggy Bottom	\$4,153,203,104	\$4,358,825,474	\$205,622,370	4.95%
021	Forest Hills	\$584,424,812	\$601,530,430	\$17,105,618	2.93%
022	Fort Dupont Park	\$33,827,870	\$35,232,590	\$1,404,720	4.15%
023	Foxhall	\$2,926,700	\$3,187,670	\$260,970	8.92%
024	Garfield	\$251,712,599	\$288,309,346	\$36,596,747	14.54%
025	Georgetown	\$3,435,646,752	\$3,653,766,573	\$218,119,821	6.35%
026	Glover Park	\$79,612,020	\$84,379,410	\$4,767,390	5.99%
027	Hawthorne	\$0	\$0	\$0	0.00%
028	Hillcrest	\$93,101,170	\$96,918,376	\$3,817,206	4.10%
029	Kalorama	\$825,404,338	\$879,876,592	\$54,472,254	6.60%
030	Kent	\$97,928,450	\$97,432,250	-\$496,200	-0.51%
031	LeDroit Park	\$24,102,410	\$26,384,530	\$2,282,120	9.47%
032	Lily Ponds	\$117,430,540	\$142,087,800	\$24,657,260	21.00%
033	Marshall Heights	\$12,833,300	\$13,211,460	\$378,160	2.95%
034	Massachusetts Av Heights	\$129,615,566	\$134,414,235	\$4,798,669	3.70%
035	Michigan Park	\$7,589,660	\$8,304,020	\$714,360	9.41%
036	Mount Pleasant	\$520,529,489	\$579,946,390	\$59,416,901	11.41%
037	North Cleveland Park	\$292,365,124	\$260,721,501	-\$31,643,623	-10.82%
038	Observatory Circle	\$471,579,010	\$476,170,469	\$4,591,459	0.97%
039	Old City I	\$5,336,274,153	\$5,509,066,949	\$172,792,796	3.24%
040	Old City II	\$6,595,474,692	\$7,071,204,847	\$475,730,155	7.21%
041	Palisades	\$45,769,700	\$49,651,210	\$3,881,510	8.48%
042	Petworth	\$132,384,339	\$145,203,170	\$12,818,831	9.68%
043	Randle Heights	\$88,296,165	\$91,241,775	\$2,945,610	3.34%
044	NoMa	\$4,547,873,224	\$4,476,447,444	-\$71,425,780	-1.57%
046	SW Waterfront	\$7,049,559,938	\$6,905,773,053	-\$143,786,885	-2.04%
047	Riggs Park	\$73,175,360	\$74,481,605	\$1,306,245	1.79%
048	Shepherd Park	\$32,456,580	\$35,281,420	\$2,824,840	8.70%
049	Sixteenth Street Heights	\$83,578,355	\$91,229,622	\$7,651,267	9.15%
050	Spring Valley	\$95,872,430	\$97,983,900	\$2,111,470	2.20%
051	Takoma	\$169,164,120	\$172,771,600	\$3,607,480	2.13%
052	Trinidad	\$149,614,880	\$172,275,634	\$22,660,754	15.15%
053	Wakefield	\$12,094,100	\$12,861,320	\$767,220	6.34%
054	Wesley Heights	\$95,408,740	\$97,247,390	\$1,838,650	1.93%
055	Woodley	\$11,250	\$11,250	\$0	0.00%
056	Woodridge	\$533,294,426	\$551,856,998	\$18,562,572	3.48%
059	Rail Road Tracks	\$1,585,680	\$1,617,394	\$31,714	2.00%
063	North Anacostia Park	\$1,844,460	\$1,919,290	\$74,830	4.06%
064	Anacostia Park	\$219,000	\$219,000	\$0	0.00%
066	Fort Lincoln	\$86,589,611	\$91,049,650	\$4,460,039	5.15%
068	Bolling AFB & Naval Research	\$17,880,350	\$17,880,350	\$0	0.00%
069	D.C. Village	\$446,210	\$451,910	\$5,700	1.28%
073	Washington Navy Yard	\$774,321,670	\$786,211,510	\$11,889,840	1.54%
	Totals:	\$98,605,035,269	\$101,841,104,826	\$3,236,069,557	3.28%

Real Property Assessment Division
2018 Base Change
RESIDENTIAL/COMMERCIAL (Classes 1 and 2)

Neighborhood	Name	Total Base			
		2017	2018	Difference	% Change
001	American University Park	\$3,006,678,689	\$3,107,280,290	\$100,601,601	3.35%
002	Anacostia	\$769,044,277	\$801,348,652	\$32,304,375	4.20%
003	Barry Farms	\$293,600,805	\$314,030,455	\$20,429,650	6.96%
004	Berkley	\$1,320,744,000	\$1,355,720,150	\$34,976,150	2.65%
005	Brentwood	\$1,270,864,761	\$1,361,708,376	\$90,843,615	7.15%
006	Brightwood	\$2,506,994,434	\$2,670,449,360	\$163,454,926	6.52%
007	Brookland	\$4,100,561,098	\$4,414,050,014	\$313,488,916	7.65%
008	Burleith	\$834,698,510	\$853,512,640	\$18,814,130	2.25%
009	Capitol Hill	\$4,200,498,456	\$4,353,603,390	\$153,104,934	3.64%
010	Central	\$60,291,210,326	\$62,210,983,134	\$1,919,772,808	3.18%
011	Chevy Chase	\$6,040,717,796	\$6,286,663,190	\$245,945,394	4.07%
012	Chillum	\$524,773,663	\$569,785,270	\$45,011,607	8.58%
013	Cleveland Park	\$3,283,646,616	\$3,415,190,325	\$131,543,709	4.01%
014	Colonial Village	\$572,068,830	\$580,723,090	\$8,654,260	1.51%
015	Columbia Heights	\$7,369,013,113	\$7,785,702,519	\$416,689,406	5.65%
016	Congress Heights	\$1,807,765,209	\$1,872,796,843	\$65,031,634	3.60%
017	Crestwood	\$744,666,460	\$784,619,580	\$39,953,120	5.37%
018	Deanwood	\$1,735,747,076	\$1,870,915,032	\$135,167,956	7.79%
019	Eckington	\$2,172,685,329	\$2,256,093,401	\$83,408,072	3.84%
020	Foggy Bottom	\$5,563,414,121	\$5,829,886,744	\$266,472,623	4.79%
021	Forest Hills	\$3,462,499,872	\$3,631,306,150	\$168,806,278	4.88%
022	Fort Dupont Park	\$932,439,770	\$1,027,694,230	\$95,254,460	10.22%
023	Foxhall	\$318,769,100	\$331,190,030	\$12,420,930	3.90%
024	Garfield	\$1,813,619,319	\$1,923,101,706	\$109,482,387	6.04%
025	Georgetown	\$8,935,737,920	\$9,355,185,999	\$419,448,079	4.69%
026	Glover Park	\$1,492,812,140	\$1,566,825,680	\$74,013,540	4.96%
027	Hawthorne	\$287,747,700	\$296,931,560	\$9,183,860	3.19%
028	Hillcrest	\$1,227,498,594	\$1,353,744,965	\$126,246,371	10.28%
029	Kalorama	\$4,332,015,038	\$4,523,859,392	\$191,844,354	4.43%
030	Kent	\$1,398,813,690	\$1,431,910,120	\$33,096,430	2.37%
031	LeDroit Park	\$1,247,236,932	\$1,361,596,370	\$114,359,438	9.17%
032	Lily Ponds	\$505,403,310	\$552,596,430	\$47,193,120	9.34%
033	Marshall Heights	\$405,362,930	\$447,262,830	\$41,899,900	10.34%
034	Massachusetts Av Heights	\$810,230,676	\$827,885,375	\$17,654,699	2.18%
035	Michigan Park	\$401,943,480	\$427,679,340	\$25,735,860	6.40%
036	Mount Pleasant	\$4,144,753,045	\$4,376,649,990	\$231,896,945	5.59%
037	North Cleveland Park	\$1,245,954,912	\$1,261,826,601	\$15,871,689	1.27%
038	Observatory Circle	\$2,029,468,845	\$2,096,352,158	\$66,883,313	3.30%
039	Old City I	\$16,104,004,562	\$16,721,218,139	\$617,213,577	3.83%
040	Old City II	\$20,832,965,075	\$22,396,518,194	\$1,563,553,119	7.51%
041	Palisades	\$1,213,337,955	\$1,271,092,980	\$57,755,025	4.76%
042	Petworth	\$3,135,199,274	\$3,533,931,100	\$398,731,826	12.72%
043	Randle Heights	\$1,211,916,585	\$1,291,473,685	\$79,557,100	6.56%
044	NoMa	\$5,297,720,514	\$5,239,588,214	-\$58,132,300	-1.10%
046	SW Waterfront	\$8,911,562,073	\$8,914,911,171	\$3,349,098	0.04%
047	Riggs Park	\$1,119,629,850	\$1,237,669,845	\$118,039,995	10.54%
048	Shepherd Park	\$727,247,180	\$767,587,700	\$40,340,520	5.55%
049	Sixteenth Street Heights	\$1,482,124,355	\$1,613,049,782	\$130,925,427	8.83%
050	Spring Valley	\$1,635,769,310	\$1,676,122,910	\$40,353,600	2.47%
051	Takoma	\$561,553,470	\$595,169,420	\$33,615,950	5.99%
052	Trinidad	\$1,438,024,590	\$1,591,771,754	\$153,747,164	10.69%
053	Wakefield	\$791,973,290	\$818,917,920	\$26,944,630	3.40%
054	Wesley Heights	\$1,779,190,950	\$1,819,136,250	\$39,945,300	2.25%
055	Woodley	\$303,183,460	\$318,976,920	\$15,793,460	5.21%
056	Woodridge	\$1,707,777,726	\$1,831,723,118	\$123,945,392	7.26%
059	Rail Road Tracks	\$1,585,680	\$1,617,394	\$31,714	2.00%
063	North Anacostia Park	\$1,844,460	\$1,919,290	\$74,830	4.06%
064	Anacostia Park	\$219,000	\$219,000	\$0	0.00%
066	Fort Lincoln	\$622,009,841	\$677,469,340	\$55,459,499	8.92%
068	Bolling AFB & Naval Research	\$28,377,030	\$29,372,740	\$995,710	3.51%
069	D.C. Village	\$446,210	\$451,910	\$5,700	1.28%
073	Washington Navy Yard	\$1,069,352,610	\$1,109,482,060	\$40,129,450	3.75%
	Totals:	\$213,378,715,892	\$222,948,052,217	\$9,569,336,325	4.48%

