



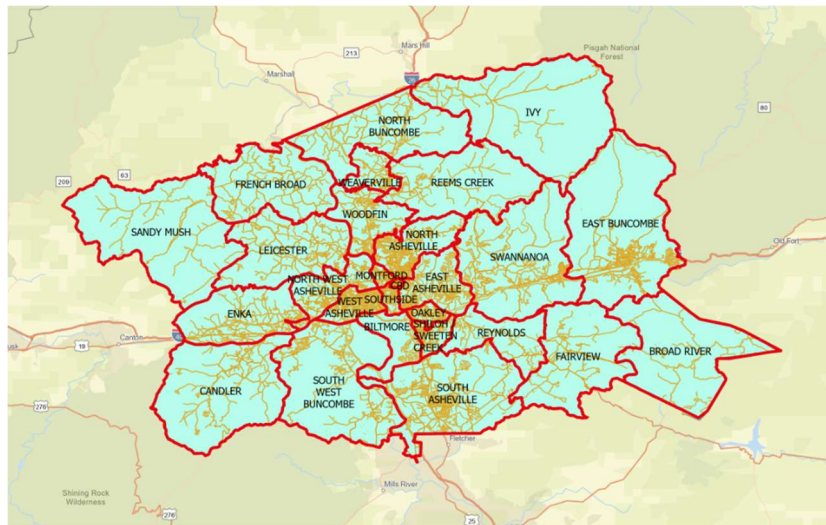
KEENE MASS APPRAISAL CONSULTING
SENSIBLE SOLUTIONS.



Assessment Equity Study Report Buncombe County North Carolina June 2024

By Kevin Keene

Keene Mass Appraisal Consulting



KEENE MASS APPRAISAL CONSULTING
Keenemac.com

6934 Cresheim Rd
Philadelphia Pa 19119

Phone: 267.307.6071
E-mail: kevin@keenemac.com

Table of Contents

1.0 Executive Summary	4
2.0 Organization of This Report.....	8
3.0 Questions and Answers.....	8
4.0 Managing Expectations	8
4.1 Limitations of Mass Appraisal	8
4.2 Workforce Capacity	9
4.3 Gentrification	9
4.4 Frequency of Revaluation.....	10
4.5 Re-Listing Property Attributes	10
4.6 Resident Migration.....	11
4.7 Tax Relief	11
5.0 Background and Qualifications	11
5.1 Process	12
5.2 Appeals.....	13
6.0 Goals and Objectives.....	13
6.1 The first objective is to define the problems that we are addressing.....	13
6.1.1 Systemic vs Anecdotal Bias	14
6.1.2 Keep the focus on Assessments	14
6.2 Second Objective Determine the Extent of Bias	16
6.3 Third Objective Identify Sources of Bias	16
6.4 Fourth Objective Make Recommendations for Improvement	17
6.5 Fifth Objective Address Published Reports	17
7.0 Data Sources.....	17
7.1 Sales Data	17
7.2 Parcel Data	17
7.3 Demographic Data.....	17
7.4 Shape Files.....	17
8.0 Terms and Definitions	18
8.1 International Association of Assessing Officers (IAAO)	18
8.2 Market Value	18
8.3 Assessment Bias	19

8.4 Qualified Sales Data	19
8.5 Demographic Classes	19
9.0 Overview of the Problem	21
9.1 Common Problems with Bias Analysis	25
10.0 Legacy of Practice and Current Practice.....	26
10.01 Current Environment.....	26
10.02 Transparency	27
10.03 2025 Reappraisal	28
10.04 Staffing	28
11.0 Overview of the County	29
11.1 Communities and Neighborhoods	30
11.2 Markets and Sub-Markets.....	30
12.0 Assessment Performance.....	32
12.1 Ratio Studies	33
12.2 Disqualifying Transactions.....	34
12.3 Adjusting sales data for time.....	40
12.4 Outlier Removal	41
13.0 Ratio Study Results for Buncombe County	42
13.1 Set 1 – Current Value to Price – All Sales	43
13.2 Set 2 – Current Value to Price – Some Sales Disqualified and Outliers Removed.....	43
13.3 Set 3 – Current Value to Price Adjusted to December 2023 – All Sales	44
13.4 Set 4 - Current Value to Price Adjusted to December 2023 – Some Sales Disqualified and Outliers Removed ...	44
13.5 Set 5 – Current Value to Price Adjusted to January 2021 – All Sales	45
13.6 Set 6 – Current Value to Price Adjusted to January 2021 -	45
13.7 Set 7 – Modeled Value to Price Adjusted to December 2023 – All Sales.....	54
13.8 Set 8 - Modeled Value to Price Adjusted to December 2023 – Some Sales Disqualified and Outliers Removed .	54
13.9 Ratio Study Conclusions	61
14.0 Representation	61
14.1 Group Summary Method	62
14.1 Group Summaries	64
14.2 Conclusions from the Representation Study.....	68
15.0 Sub-System Analyses.....	69
15.1 Sales Validation	69
15.2 Property Data Collection	70