Real Property Assessment Division
2018 Base Change
EXEMPT

Neighborhood	Name	Total Base			
		2017	2018	Difference	% Change
001	American University Park	\$506,927,563	\$519,166,090	\$12,238,527	2.41%
002	Anacostia	\$70,985,060	\$72,263,790	\$1,278,730	1.80%
003	Barry Farms	\$151,130,393	\$155,586,550	\$4,456,157	2.95%
004	Berkley	\$315,541,750	\$316,981,487	\$1,439,737	0.46%
005	Brentwood	\$233,804,260	\$253,409,545	\$19,605,285	8.39%
006	Brightwood	\$93,807,880	\$97,451,350	\$3,643,470	3.88%
007	Brookland	\$2,456,306,742	\$2,550,206,675	\$93,899,933	3.82%
008	Burleith	\$88,285,390	\$89,861,390	\$1,576,000	1.79%
009	Capitol Hill	\$205,586,430	\$212,345,770	\$6,759,340	3.29%
010	Central	\$4,195,835,941	\$4,367,295,353	\$171,459,412	4.09%
011	Chevy Chase	\$579,210,096	\$589,126,793	\$9,916,697	1.71%
012	Chillum	\$58,203,491	\$59,777,388	\$1,573,897	2.70%
013	Cleveland Park	\$205,880,210	\$207,626,590	\$1,746,380	0.85%
014	Colonial Village	\$57,520,020	\$57,878,650	\$358,630	0.62%
015	Columbia Heights	\$1,406,265,146	\$1,465,819,644	\$59,554,498	4.23%
016	Congress Heights	\$523,593,294	\$556,455,294	\$32,862,000	6.28%
017	Crestwood	\$54,722,620	\$56,465,452	\$1,742,832	3.18%
018	Deanwood	\$372,018,100	\$388,449,280	\$16,431,180	4.42%
019	Eckington	\$111,303,463	\$116,199,974	\$4,896,511	4.40%
020	Foggy Bottom	\$4,148,223,190	\$4,256,814,960	\$108,591,770	2.62%
021	Forest Hills	\$604,230,896	\$625,570,656	\$21,339,760	3.53%
022	Fort Dupont Park	\$133,554,110	\$138,733,530	\$5,179,420	3.88%
023	Foxhall	\$464,020	\$467,870	\$3,850	0.83%
024	Garfield	\$202,995,470	\$228,754,280	\$25,758,810	12.69%
025	Georgetown	\$798,562,060	\$819,414,666	\$20,852,606	2.61%
026	Glover Park	\$29,256,650	\$28,894,680	-\$361,970	-1.24%
027	Hawthorne	\$846,020	\$873,960	\$27,940	3.30%
028	Hillcrest	\$66,122,930	\$68,126,290	\$2,003,360	3.03%
029	Kalorama	\$1,076,566,870	\$1,101,512,665	\$24,945,795	2.32%
030	Kent	\$91,488,530	\$92,358,480	\$869,950	0.95%
031	LeDroit Park	\$601,549,600	\$629,582,070	\$28,032,470	4.66%
032	Lily Ponds	\$164,114,040	\$166,573,500	\$2,459,460	1.50%
033	Marshall Heights	\$95,940,990	\$101,620,110	\$5,679,120	5.92%
034	Massachusetts Av Heights	\$777,678,540	\$784,309,810	\$6,631,270	0.85%
035	Michigan Park	\$56,724,880	\$58,491,040	\$1,766,160	3.11%
036	Mount Pleasant	\$270,442,950	\$274,801,790	\$4,358,840	1.61%
037	North Cleveland Park	\$175,088,280	\$139,095,120	-\$35,993,160	-20.56%
038	Observatory Circle	\$577,390,640	\$586,312,025	\$8,921,385	1.55%
039	Old City I	\$635,395,230	\$659,200,575	\$23,805,345	3.75%
040	Old City II	\$2,035,775,892	\$2,182,931,157	\$147,155,265	7.23%
041	Palisades	\$35,943,280	\$36,642,040	\$698,760	1.94%
042	Petworth	\$104,531,650	\$107,521,560	\$2,989,910	2.86%
043	Randle Heights	\$181,468,180	\$187,343,920	\$5,875,740	3.24%
044	NoMa	\$161,676,740	\$162,569,740	\$893,000	0.55%
046	SW Waterfront	\$225,671,700	\$237,545,300	\$11,873,600	5.26%
047	Riggs Park	\$81,911,280	\$83,297,190	\$1,385,910	1.69%
048	Shepherd Park	\$46,114,340	\$47,615,560	\$1,501,220	3.26%
049	Sixteenth Street Heights	\$151,880,380	\$156,936,347	\$5,055,967	3.33%
050	Spring Valley	\$410,864,590	\$414,843,920	\$3,979,330	0.97%
051	Takoma	\$35,901,780	\$36,393,440	\$491,660	1.37%
052	Trinidad	\$58,699,320	\$61,609,780	\$2,910,460	4.96%
053	Wakefield	\$8,098,120	\$8,370,240	\$272,120	3.36%
054	Wesley Heights	\$82,302,489	\$83,666,964	\$1,364,475	1.66%
055	Woodley	\$106,518,020	\$106,863,887	\$345,867	0.32%
056	Woodridge	\$222,065,520	\$229,775,537	\$7,710,017	3.47%
059	Rail Road Tracks	\$941,710	\$960,544	\$18,834	2.00%
063	North Anacostia Park	\$1,594,160	\$1,594,160	\$0	0.00%
064	Anacostia Park	\$0	\$0	\$0	0.00%
066	Fort Lincoln	\$7,224,360	\$7,605,940	\$381,580	5.28%
068	Bolling AFB & Naval Research	\$0	\$0	\$0	0.00%
069	D.C. Village	\$5,311,210	\$42,483,640	\$37,172,430	699.89%
073	Washington Navy Yard	\$0	\$0	\$0	0.00%
	Totals:	\$26,158,058,466	\$27,090,446,008	\$932,387,542	3.56%

Real Property Assessment Division
2018 Base Change
ALL PROPERTIES

Neighborhood	Name	Total Base			
		2017	2018	Difference	% Change
001	American University Park	\$3,513,606,252	\$3,626,446,380	\$112,840,128	3.21%
002	Anacostia	\$840,029,337	\$873,612,442	\$33,583,105	4.00%
003	Barry Farms	\$444,731,198	\$469,617,005	\$24,885,807	5.60%
004	Berkley	\$1,636,285,750	\$1,672,701,637	\$36,415,887	2.23%
005	Brentwood	\$1,504,669,021	\$1,615,117,921	\$110,448,900	7.34%
006	Brightwood	\$2,600,802,314	\$2,767,900,710	\$167,098,396	6.42%
007	Brookland	\$6,556,867,840	\$6,964,256,689	\$407,388,849	6.21%
008	Burleith	\$922,983,900	\$943,374,030	\$20,390,130	2.21%
009	Capitol Hill	\$4,406,084,886	\$4,565,949,160	\$159,864,274	3.63%
010	Central	\$64,487,046,267	\$66,578,278,487	\$2,091,232,220	3.24%
011	Chevy Chase	\$6,619,927,892	\$6,875,789,983	\$255,862,091	3.87%
012	Chillum	\$582,977,154	\$629,562,658	\$46,585,504	7.99%
013	Cleveland Park	\$3,489,526,826	\$3,622,816,915	\$133,290,089	3.82%
014	Colonial Village	\$629,588,850	\$638,601,740	\$9,012,890	1.43%
015	Columbia Heights	\$8,775,278,259	\$9,251,522,163	\$476,243,904	5.43%
016	Congress Heights	\$2,331,358,503	\$2,429,252,137	\$97,893,634	4.20%
017	Crestwood	\$799,389,080	\$841,085,032	\$41,695,952	5.22%
018	Deanwood	\$2,107,765,176	\$2,259,364,312	\$151,599,136	7.19%
019	Eckington	\$2,283,988,792	\$2,372,293,375	\$88,304,583	3.87%
020	Foggy Bottom	\$9,711,637,311	\$10,086,701,704	\$375,064,393	3.86%
021	Forest Hills	\$4,066,730,768	\$4,256,876,806	\$190,146,038	4.68%
022	Fort Dupont Park	\$1,065,993,880	\$1,166,427,760	\$100,433,880	9.42%
023	Foxhall	\$319,233,120	\$331,657,900	\$12,424,780	3.89%
024	Garfield	\$2,016,614,789	\$2,151,855,986	\$135,241,197	6.71%
025	Georgetown	\$9,734,299,980	\$10,174,600,665	\$440,300,685	4.52%
026	Glover Park	\$1,522,068,790	\$1,595,720,360	\$73,651,570	4.84%
027	Hawthorne	\$288,593,720	\$297,805,520	\$9,211,800	3.19%
028	Hillcrest	\$1,293,621,524	\$1,421,871,255	\$128,249,731	9.91%
029	Kalorama	\$5,408,581,908	\$5,625,372,057	\$216,790,149	4.01%
030	Kent	\$1,490,302,220	\$1,524,268,600	\$33,966,380	2.28%
031	LeDroit Park	\$1,848,786,532	\$1,991,178,440	\$142,391,908	7.70%
032	Lily Ponds	\$669,517,350	\$719,169,930	\$49,652,580	7.42%
033	Marshall Heights	\$501,303,920	\$548,882,940	\$47,579,020	9.49%
034	Massachusetts Av Heights	\$1,587,909,216	\$1,612,195,185	\$24,285,969	1.53%
035	Michigan Park	\$458,668,360	\$486,170,380	\$27,502,020	6.00%
036	Mount Pleasant	\$4,415,195,995	\$4,651,451,780	\$236,255,785	5.35%
037	North Cleveland Park	\$1,421,043,192	\$1,400,921,721	-\$20,121,471	-1.42%
038	Observatory Circle	\$2,606,859,485	\$2,682,664,183	\$75,804,698	2.91%
039	Old City I	\$16,739,399,792	\$17,380,418,714	\$641,018,922	3.83%
040	Old City II	\$22,868,740,967	\$24,579,449,351	\$1,710,708,384	7.48%
041	Palisades	\$1,249,281,235	\$1,307,735,020	\$58,453,785	4.68%
042	Petworth	\$3,239,730,924	\$3,641,452,660	\$401,721,736	12.40%
043	Randle Heights	\$1,393,384,765	\$1,478,817,605	\$85,432,840	6.13%
044	NoMa	\$5,459,397,254	\$5,402,157,954	-\$57,239,300	-1.05%
046	SW Waterfront	\$9,137,233,773	\$9,152,456,471	\$15,222,698	0.17%
047	Riggs Park	\$1,201,541,130	\$1,320,967,035	\$119,425,905	9.94%
048	Shepherd Park	\$773,361,520	\$815,203,260	\$41,841,740	5.41%
049	Sixteenth Street Heights	\$1,634,004,735	\$1,769,986,129	\$135,981,394	8.32%
050	Spring Valley	\$2,046,633,900	\$2,090,966,830	\$44,332,930	2.17%
051	Takoma	\$597,455,250	\$631,562,860	\$34,107,610	5.71%
052	Trinidad	\$1,496,723,910	\$1,653,381,534	\$156,657,624	10.47%
053	Wakefield	\$800,071,410	\$827,288,160	\$27,216,750	3.40%
054	Wesley Heights	\$1,861,493,439	\$1,902,803,214	\$41,309,775	2.22%
055	Woodley	\$409,701,480	\$425,840,807	\$16,139,327	3.94%
056	Woodridge	\$1,929,843,246	\$2,061,498,655	\$131,655,409	6.82%
059	Rail Road Tracks	\$2,527,390	\$2,577,938	\$50,548	2.00%
063	North Anacostia Park	\$3,438,620	\$3,513,450	\$74,830	2.18%
064	Anacostia Park	\$219,000	\$219,000	\$0	0.00%
066	Fort Lincoln	\$629,234,201	\$685,075,280	\$55,841,079	8.87%
068	Bolling AFB & Naval Research	\$28,377,030	\$29,372,740	\$995,710	3.51%
069	D.C. Village	\$5,757,420	\$42,935,550	\$37,178,130	645.74%
073	Washington Navy Yard	\$1,069,352,610	\$1,109,482,060	\$40,129,450	3.75%
	Totals:	\$239,536,774,358	\$250,038,498,225	\$10,501,723,867	4.38%

Parcel Count per Neighborhood - 2018

NBHD	NAME		Commercial	Exempt	Total
	AMERICAN UNIV. PARK	2,693	92	35	2,820
002	ANACOSTIA	2,076	180	79	2,335
003	BARRY FARMS	891	44	96	1,031
004	BERKLEY	814	7	42	863
005	BRENTWOOD	967	379	119	1,465
006	BRIGHTWOOD	4,367	142	88	4,597
007	BROOKLAND	7,820	279	366	8,465
008	BURLEITH	855		5	860
009	CAPITOL HILL	4,125	337	65	4,527
010	CENTRAL	6,929	1,268	186	8,383
011	CHEVY CHASE	5,777	147	63	5,987
012	CHILLUM	1,033	63	65	1,161
013	CLEVELAND PARK	3,363	42	41	3,446
014	COLONIAL VILLAGE	648		19	667
015	COLUMBIA HEIGHTS	10,810	532	348	11,690
016	CONGRESS HEIGHTS	5,438	166	239	5,843
017	CRESTWOOD	820	1	25	846
018	DEANWOOD	6,928	317	499	7,744
	ECKINGTON	2,422	145	42	2,609
020	FOGGY BOTTOM	2,180	145	118	2,443
021	FOREST HILLS	3,335	54	54	3,443
022	FORT DUPONT PARK	3,616	53	110	3,779
023	FOXHALL	370	1	1	372
024	GARFIELD	1,373	53	227	1,653
025	GEORGETOWN	4,644	617	176	5,437
026	GLOVER PARK	2,609	58	30	2,697
027	HAWTHORNE	313		1	314
028	HILLCREST	4,499	102	85	4,686
029	KALORAMA	3,758	132	210	4,100
030	KENT	909	30	23	962
031	LEDROIT PARK	1,908	33	43	1,984
032	LILY PONDS	1,598	54	91	1,743
033	MARSHALL HEIGHTS	1,944	18	157	2,119
034	MASS. AVE. HEIGHTS	193	2	54	249
035	MICHIGAN PARK	940	12	10	962
036	MOUNT PLEASANT	4,723	224	114	5,061
037	N. CLEVELAND PARK	881	42	9	932
038	OBSERVATORY CIRCLE	1,778	40	76	1,894
039	OLD CITY I	16,748	957	177	17,882
040	OLD CITY II	20,730	1,162	362	22,254
041	PALISADES	1,415	54	23	1,492
042	PETWORTH	6,603	259	59	6,921
043	RANDLE HEIGHTS	3,958	65	207	4,230
044	NOMA	495	180	21	696
046	SW WATERFRONT	3,819	222	34	4,075
047	RIGGS PARK	2,860	37	34	2,931
048	SHEPHERD PARK	1,002	34	14	1,050
049	16TH ST. HEIGHTS	2,340	118	76	2,534
050	SPRING VALLEY	937	8	36	981
051	TAKOMA	907	56	83	1,046
052	TRINIDAD	3,236	110	47	3,393
053	WAKEFIELD	972	15	3	990
054	WESLEY HEIGHTS	3,031	4	22	3,057
055	WOODLEY	209	1	3	213
056	WOODRIDGE	3,058	392	80	3,530
059	RAIL ROAD TRACKS		3	4	7
060	N. ROCK CREEK PARK				
061	NATL. ZOO				
062	S. ROCK CREEK PARK				
063	N. ANACOSTIA PARK		4	10	14
064	S. ANACOSTIA PARK		1		1
065	NATIONAL ARBORETUM				
066	FORT LINCOLN	1,400	6	19	1,425
067	ST. ELIZABETHS HOSPITAL				
068	BOLLING AFB & NAVAL RES	9	20		29
069	D.C. VILLAGE		1	1	2
070	FORT DRIVE				
071	GLOVER-ARCHBOLD PWY				
072	MALL				
073	WASHINGTON NAVY YARD	18	16		34
	TOTALS:	184,094	9,536	5,326	198,956

*DC and US (5,217) not included in Base Report Statistics

**PI accounts (308) not included in Base Report Statistics

Preliminary 2018 Performance Report

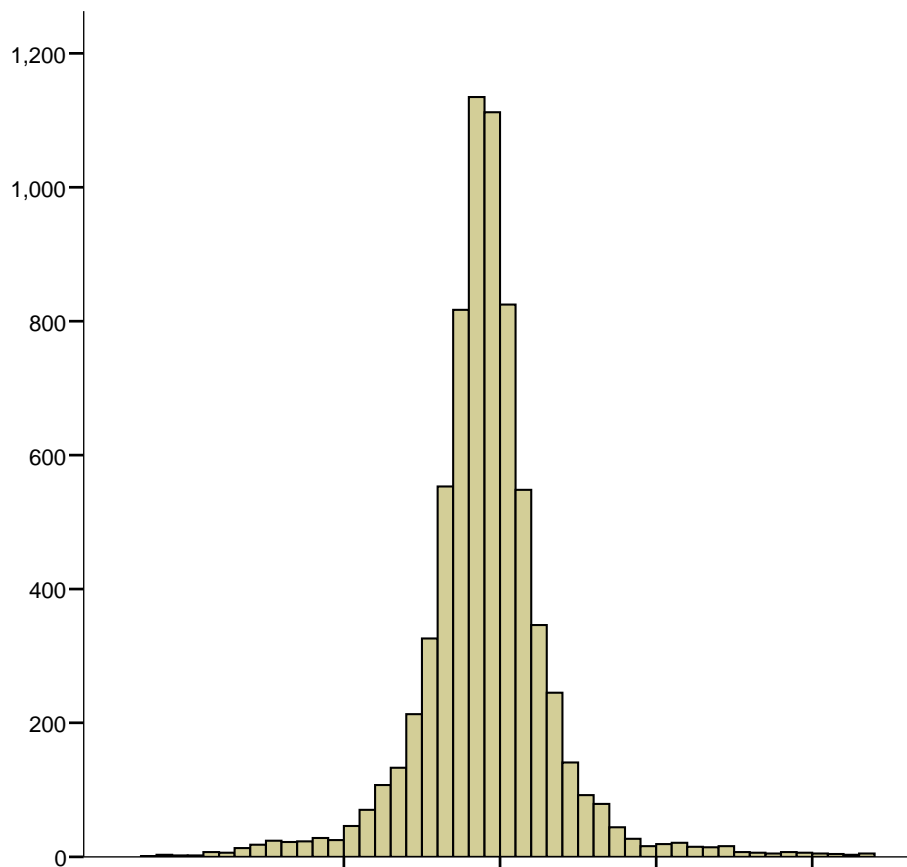
2016 SALES RATIOS CITY-WIDE

PROPERTY TYPE	SALES	AVE PRICE	MED PRICE	MEDIAN	MEAN	WEIGHTED	COD	< 105	> 105	PRD
All	7,418	960,313	575,000	97.4	97.5	94.5	7.4	6,265	1,153	1.03

2016 SALES RATIOS BY PROPERTY TYPE: CITY-WIDE

PROPERTY TYPE	SALES	AVE PRICE	MED PRICE	MEDIAN	MEAN	WEIGHTED	COD	< 105	> 105	PRD
Residential	7,182	672,327	565,000	97.5	97.7	97.1	7.1	6,061	1,121	1.01
Commercial	236	9,724,367	1,525,000	93.3	91.9	89.1	13.2	204	32	1.03