15.3 Neighborhood Definitions and Delineations.....	72
15.4 Valuation Process	73
15.41 Regression models	75
15.5 Market Value Review.....	76
15.6 Data Quality Analysis.....	76
16.0 Bias Analysis	77
16.1 Indications	77
16.2 Sources of Bias	77
17.0 Recommendations	78
17.1 Workforce.....	78
17.2 Sub-systems.....	79
17.21 Data Management	80
17.22 Training.....	80
17.23 Valuation Methods.....	81
17.24 Other	81
18.0 Conclusions	81
Appendix A Common Constituent Questions and Answers.....	83

Assessment Equity Study Report for Buncombe County North Carolina

1.0 Executive Summary

There is a perception that Buncombe County currently over-assesses poor people and communities of color. In addition, there is also a perception that the county under-assesses wealthy, primarily white communities. This report presents a qualified study into the existence of bias in the real property assessments in Buncombe County, identifies sources of bias, and makes actionable recommendations for improvement in assessment equity.

The work for this project includes:

- Touring the county to gain familiarity with elements that impact mass appraisal
- Building a database of parcels and sales
- Creating a schema for grouping comparable properties in both the sales and parcels data
- Merging the assessor's data with census data to support analysis of bias in terms of race and income
- Interviewing county administrators, assessment office staff, innovations officers, and others
- Examining staffing levels and organization of the Assessment office
- Learning the history of legacy neighborhoods and assessment practices
- Studying hours of video about the history of the county, particularly as it relates to minority residents and communities
- Viewing recorded meetings of the AD Hoc Reappraisal Committee
- Meeting and sharing information with the Buncombe County Communications team
- Examining the valuation process and sub-systems to identify bias and/or potential sources of bias
- Building regression models to accurately calculate time adjustments for sale prices and to identify outliers for disqualification from the ratio study
- Calculating time adjusted sale prices for all sales as of both January 2021 and December 2023
- Comparing property attributes at time of sale to current attributes to disqualify transactions where the price paid is not related to the assessed value
- Running ratio statistics by Communities; Development Class (Urban/Suburban/Rural); Census Block Groups; Property Types; Size Class; time period of construction; Price Class; Race Class; Income Class; Combined Race and Income Classes; Property Condition; and submarkets
- Identifying properties in groups with no sales and classifying unrepresented properties
- Examining distribution of disqualified sales
- Examining distribution of assessment errors
- Reporting findings to Buncombe County stakeholders
- Analyzing the values for the year 2025 reappraisal when values are available
- Periodic monitoring of progress in preparation for the next reappraisal

Conclusions:

- No evidence of systemic racial or income bias. Some indications of bias were found, in favor of or against price classes, condition of improvements, and property types.
- No evidence of overt political interference. This statement is a very important element of this report. Political interference is common in the assessment process. Where it exists, it is often imbedded and intentional. Examining the legacy of practice exposes the roots of such interference, which is then identifiable through a

variety of statistical processes. Allegations of bias in assessments frequently imply malfeasance on the part of the jurisdiction.

- No evidence of bias in the attitudes of the workforce. Bias is frequently found in the often unconscious attitudes of those who work in the system. Examination of workflows and interviews with staff showed no causes for concern and therefore, no support for a bias allegation.
- The appraisal process is overall “Blind and Fair” and does not consider demographics in producing estimates of value. This does not imply that the process is perfect or without room for improvement.
- Bias is entering the valuation process through Data Collection; Valuation Process, Sales Validation, and Neighborhood Definitions and Delineations. Improvements are needed in those areas.
- The assessment office is understaffed. They are maximizing the use of technology, but the current level of staffing limits what the office can achieve and needs to be addressed.