CITY-WIDE RESIDENTIAL SALES RATIOS



Sales Ratio Report Using Current 2017 Values

2016 SALES RATIOS BY NEIGHBORHOOD: SINGLE-FAMILY

NB NAME	SALES	AVE PRICE	MED PRICE	MEDIAN	MEAN	WEIGHTED	COD	< 105	> 105	PRD
1 AMERICAN UNIVERSITY	68	1,068,404	1,005,500	86.4	87.5	87.4	10.2	66	2	1.00
2 ANACOSTIA	66	357,201	372,500	93.1	92.3	91.2	12.7	59	7	1.01
3 BARRY FARMS	16	342,628	355,500	93.3	88.7	90.0	13.0	15	1	.99
4 BERKELEY	28	1,832,847	1,575,363	93.8	95.1	94.4	12.6	21	7	1.01
5 BRENTWOOD	27	427,823	425,000	88.4	90.1	88.5	9.9	25	2	1.02
6 BRIGHTWOOD	131	584,480	560,000	90.5	90.7	89.9	11.1	117	14	1.01
7 BROOKLAND	221	633,491	620,000	91.1	89.8	89.4	10.7	207	14	1.01
8 BURLEITH	43	1,096,344	941,000	94.6	93.4	93.6	8.1	41	2	1.00
9 CAPITOL HILL	107	1,123,845	1,004,495	92.5	91.3	89.5	9.3	95	12	1.02
10 CENTRAL	9	1,444,129	1,600,000	95.3	91.6	87.9	10.9	8	1	1.04
11 CHEVY CHASE	179	1,088,912	982,000	93.5	94.1	93.9	8.8	158	21	1.00
12 CHILLUM	28	561,802	539,500	85.4	87.4	87.2	10.2	28	0	1.00
13 CLEVELAND PARK	42	1,809,683	1,497,500	95.9	93.6	89.3	14.6	32	10	1.05
14 COLONIAL VILLAGE	12	1,010,250	853,500	96.2	97.3	97.3	9.2	10	2	1.00
15 COLUMBIA HEIGHTS	185	740,437	710,000	90.5	89.8	88.4	10.5	169	16	1.02
16 CONGRESS HEIGHTS	80	298,206	300,000	96.7	94.8	92.8	13.3	64	16	1.02
17 CRESTWOOD	17	998,088	927,000	87.4	90.6	90.2	7.9	15	2	1.00
18 DEANWOOD	180	296,986	289,500	87.7	87.0	85.8	15.4	159	21	1.01
19 ECKINGTON	70	768,172	741,250	91.0	90.3	90.2	8.7	65	5	1.00
20 FOGGY BOTTOM	3	742,333	755,000	116.5	108	109.1	10.6	1	2	.99
21 FOREST HILLS	26	1,803,146	1,497,500	85.6	86.0	86.1	11.5	23	3	1.00
22 FORT DUPONT PARK	81	318,393	320,000	86.0	85.6	85.4	13.1	73	8	1.00
23 FOXHALL	19	973,466	922,000	89.9	86.9	85.5	9.5	17	2	1.02
24 GARFIELD	21	1,387,690	1,400,000	92.0	90.8	90.0	8.8	20	1	1.01
25 GEORGETOWN	136	1,616,099	1,372,700	91.2	91.2	91.5	10.6	121	15	1.00
26 GLOVER PARK	41	907,634	899,900	88.7	89.9	89.1	7.0	41	0	1.01
27 HAWTHORNE	8	995,609	982,500	92.1	92.6	93.3	4.8	8	0	.99
28 HILLCREST	64	412,016	415,000	82.4	84.3	83.8	14.7	59	5	1.01
29 KALORAMA	27	2,479,574	2,400,000	87.7	90.5	90.8	12.0	24	3	1.00
30 KENT	43	1,651,605	1,250,000	97.1	95.5	95.1	9.2	32	11	1.00
31 LEDROIT PARK	53	977,211	910,000	88.3	87.7	86.0	10.4	49	4	1.02
32 LILY PONDS	107	353,823	369,000	94.1	92.4	92.2	11.0	98	9	1.00
33 MARSHALL HEIGHTS	51	296,791	299,500	84.7	83.8	81.6	20.7	44	7	1.03
34 MASS. AVE. HEIGHTS	4	3,672,500	3,557,500	97.7	101	107.7	13.8	3	1	.94
35 MICHIGAN PARK	39	555,703	559,000	91.2	89.5	88.4	10.9	36	3	1.01
36 MOUNT PLEASANT	72	1,065,282	1,025,000	86.8	88.6	87.6	10.4	63	9	1.01
37 N. CLEVELAND PARK	30	1,164,693	1,082,500	87.6	87.3	86.9	11.1	29	1	1.01
38 OBSERVATORY CIRCLE	25	1,835,720	1,345,000	86.4	88.9	89.0	12.6	21	4	1.00
39 OLD CITY #1	565	761,006	735,000	93.6	92.5	91.3	8.9	512	53	1.01
40 OLD CITY #2	172	1,090,740	927,000	92.0	90.8	90.1	9.9	159	13	1.01
41 PALISADES	37	1,226,794	1,105,000	90.5	90.5	89.3	9.9	35	2	1.01
42 PETWORTH	254	607,820	599,900	84.5	82.6	81.0	14.5	239	15	1.02
43 RANDLE HEIGHTS	99	369,877	350,000	94.2	93.5	92.7	10.4	86	13	1.01
46 SW WATERFRONT	8	1,006,500	950,000	92.8	90.2	89.4	4.9	8	0	1.01
47 RIGGS PARK	85	444,518	430,000	85.3	84.2	83.2	12.2	82	3	1.01
48 SHEPHERD PARK	31	869,003	826,500	89.5	91.2	90.7	10.2	27	4	1.01
49 16TH STREET HEIGHTS	72	858,918	799,900	86.8	87.1	87.3	11.1	67	5	1.00
50 SPRING VALLEY	30	1,714,800	1,567,500	95.8	94.0	92.4	8.0	26	4	1.02
51 TAKOMA PARK	32	498,424	500,000	90.5	90.9	90.1	10.6	30	2	1.01
52 TRINIDAD	132	510,474	507,500	87.0	84.4	82.0	13.9	125	7	1.03
53 WAKEFIELD	13	1,135,607	1,050,000	94.9	96.5	96.9	9.4	10	3	1.00
54 WESLEY HEIGHTS	26	1,812,135	1,685,250	88.8	89.9	89.5	9.3	24	2	1.01
55 WOODLEY	7	1,690,429	1,527,500	92.2	91.2	90.4	6.1	7	0	1.01
56 WOODRIDGE	89	557,451	550,000	87.2	87.8	87.0	10.2	84	5	1.01
66 FORT LINCOLN	39	623,580	575,000	92.5	91.7	90.7	4.8	39	0	1.01

TOTALS:

PROPERTY TYPE	SALES	AVE PRICE	MED PRICE	MEDIAN	MEAN	WEIGHTED	COD	< 105	> 105	PRD
Single-Family	4,050	806,637	699,000	90.7	89.8	89.6	11.3	3,676	374	1.00

Sales Ratio Report Using Proposed 2018 Values

2016 SALES RATIOS BY NEIGHBORHOOD: SINGLE-FAMILY

NB NAME	SALES	AVE PRICE	MED PRICE	MEDIAN	MEAN	WEIGHTED	COD	< 105	> 105	PRD
1 AMERICAN UNIVERSITY	68	1,068,404	1,005,500	97.3	95.8	95.6	5.8	62	6	1.00
2 ANACOSTIA	66	357,201	372,500	99.0	98.9	97.4	8.6	54	12	1.01
3 BARRY FARMS	16	342,628	355,500	99.7	96.6	97.1	6.2	15	1	.99
4 BERKELEY	28	1,832,847	1,575,363	99.5	102	100.7	8.1	21	7	1.01
5 BRENTWOOD	27	427,823	425,000	97.9	98.9	97.2	8.2	21	6	1.02
6 BRIGHTWOOD	131	584,480	560,000	98.6	99.2	98.4	8.4	100	31	1.01
7 BROOKLAND	221	633,491	620,000	98.0	97.7	96.8	7.6	183	38	1.01
8 BURLEITH	43	1,096,344	941,000	98.3	97.8	97.1	4.9	38	5	1.01
9 CAPITOL HILL	107	1,123,845	1,004,495	97.6	96.6	95.7	7.1	90	17	1.01
10 CENTRAL	9	1,444,129	1,600,000	97.3	99.4	97.8	4.8	8	1	1.02
11 CHEVY CHASE	179	1,088,912	982,000	98.8	98.9	98.7	4.8	155	24	1.00
12 CHILLUM	28	561,802	539,500	96.6	96.3	96.0	5.7	25	3	1.00
13 CLEVELAND PARK	42	1,809,683	1,497,500	99.9	99.9	98.4	7.3	32	10	1.02
14 COLONIAL VILLAGE	12	1,010,250	853,500	99.7	98.9	99.1	3.3	11	1	1.00
15 COLUMBIA HEIGHTS	185	740,437	710,000	98.0	97.4	96.1	8.2	151	34	1.01
16 CONGRESS HEIGHTS	80	298,206	300,000	99.7	98.7	96.6	11.5	61	19	1.02
17 CRESTWOOD	17	998,088	927,000	97.6	99.4	99.0	5.8	13	4	1.00
18 DEANWOOD	180	296,986	289,500	98.3	99.4	98.1	10.1	132	48	1.01
19 ECKINGTON	70	768,172	741,250	98.0	97.4	97.1	6.2	62	8	1.00
20 FOGGY BOTTOM	3	742,333	755,000	99.1	98.4	98.6	3.4	3	0	1.00
21 FOREST HILLS	26	1,803,146	1,497,500	98.9	99.6	99.2	7.8	19	7	1.00
22 FORT DUPONT PARK	81	318,393	320,000	98.2	100	99.3	7.0	67	14	1.01
23 FOXHALL	19	973,466	922,000	98.4	96.6	95.9	6.3	16	3	1.01
24 GARFIELD	21	1,387,690	1,400,000	98.4	98.8	98.6	2.8	20	1	1.00
25 GEORGETOWN	136	1,616,099	1,372,700	98.8	97.7	97.7	3.7	128	8	1.00
26 GLOVER PARK	41	907,634	899,900	98.0	97.6	97.2	3.0	40	1	1.00
27 HAWTHORNE	8	995,609	982,500	98.3	97.7	98.1	2.6	8	0	1.00
28 HILLCREST	64	412,016	415,000	94.7	96.7	96.5	10.5	51	13	1.00
29 KALORAMA	27	2,479,574	2,400,000	99.0	98.0	98.3	3.1	26	1	1.00
30 KENT	43	1,651,605	1,250,000	99.0	100	99.1	6.5	30	13	1.01
31 LEDROIT PARK	53	977,211	910,000	98.6	98.7	97.3	7.2	44	9	1.01
32 LILY PONDS	107	353,823	369,000	98.1	98.8	98.1	7.4	93	14	1.01
33 MARSHALL HEIGHTS	51	296,791	299,500	96.3	98.5	96.1	13.9	36	15	1.03
34 MASS. AVE. HEIGHTS	4	3,672,500	3,557,500	98.8	97.8	98.3	1.9	4	0	.99
35 MICHIGAN PARK	39	555,703	559,000	97.3	98.5	97.7	6.8	35	4	1.01
36 MOUNT PLEASANT	72	1,065,282	1,025,000	99.5	99.7	98.9	8.4	50	22	1.01
37 N. CLEVELAND PARK	30	1,164,693	1,082,500	96.8	97.2	96.7	5.7	28	2	1.00
38 OBSERVATORY CIRCLE	25	1,835,720	1,345,000	97.0	95.2	94.1	6.2	24	1	1.01
39 OLD CITY #1	565	761,006	735,000	98.3	98.2	97.3	6.7	477	88	1.01
40 OLD CITY #2	172	1,090,740	927,000	98.7	97.9	97.2	7.5	141	31	1.01
41 PALISADES	37	1,226,794	1,105,000	98.5	97.5	97.1	6.9	30	7	1.00
42 PETWORTH	254	607,820	599,900	96.0	94.2	92.3	13.2	193	61	1.02
43 RANDLE HEIGHTS	99	369,877	350,000	97.8	98.5	97.0	7.8	84	15	1.02
46 SW WATERFRONT	8	1,006,500	950,000	99.9	98.6	98.1	3.4	8	0	1.00
47 RIGGS PARK	85	444,518	430,000	96.5	94.8	93.7	9.8	69	16	1.01
48 SHEPHERD PARK	31	869,003	826,500	97.8	99.4	98.7	5.7	26	5	1.01
49 16TH STREET HEIGHTS	72	858,918	799,900	96.8	96.8	96.2	8.1	57	15	1.01
50 SPRING VALLEY	30	1,714,800	1,567,500	99.5	99.9	99.2	5.4	24	6	1.01
51 TAKOMA PARK	32	498,424	500,000	98.2	100	99.6	8.6	23	9	1.01
52 TRINIDAD	132	510,474	507,500	95.0	92.9	90.2	13.7	101	31	1.03
53 WAKEFIELD	13	1,135,607	1,050,000	99.3	99.0	99.3	2.6	12	1	1.00
54 WESLEY HEIGHTS	26	1,812,135	1,685,250	98.4	96.7	96.0	6.2	23	3	1.01
55 WOODLEY	7	1,690,429	1,527,500	98.3	101	100.9	4.8	6	1	1.00
56 WOODRIDGE	89	557,451	550,000	96.8	97.2	96.7	9.0	69	20	1.01
66 FORT LINCOLN	39	623,580	575,000	97.0	95.7	94.5	5.4	37	2	1.01

TOTALS:

PROPERTY TYPE	SALES	AVE PRICE	MED PRICE	MEDIAN	MEAN	WEIGHTED	COD	< 105	> 105	PRD
Single-Family	4,050	806,637	699,000	98.1	97.7	97.0	7.9	3,336	714	1.01

Sales Ratio Report Using Current 2017 Values

2016 SALES RATIOS BY NEIGHBORHOOD: CONDOMINIUMS

NB NAME	SALES	AVE PRICE	MED PRICE	MEDIAN	MEAN	WEIGHTED	COD	< 105	> 105	PRD
1 AMERICAN UNIVERSITY	12	586,333	502,500	94.1	93.0	91.4	4.8	12	0	1.02
2 ANACOSTIA	9	217,290	164,013	92.1	98.0	94.3	21.1	6	3	1.04
3 BARRY FARMS	9	330,011	299,900	114.0	109	108.4	4.6	2	7	1.01
4 BERKELEY	2	490,000	490,000	93.2	93.2	93.8	2.7	2	0	.99
5 BRENTWOOD	10	269,800	276,000	76.1	73.9	73.3	23.1	10	0	1.01
6 BRIGHTWOOD	23	297,488	277,000	94.7	95.1	93.9	11.0	17	6	1.01
7 BROOKLAND	70	371,556	344,950	94.9	90.4	92.0	7.9	67	3	.98
9 CAPITOL HILL	37	362,730	299,500	97.5	97.0	94.8	8.6	26	11	1.02
10 CENTRAL	314	647,195	501,825	96.7	97.2	96.2	8.4	257	57	1.01
11 CHEVY CHASE	32	596,952	587,500	98.8	97.7	98.3	5.2	29	3	.99
13 CLEVELAND PARK	91	406,198	375,000	93.6	94.7	94.0	6.4	85	6	1.01
15 COLUMBIA HEIGHTS	377	503,201	494,000	95.9	96.1	96.5	6.6	328	49	1.00
16 CONGRESS HEIGHTS	14	143,205	127,685	94.1	101	85.2	30.1	9	5	1.19
18 DEANWOOD	2	152,500	152,500	88.5	88.5	82.6	14.0	2	0	1.07
19 ECKINGTON	79	526,737	534,600	92.6	92.5	93.2	6.8	73	6	.99
20 FOGGY BOTTOM	50	337,814	280,500	97.4	96.9	96.4	8.1	37	13	1.01
21 FOREST HILLS	43	303,624	269,000	98.2	96.1	96.8	6.8	37	6	.99
22 FORT DUPONT PARK	6	92,023	88,470	99.3	94.2	86.2	22.3	4	2	1.09
24 GARFIELD	30	391,463	402,750	93.0	94.9	92.8	7.7	26	4	1.02
25 GEORGETOWN	65	781,665	632,000	91.5	94.4	94.5	11.3	54	11	1.00
26 GLOVER PARK	43	303,590	298,000	98.9	99.8	99.4	8.2	33	10	1.00
28 HILLCREST	15	84,960	95,000	91.6	99.3	93.9	16.4	12	3	1.06
29 KALORAMA	122	583,207	472,500	96.3	95.1	92.7	8.4	106	16	1.03
31 LEDROIT PARK	61	514,100	499,900	94.9	94.6	94.3	6.3	55	6	1.00
32 LILY PONDS	2	275,750	275,750	88.3	88.3	85.8	11.7	2	0	1.03
33 MARSHALL HEIGHTS	1	55,000	55,000	154.1	154	154.1	.0	0	1	1.00
36 MOUNT PLEASANT	179	474,874	435,000	95.0	94.6	94.4	6.5	161	18	1.00
37 N. CLEVELAND PARK	1	399,000	399,000	97.5	97.5	97.5	.0	1	0	1.00
38 OBSERVATORY CIRCLE	55	446,007	359,000	97.5	98.0	96.0	8.2	44	11	1.02
39 OLD CITY #1	309	485,334	439,000	95.7	94.4	94.1	5.7	286	23	1.00
40 OLD CITY #2	689	548,613	509,000	95.8	95.1	94.0	8.0	599	90	1.01
41 PALISADES	13	282,673	249,000	97.9	95.0	93.9	7.1	12	1	1.01
42 PETWORTH	74	420,900	364,950	93.7	93.1	93.0	4.3	72	2	1.00
43 RANDLE HEIGHTS	7	86,429	65,000	116.6	114	107.8	15.4	2	5	1.06
46 SW WATERFRONT	154	474,951	406,000	94.5	92.4	92.3	6.4	148	6	1.00
49 16TH STREET HEIGHTS	16	341,859	312,500	95.0	93.8	94.9	5.8	16	0	.99
52 TRINIDAD	56	373,215	349,450	95.0	94.2	94.3	1.7	56	0	1.00
53 WAKEFIELD	13	376,000	425,000	92.6	92.9	92.2	5.4	13	0	1.01
54 WESLEY HEIGHTS	36	441,793	444,500	92.4	92.6	92.0	8.6	33	3	1.01
56 WOODRIDGE	6	250,949	305,000	95.0	93.9	87.8	15.9	4	2	1.07
66 FORT LINCOLN	5	262,800	240,000	90.9	89.7	88.1	4.7	5	0	1.02

TOTALS:

PROPERTY TYPE	SALES	AVE PRICE	MED PRICE	MEDIAN	MEAN	WEIGHTED	COD	< 105	> 105	PRD
Condominium	3,132	498,649	445,950	95.0	95.1	94.6	7.7	2,743	389	1.01

Sales Ratio Report Using Proposed 2018 Values

2016 SALES RATIOS BY NEIGHBORHOOD: CONDOMINIUMS

NB NAME	SALES	AVE PRICE	MED PRICE	MEDIAN	MEAN	WEIGHTED	COD	< 105	> 105	PRD
1 AMERICAN UNIVERSITY	12	586,333	502,500	97.6	96.4	94.7	4.8	12	0	1.02
2 ANACOSTIA	9	217,290	164,013	99.8	101	95.4	19.7	6	3	1.06
3 BARRY FARMS	9	330,011	299,900	98.1	97.5	97.3	1.3	9	0	1.00
4 BERKELEY	2	490,000	490,000	95.6	95.6	96.1	2.1	2	0	.99
5 BRENTWOOD	10	269,800	276,000	96.1	92.4	91.8	7.8	10	0	1.01
6 BRIGHTWOOD	23	297,488	277,000	98.2	99.3	97.8	8.2	18	5	1.02
7 BROOKLAND	70	371,556	344,950	95.8	96.0	96.1	6.2	64	6	1.00
9 CAPITOL HILL	37	362,730	299,500	99.6	99.4	98.6	5.7	30	7	1.01
10 CENTRAL	314	647,195	501,825	97.6	98.5	97.8	7.4	250	64	1.01
11 CHEVY CHASE	32	596,952	587,500	100.7	99.3	98.9	4.5	29	3	1.00
13 CLEVELAND PARK	91	406,198	375,000	97.4	98.3	97.7	4.7	83	8	1.01
15 COLUMBIA HEIGHTS	377	503,201	494,000	97.3	98.1	98.3	5.6	330	47	1.00
16 CONGRESS HEIGHTS	14	143,205	127,685	96.4	106	92.2	24.9	9	5	1.15
18 DEANWOOD	2	152,500	152,500	96.3	96.3	93.8	5.5	2	0	1.03
19 ECKINGTON	79	526,737	534,600	95.8	97.2	97.2	4.7	72	7	1.00
20 FOGGY BOTTOM	50	337,814	280,500	97.6	98.0	98.3	7.3	40	10	1.00
21 FOREST HILLS	43	303,624	269,000	97.9	96.4	97.2	6.8	36	7	.99
22 FORT DUPONT PARK	6	92,023	88,470	100.0	97.9	89.0	19.0	4	2	1.10
24 GARFIELD	30	391,463	402,750	97.2	97.6	96.7	5.8	25	5	1.01
25 GEORGETOWN	65	781,665	632,000	96.8	97.5	98.4	7.1	56	9	.99
26 GLOVER PARK	43	303,590	298,000	98.3	99.9	99.4	7.4	33	10	1.01
28 HILLCREST	15	84,960	95,000	96.9	102	97.5	14.4	12	3	1.05
29 KALORAMA	122	583,207	472,500	97.8	97.7	95.8	4.8	109	13	1.02
31 LEDROIT PARK	61	514,100	499,900	95.8	96.7	96.5	5.4	54	7	1.00
32 LILY PONDS	2	275,750	275,750	99.0	99.0	97.1	7.8	1	1	1.02
33 MARSHALL HEIGHTS	1	55,000	55,000	154.5	155	154.5	.0	0	1	1.00
36 MOUNT PLEASANT	179	474,874	435,000	98.0	97.8	97.8	4.8	162	17	1.00
37 N. CLEVELAND PARK	1	399,000	399,000	104.7	105	104.7	.0	1	0	1.00
38 OBSERVATORY CIRCLE	55	446,007	359,000	98.3	99.2	99.2	4.9	49	6	1.00
39 OLD CITY #1	309	485,334	439,000	96.0	96.7	96.4	5.0	274	35	1.00
40 OLD CITY #2	689	548,613	509,000	97.0	97.7	97.2	6.1	598	91	1.01
41 PALISADES	13	282,673	249,000	101.8	98.6	97.6	6.0	10	3	1.01
42 PETWORTH	74	420,900	364,950	95.0	95.8	95.8	4.2	70	4	1.00
43 RANDLE HEIGHTS	7	86,429	65,000	117.6	117	109.9	17.0	2	5	1.06
46 SW WATERFRONT	154	474,951	406,000	95.0	95.8	94.8	5.5	140	14	1.01
49 16TH STREET HEIGHTS	16	341,859	312,500	96.7	97.9	97.9	5.8	13	3	1.00
52 TRINIDAD	56	373,215	349,450	95.0	95.7	95.6	2.0	56	0	1.00
53 WAKEFIELD	13	376,000	425,000	96.2	96.0	95.2	5.7	12	1	1.01
54 WESLEY HEIGHTS	36	441,793	444,500	96.3	94.3	95.1	6.3	33	3	.99
56 WOODRIDGE	6	250,949	305,000	95.0	93.9	89.6	11.9	4	2	1.05
66 FORT LINCOLN	5	262,800	240,000	95.9	96.0	95.4	2.5	5	0	1.01