Observations of the current state of the Buncombe County Assessment Office:

- A progressive approach to the work. They are well-versed in the industry standards, and adhere to standards and guidelines to a large degree, and aspire to follow those with which they are not yet in compliance.
- Excellent general domain knowledge. They understand the nuances of the work and the unique problems that the market and its sub-markets present, and take creative and innovative approaches to solving problems.
- A modern Computer Aided Mass Appraisal (CAMA) system that has the capacity to store, retrieve, modify and present data.
- They use an implementation of the Modified Cost approach, which is not ideal for residential properties, but they have gotten excellent results in each of the last two reappraisals, due mainly to the skill of the staff.
- An outstanding Transfer Processing system. Deeds processing and reporting is a bottleneck in many jurisdictions, but this system is remarkably efficient.
- Great use of GIS (Geographic Information Systems) to maintain parcels; produce ‘smart’ maps; and create interactive dashboards to assist the staff and inform the public.
- They have the best available aerial and street level imagery, with the capacity to integrate self-generated images into the system.
- They have Change Detection software that can identify properties that have built additions or made substantial changes.
- They have a contractor that uses the change detection program to update building sketches and measurements in the CAMA system.
- A paperless permitting system that integrates with the CAMA system.
- An ‘AI’ model that periodically estimates values. This model is not used for production purposes, but to identify possible data errors and to validate land values and neighborhood adjustments.
- They have a CAMA add-on system that can find comparable properties and sales for specific properties. This is primarily used for customer inquiries, and answering complaints and appeals. This system can also be used to implement regression models, although it is not ideal for the development and iterative testing and specification of those models.
- They produce sound analytics.
- They are efficiently organized to maximize the capacity of the staff.
- They do an excellent job of communication, public outreach and promoting transparency.
- The way that they define neighborhoods is objective and based on data and property attributes.
- They do not rely on vestiges of legacy practice that would generate bias.

It is my opinion that the practice of mass appraisal in Buncombe County is fair and not biased in favor of or against any *demographically* identifiable group. Reports that have been published alleging or supporting allegations of bias suffer from the serious deficiencies enumerated in section 9.1 of this report, rendering them unreliable as credible sources of information.

The perception of bias should be acknowledged and addressed through increased public outreach and education, and encouraging constituents to engage with the Assessment office with both general and specific questions or concerns. Additional transparency regarding the valuation process is recommended, as there are general misconceptions surrounding the methods by which values are determined.

Compilation of Recommendations:

In the course of this work, I was able to identify possible sources or entry points for bias and make recommendations for changes or improvements to the mass appraisal practice in the county. These recommendations are iterated in more detail in **Section 17** of this report. Some of these recommendations have been adopted by the Assessment Office and may impact the 2025 reappraisal.

Workforce

Recommendation: Increase the number of permanent appraisal staff to comply with IAAO guidelines.

Recommendation: Create a Customer Unit to handle complaints and inquiries.

Recommendation: Create a three-person Modeling and Analysis Unit.

Recommendation: Create a specialty for manufactured homes, modular homes and unusual properties.

Recommendation: Partner with local universities to create an internship program to augment the appraisal staff.

Sub-systems

Recommendation: Create a process to identify transactions that involve out-of-market buyers.

Recommendation: Identify out-of-county buyers for purposes of sales validation.

Recommendation: Create a specialty role or unit for the valuation of luxury homes.

Recommendation: Expand the Sales Validation Unit to at least two full time employees.

Recommendation: When conducting ratio studies, use only sales data that has been validated, and making sure the attributes of the property at the time of valuation are the same as the attributes that were present at the time of sale.

Recommendation: Use regression models to isolate the effects of time in various sub-markets and adjust all prices calibrated to a common target date.

Recommendation: Make the classification of Rural, Suburban or Urban based on Census Block Groups instead of Communities.

Recommendation: Increase capacity in the Assessor's Office to allow for a relisting of attributes and periodic field inspections on a regular cycle.

Recommendation: Change the definition of 'Neighborhood'.

Recommendation: Create a unique set of location definitions for each property class.

Data Management

Recommendation: Identify Entry Level, Discretionary and Externally Driven sub-markets.

Recommendation: Create an Owner Filter table to identify and possibly invalidate sales to entities that do not represent typical market activity.

Recommendation: Field-check properties in the 8 Census Block Groups that represent disadvantaged communities to reduce the number of properties that will be overvalued based on condition.

Recommendation: Create a workflow to support observation of properties in the cycle of decline.

Training

Recommendation: Revise the definition of valid transactions to include only transactions that are indicators of the value of comparable properties.

Valuation Methods

Recommendation: Add sales regression modeling to the valuation process.