TOTALS:

PROPERTY TYPE	SALES	AVE PRICE	MED PRICE	MEDIAN	MEAN	WEIGHTED	COD	< 105	> 105	PRD
Condominium	3,132	498,649	445,950	97.0	97.6	97.2	6.1	2,725	407	1.00

Sales Ratio Report Using Current 2017 Values

2016 SALES RATIOS BY NEIGHBORHOOD: MULTI-FAMILY

NB NAME	SALES	AVE PRICE	MED PRICE	MEDIAN	MEAN	WEIGHTED	COD	< 105	> 105	PRD
2 ANACOSTIA	1	1,110,000	1,110,000	86.9	86.9	86.9	.0	1	0	1.00
3 BARRY FARMS	1	620,000	620,000	66.5	66.5	66.5	.0	1	0	1.00
6 BRIGHTWOOD	3	3,520,000	4,400,000	111.2	101	98.6	9.3	1	2	1.03
9 CAPITOL HILL	3	2,398,333	2,500,000	78.1	75.4	72.9	18.2	3	0	1.03
12 CHILLUM	2	969,665	969,665	125.8	126	126.1	4.3	0	2	1.00
15 COLUMBIA HEIGHTS	6	2,430,833	2,155,000	85.6	81.4	85.2	19.5	5	1	.96
16 CONGRESS HEIGHTS	7	3,601,357	695,000	96.7	87.9	62.4	14.9	6	1	1.41
18 DEANWOOD	3	408,787	401,480	109.3	93.5	89.6	14.4	1	2	1.04
22 FORT DUPONT PARK	4	3,339,375	2,228,750	81.2	81.9	78.4	11.0	4	0	1.04
25 GEORGETOWN	1	3,300,000	3,300,000	62.2	62.2	62.2	.0	1	0	1.00
28 HILLCREST	3	1,013,333	975,000	88.3	89.6	90.5	2.1	3	0	.99
29 KALORAMA	2	7,594,500	7,594,500	82.6	82.6	66.3	28.8	1	1	1.25
33 MARSHALL HEIGHTS	3	1,021,500	785,000	78.8	83.6	82.7	9.9	3	0	1.01
36 MOUNT PLEASANT	1	3,800,000	3,800,000	101.1	101	101.1	.0	1	0	1.00
39 OLD CITY #1	5	43,802,000	7,500,000	64.9	65.5	59.8	20.4	5	0	1.10
40 OLD CITY #2	3	19,400,000	2,600,000	84.4	77.6	83.8	8.4	3	0	.93
41 PALISADES	1	900,000	900,000	133.6	134	133.6	.0	0	1	1.00
42 PETWORTH	3	3,247,578	2,700,000	93.6	95.7	101.3	17.8	2	1	.95
43 RANDLE HEIGHTS	1	520,000	520,000	120.9	121	120.9	.0	0	1	1.00
48 SHEPHERD PARK	2	1,970,000	1,970,000	82.3	82.3	80.8	11.0	2	0	1.02
49 16TH STREET HEIGHTS	3	1,241,667	1,100,000	91.1	94.5	93.6	3.9	3	0	1.01
52 TRINIDAD	1	77,875,000	77875000	75.4	75.4	75.4	.0	1	0	1.00
TOTALS:										
PROPERTY TYPE	SALES	AVE PRICE	MED PRICE	MEDIAN	MEAN	WEIGHTED	COD	< 105	> 105	PRD
Multi-Family	59	8,103,541	1,650,000	88.3	86.8	70.6	18.8	47	12	1.23

Sales Ratio Report Using Proposed 2018 Values

2016 SALES RATIOS BY NEIGHBORHOOD: MULTI-FAMILY

NB NAME	SALES	AVE PRICE	MED PRICE	MEDIAN	MEAN	WEIGHTED	COD	< 105	> 105	PRD
2 ANACOSTIA	1	1,110,000	1,110,000	105.4	105	105.4	.0	0	1	1.00
3 BARRY FARMS	1	620,000	620,000	72.8	72.8	72.8	.0	1	0	1.00
6 BRIGHTWOOD	3	3,520,000	4,400,000	114.3	111	110.4	6.5	1	2	1.00
9 CAPITOL HILL	3	2,398,333	2,500,000	82.4	78.9	76.3	17.2	3	0	1.03
12 CHILLUM	2	969,665	969,665	129.9	130	130.1	3.1	0	2	1.00
15 COLUMBIA HEIGHTS	6	2,430,833	2,155,000	95.4	87.4	88.5	13.4	6	0	.99
16 CONGRESS HEIGHTS	7	3,601,357	695,000	102.0	99.5	86.6	10.7	5	2	1.15
18 DEANWOOD	3	408,787	401,480	124.0	112	107.4	14.2	1	2	1.04
22 FORT DUPONT PARK	4	3,339,375	2,228,750	97.8	98.0	97.5	2.3	4	0	1.00
25 GEORGETOWN	1	3,300,000	3,300,000	70.3	70.3	70.3	.0	1	0	1.00
28 HILLCREST	3	1,013,333	975,000	98.6	97.1	98.1	2.2	3	0	.99
29 KALORAMA	2	7,594,500	7,594,500	99.6	99.6	94.3	7.9	1	1	1.06
33 MARSHALL HEIGHTS	3	1,021,500	785,000	102.0	99.2	96.0	6.3	2	1	1.03
36 MOUNT PLEASANT	1	3,800,000	3,800,000	105.3	105	105.3	.0	0	1	1.00
39 OLD CITY #1	5	43,802,000	7,500,000	85.1	79.8	68.0	18.8	5	0	1.17
40 OLD CITY #2	3	19,400,000	2,600,000	100.1	95.9	84.2	7.5	2	1	1.14
41 PALISADES	1	900,000	900,000	91.4	91.4	91.4	.0	1	0	1.00
42 PETWORTH	3	3,247,578	2,700,000	95.9	96.9	101.3	14.0	2	1	.96
43 RANDLE HEIGHTS	1	520,000	520,000	99.1	99.1	99.1	.0	1	0	1.00
48 SHEPHERD PARK	2	1,970,000	1,970,000	98.3	98.3	98.1	1.1	2	0	1.00
49 16TH STREET HEIGHTS	3	1,241,667	1,100,000	97.7	97.4	97.3	2.9	3	0	1.00
52 TRINIDAD	1	77,875,000	77875000	96.2	96.2	96.2	.0	1	0	1.00
TOTALS:										
PROPERTY TYPE	SALES	AVE PRICE	MED PRICE	MEDIAN	MEAN	WEIGHTED	COD	< 105	> 105	PRD
Multi-Family	59	8,103,541	1,650,000	97.8	96.1	81.2	12.2	45	14	1.18