Recommendation: Build and maintain machine learning models in house.

Recommendation: Use spatial attributes to capture key relationships between parcels.

Recommendation: Add spatial attributes to the valuation process.

Other

Recommendation: Play informational video files on a loop in the public access areas of the Assessor's Office.

Recommendation: Incorporate Group Summaries into market value review and as an online resource for constituents.

Recommendation: Improve tools for reviewing and revising projected values.

Recommendation: Engage with the North Carolina State Legislature to expand the options for tax relief for constituents.

2.0 Organization of This Report

This report has been written to clearly communicate findings, conclusions, and recommendations to all stakeholders. It will focus is on what was done, why those things were done, and the results of tests and analyses.

The technical aspects of this report, including data, statistics, charts, and tables supporting the conclusions and recommendations are presented in appendices. They are specifically referenced for those readers who desire a deeper understanding.

3.0 Questions and Answers

Constituents and analysts have asked many questions regarding assessments in Buncombe County. These questions and answers can be found in Appendix A: *Common Constituent Questions and Answers*.

4.0 Managing Expectations

4.1 Limitations of Mass Appraisal

It is important in understanding this work to recognize the limits of what any assessment office can achieve. Listening to stakeholders and reading other published analyses demonstrate limited understanding of what mass appraisal is and how it works, leading to an unrealistic expectation of what the assessor can achieve.

Mass appraisal is an exercise in estimating market value by establishing one or more central tendencies and accounting for variance away from the central tendency(ies) for various attributes that effect value. The primary goal is to produce estimates of value that are uniform and where variance can be traced back to specific attributes. Accuracy of the estimates of value are an important, but secondary, consideration. This is true no matter which approach to value – Sales, Cost or Income – is used.

Any application of a central tendency tends to pull the higher valued properties down towards the center and raise the lower valued properties up towards that same center. This means there is an inherent tendency to overvalue low-end properties and undervalue high-end properties. The best any mass appraisal system can hope for is to mitigate these effects, but they can never be completely eliminated. Some analysts run ratio studies and present normal observation of variance in the statistics as evidence of bias. *As long as the statistics fall within the IAAO standards, some degree of variance is normal, and lower or higher median ratios or CODs are expected.*

Another difficulty in mass appraisal is that all property appraisal - whether mass appraisal or fee appraisal – relies on the presumption that attributes define value. If we know the attributes of a property that has sold, we can predict the value of a similar property that has not sold. In my experience, all markets have submarkets or subsets of the inventory where properties do not transact based on the attributes of the properties. Therefore, variance from the predicted values arises that cannot be explained by any mass appraisal system. This is particularly true in the low and high ends of the price spectrum and in disadvantaged communities to the degree that those communities correlate with price categories. In high-end properties, buyers will pay premiums for unique features that are not recognized in the Assessor's data file (or are so rare that they are statistically insignificant) or may have personal motivations for buying that specific property that induce them to pay much more than any other buyer would offer. In these cases, the estimates of value may be lower than the observed price, leading to the appearance of under-valuation. In low-end properties, we find more predatory speculation, tangled titles, bid sales, foreclosures, sellers that are under duress, other activity that does not represent typical or predictable market activity as well as inaccurate attribute capture in the Assessor's data files and it is much

more common to estimate values for these properties that may be higher than observed prices, leading to the appearance of over-valuation. Proper sales validation can identify these properties or transactions and disqualify them from consideration in either statistical analyses or the valuation process.

Assessment is, at best, an imprecise science. The goal of the Assessor is to produce values that are uniform and fair. Accuracy isn't necessarily part of the bargain. (The title of IAAO's publication is "Fair and Equitable" – not "Fair and Accurate") The best models will be able to predict values within 10% of time adjusted prices between 70% and 90% of the time, which means they will be somewhat less accurate at least 10% to 30% of the time. It is easier to achieve higher degrees of accuracy and uniformity when the housing stock is more homogenous. In urban and rural environments, housing stock is rarely homogenous, so higher degrees of variance in both price and value are expected. Buncombe County is largely composed of non-homogenous housing stock, so the challenges of producing accurate estimates of value is greater here than in many other environments.

For these reasons, the expectation that low-end and high-end properties will exhibit the same assessment performance statistics is simply not reasonable. IAAO has established benchmarks for assessment performance. These are discussed in section 13.6. As long as performance statistics for various sub-markets fall within the prescribed ranges, we can say that there is no bias. There is, and never will be, a set of 'perfect' assessments. Assessors should strive to minimize the magnitude of errors and ensure that errors are randomly distributed.