Sales Ratio Report Using Current 2017 Values

2016 SALES RATIOS BY NEIGHBORHOOD: COMMERCIAL

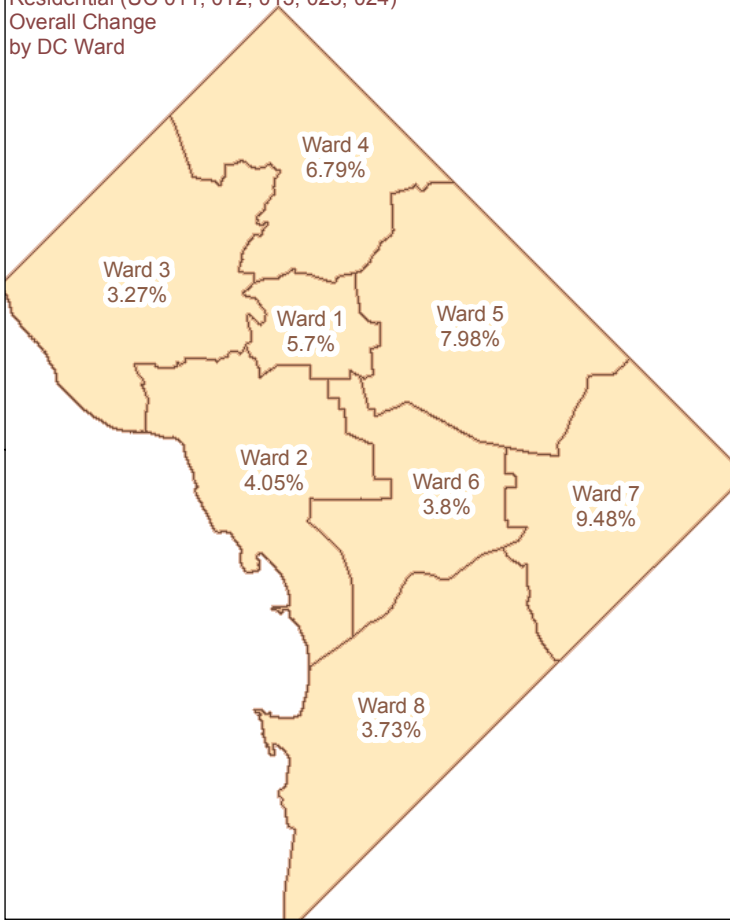
NB NAME	SALES	AVE PRICE	MED PRICE	MEDIAN	MEAN	WEIGHTED	COD	< 105	> 105	PRD
1 AMERICAN UNIVERSITY	2	15,262,500	15262500	84.5	84.5	84.6	4.0	2	0	1.00
2 ANACOSTIA	4	921,500	433,000	86.8	96.5	125.6	29.5	3	1	.77
3 BARRY FARMS	1	1,000,000	1,000,000	49.2	49.2	49.2	.0	1	0	1.00
5 BRENTWOOD	5	3,252,200	2,400,000	63.3	64.9	64.7	30.3	4	1	1.00
6 BRIGHTWOOD	2	545,000	545,000	66.4	66.4	66.5	.4	2	0	1.00
7 BROOKLAND	6	889,413	877,500	90.9	80.6	69.2	23.7	5	1	1.16
9 CAPITOL HILL	6	1,624,228	1,411,500	70.2	74.5	67.6	40.8	5	1	1.10
10 CENTRAL	17	42,412,219	17800000	89.9	81.0	82.2	19.6	16	1	.99
11 CHEVY CHASE	4	5,044,135	2,714,000	98.1	88.3	86.4	11.9	4	0	1.02
13 CLEVELAND PARK	1	86,065,000	86065000	110.3	110	110.3	.0	0	1	1.00
15 COLUMBIA HEIGHTS	18	2,237,716	975,000	75.0	73.7	68.0	22.7	18	0	1.08
16 CONGRESS HEIGHTS	5	1,384,000	700,000	92.5	113	82.0	52.1	4	1	1.38
18 DEANWOOD	1	950,000	950,000	83.4	83.4	83.4	.0	1	0	1.00
19 ECKINGTON	4	1,340,825	829,500	53.5	57.4	71.4	46.1	4	0	.80
20 FOGGY BOTTOM	2	37,733,283	37733283	90.5	90.5	102.4	13.4	2	0	.88
24 GARFIELD	1	2,950,000	2,950,000	57.6	57.6	57.6	.0	1	0	1.00
25 GEORGETOWN	12	13,528,750	1,075,000	77.8	74.6	85.6	20.5	12	0	.87
29 KALORAMA	6	5,529,167	2,050,000	77.4	89.5	86.3	32.5	4	2	1.04
31 LEDROIT PARK	1	1,050,000	1,050,000	42.6	42.6	42.6	.0	1	0	1.00
36 MOUNT PLEASANT	7	3,181,429	1,700,000	61.8	61.0	58.8	9.2	7	0	1.04
39 OLD CITY #1	23	3,628,835	1,100,000	72.1	77.4	78.8	38.0	18	5	.98
40 OLD CITY #2	25	4,152,923	2,575,000	60.2	69.5	66.9	39.4	23	2	1.04
42 PETWORTH	10	1,333,010	1,100,000	62.1	68.9	59.1	30.5	9	1	1.16
44 NOMA	4	90,198,750	71387500	78.9	77.0	85.5	13.8	4	0	.90
49 16TH STREET HEIGHTS	4	787,103	795,000	60.8	67.2	49.7	37.0	3	1	1.35
51 TAKOMA PARK	1	420,000	420,000	54.6	54.6	54.6	.0	1	0	1.00
52 TRINIDAD	1	410,000	410,000	126.8	127	126.8	.0	0	1	1.00
56 WOODRIDGE	4	1,447,500	1,312,500	56.9	59.8	58.4	13.8	4	0	1.02
TOTALS:										
PROPERTY TYPE	SALES	AVE PRICE	MED PRICE	MEDIAN	MEAN	WEIGHTED	COD	< 105	> 105	PRD
Commercial	177	10,264,642	1,450,000	72.7	75.6	83.2	31.3	158	19	.91

Sales Ratio Report Using Proposed 2018 Values

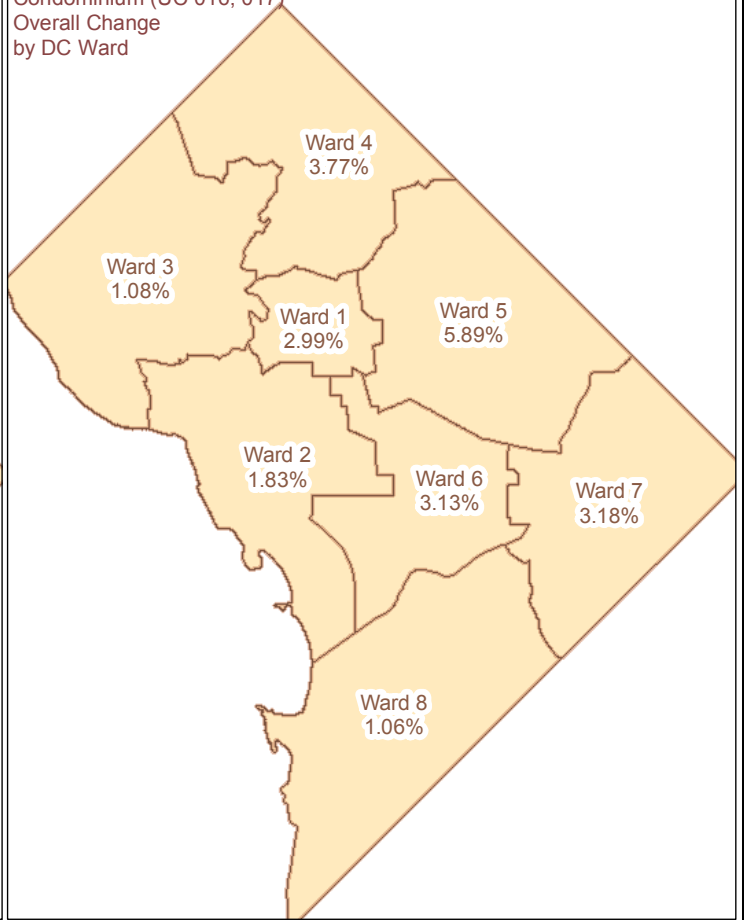
2016 SALES RATIOS BY NEIGHBORHOOD: COMMERCIAL

NB NAME	SALES	AVE PRICE	MED PRICE	MEDIAN	MEAN	WEIGHTED	COD	< 105	> 105	PRD
1 AMERICAN UNIVERSITY	2	15,262,500	15262500	95.4	95.4	95.4	.6	2	0	1.00
2 ANACOSTIA	4	921,500	433,000	98.6	94.6	99.1	7.1	4	0	.95
3 BARRY FARMS	1	1,000,000	1,000,000	90.4	90.4	90.4	.0	1	0	1.00
5 BRENTWOOD	5	3,252,200	2,400,000	75.0	80.5	81.6	28.5	4	1	.99
6 BRIGHTWOOD	2	545,000	545,000	91.1	91.1	93.6	5.3	2	0	.97
7 BROOKLAND	6	889,413	877,500	93.4	95.7	93.2	4.7	6	0	1.03
9 CAPITOL HILL	6	1,624,228	1,411,500	86.5	89.1	80.4	27.0	5	1	1.11
10 CENTRAL	17	42,412,219	17800000	94.1	92.7	93.1	8.0	16	1	1.00
11 CHEVY CHASE	4	5,044,135	2,714,000	100.0	101	100.4	.7	4	0	1.00
13 CLEVELAND PARK	1	86,065,000	86065000	93.5	93.5	93.5	.0	1	0	1.00
15 COLUMBIA HEIGHTS	18	2,237,716	975,000	89.8	87.5	74.7	10.8	18	0	1.17
16 CONGRESS HEIGHTS	5	1,384,000	700,000	96.2	93.2	67.4	18.9	4	1	1.38
18 DEANWOOD	1	950,000	950,000	94.7	94.7	94.7	.0	1	0	1.00
19 ECKINGTON	4	1,340,825	829,500	89.1	85.6	87.8	7.7	4	0	.97
20 FOGGY BOTTOM	2	37,733,283	37733283	90.7	90.7	100.7	11.2	2	0	.90
24 GARFIELD	1	2,950,000	2,950,000	94.1	94.1	94.1	.0	1	0	1.00
25 GEORGETOWN	12	13,528,750	1,075,000	94.1	92.6	98.2	3.3	12	0	.94
29 KALORAMA	6	5,529,167	2,050,000	81.4	97.3	89.7	23.8	4	2	1.09
31 LEDROIT PARK	1	1,050,000	1,050,000	90.4	90.4	90.4	.0	1	0	1.00
36 MOUNT PLEASANT	7	3,181,429	1,700,000	93.0	90.9	91.5	3.0	7	0	.99
39 OLD CITY #1	23	3,628,835	1,100,000	93.1	97.0	90.1	14.9	18	5	1.08
40 OLD CITY #2	25	4,152,923	2,575,000	87.6	83.9	87.5	15.8	22	3	.96
42 PETWORTH	10	1,333,010	1,100,000	80.3	87.9	74.7	18.2	8	2	1.18
44 NOMA	4	90,198,750	71387500	83.5	85.4	85.9	4.3	4	0	.99
49 16TH STREET HEIGHTS	4	787,103	795,000	88.4	89.8	80.3	23.3	3	1	1.12
51 TAKOMA PARK	1	420,000	420,000	94.0	94.0	94.0	.0	1	0	1.00
52 TRINIDAD	1	410,000	410,000	126.1	126	126.1	.0	0	1	1.00
56 WOODRIDGE	4	1,447,500	1,312,500	74.2	74.8	67.1	20.3	4	0	1.12
TOTALS:										
PROPERTY TYPE	SALES	AVE PRICE	MED PRICE	MEDIAN	MEAN	WEIGHTED	COD	< 105	> 105	PRD
Commercial	177	10,264,642	1,450,000	92.1	90.6	91.1	13.0	159	18	.99

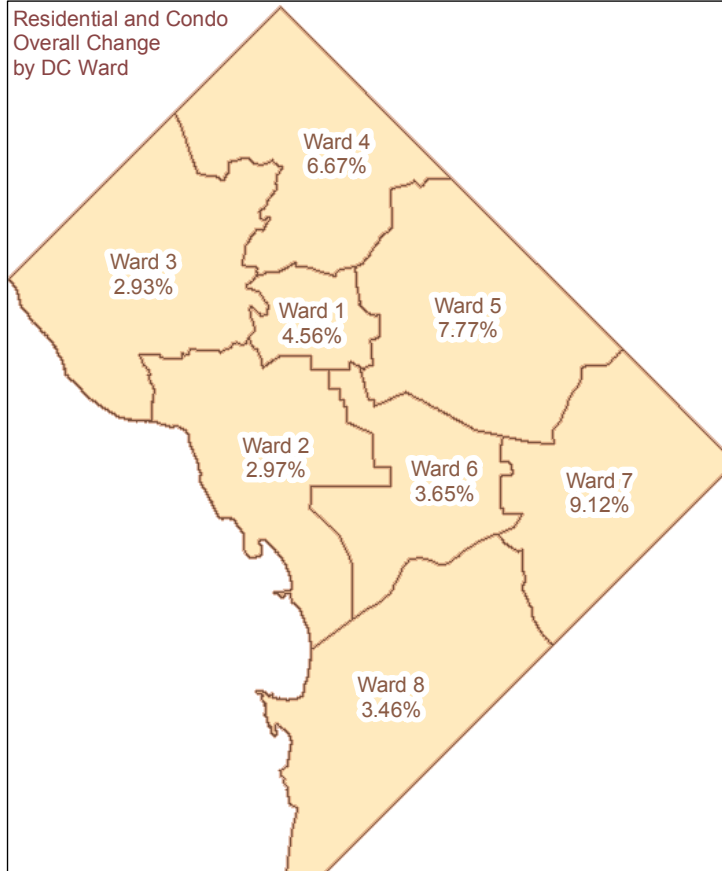
Residential (UC 011, 012, 013, 023, 024)
Overall Change
by DC Ward



Condominium (UC 016, 017)
Overall Change
by DC Ward



Residential and Condo
Overall Change
by DC Ward

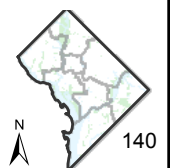


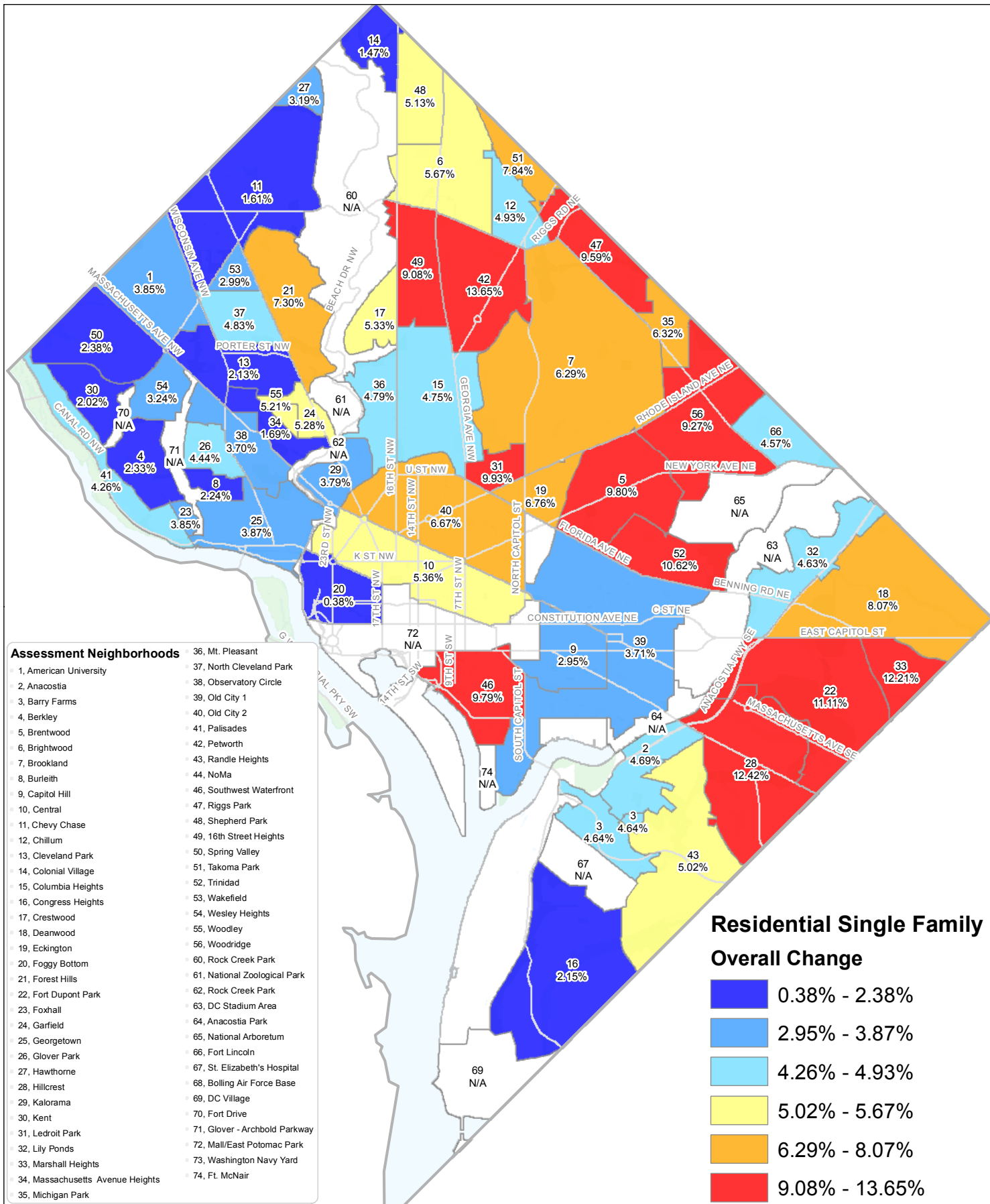
TY *2018 Residential Change by DC Ward

0 0.5 1 2
Miles

*** Office of Tax and Revenue
OTR Real Property Assessment Division
GIS Geographic Information Systems
Date: 2/24/2017

* Proposed 2018 Assessment Values



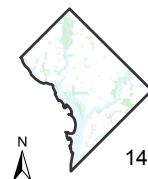


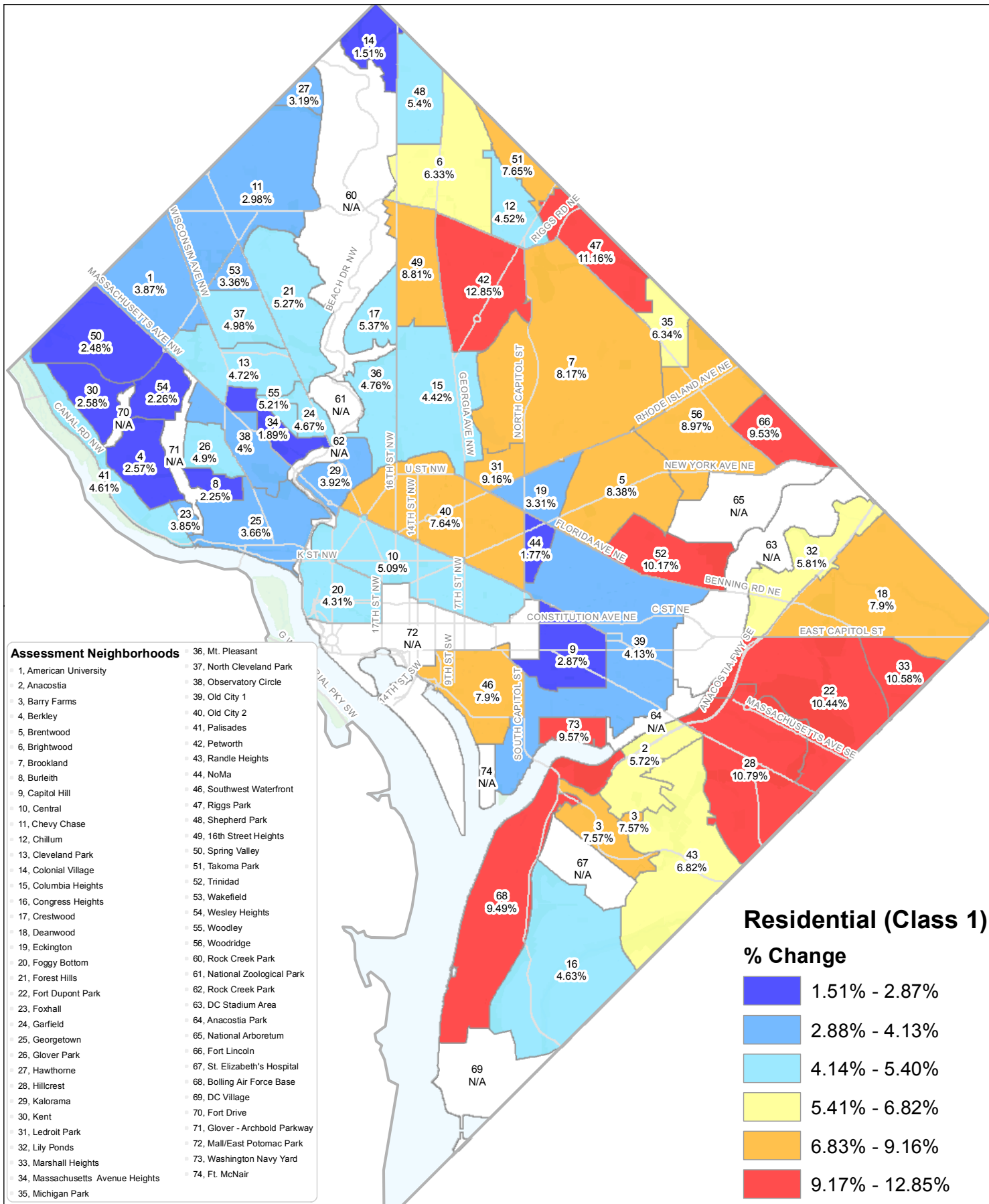
TY *2018 Residential Single Family Overall Change by Assessment Neighborhood

0 0.5 1 2 Miles

*** Office of Tax and Revenue
 *** Real Property Assessment Division
 *** Geographic Information Systems
 Date: 2/23/2017

* Proposed 2018 Assessment Values



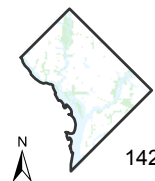


TY *2018 Residential (Class 1) Base Change by Assessment Neighborhood

0 0.5 1 2 Miles

*** Office of Tax and Revenue
 *** Real Property Assessment Division
 *** Geographic Information Systems
 Date: 2/27/2017

* Proposed 2018 Assessment Values



District of Columbia Assessment Neighborhoods and Wards