4.2 Workforce Capacity

There is a common perception that the Assessment office is adequately staffed and has the tools and expertise to perform all of the required functions. In my experience, I have yet to encounter an office that is over-staffed. The vast majority have difficulty in hiring and retaining an adequate workforce. Many offices, including the Buncombe County office, are doing the best they can with the resources they have. They know that there are ways that they can improve performance, but simply do not have the staff to make those improvements.

Jurisdictions need to understand that investing in the assessment office pays big dividends. By having enough staff to collect data and ensure data quality; modernizing the valuation process by employing modelers, data analysts, and GIS professionals; and improving transparency and public relations by adding community liaisons and communication specialists to the workforce, the Assessor can not only raise more revenue by keeping the property tax base accurate and current and increasing the frequency of reappraisals, but will give back less in appeals, complaints and court cases. The Buncombe County office has great people in key positions, but they are critically short staffed.

4.3 Gentrification

Gentrification is a controversial topic in Buncombe County and in cities and counties across the country. There are many definitions, none of which are universally accepted. In general terms it describes a process by which the character and composition of a poor area is changed by an influx of wealthier people and businesses that raises prices and values and eventually displace the current inhabitants. In some circles, the Assessor is alleged to participate in or accelerate this process by proactively raising taxes in these areas to 'drive the current residents out'. *There is no accepted system of mass appraisal that proactively raises market values.* Increases in value and assessments are always in response to observed market activity. The Assessor does not control or manipulate the market. Gentrification is a complex social phenomenon that can be addressed by providing incentives for the current residents to stay and/or disincentives for them to sell their properties. At its heart, it is a quality-of-life issue, not a taxation issue. I have heard many discussions about gentrification over the years, but to the best of my knowledge, no one has solved this problem yet. Buncombe County is attracting buyers from outside of the local economy and is subject to the pressures that these buyers bring.

Affordable housing is in short supply, and there are other circumstances – such as the lack of a robust public transit system - that make the county less attractive for lower income residents. *The Assessor cannot solve the problem of gentrification.* That being said, it is incumbent on the Assessor to utilize a mass appraisal process that is resistant to raising all values in any neighborhood based on a few sales that may not be representative of the unsold properties. This is discussed in detail in the **Valuation Process 15.4** section of this report.

4.4 Frequency of Revaluation

North Carolina statute calls for a reappraisal every eight years, or when the yearly reported median ratio falls below 85% or rises above 115%. Buncombe County routinely plans for a revaluation on a four-year cycle. The Assessor is currently conducting a reappraisal for 2025, four years after the last reappraisal in 2021.

There are constituents that are suggesting more frequent reappraisals. Due to the rapid increases in price in almost all submarkets since the last reappraisal, the median ratio has fallen dramatically, meaning that the county is losing potential revenue as the market outpaces assessments.

A reappraisal should not be undertaken if the limitations of the mass appraisal staff do not allow for an effective and reasonably uniform and accurate project. A reappraisal should improve, not degrade, performance. A reappraisal project that makes things worse for constituents should not be undertaken. There must be enough time between reappraisals to allow this feedback loop to play out:

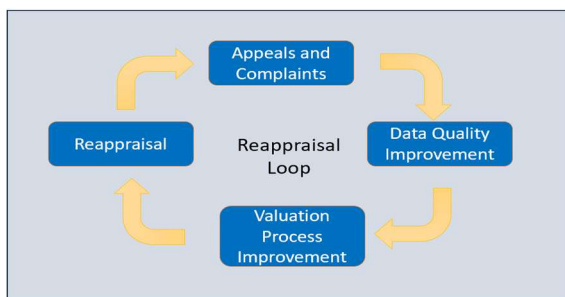


Figure 4.4 The Reappraisal Feedback Loop

Figure 4.4 illustrates that a reappraisal generates complaints and appeals, which leads to improvements in data quality and even the valuation process itself, which allows for another reappraisal. This cycle takes at least two years.

Given the current staffing level of the Assessment office, it is not realistic to consider moving to more frequent reappraisals. Adequately staffing the office will open discussion for more frequent reappraisals.

4.5 Re-Listing Property Attributes

A re-listing is the gathering and validation of property attributes for most or all 133,000 parcels in the county. While some attributes are fixed - such as lot size, topography or quality of construction - others are subject to change over time and require frequent observation to maintain data quality and possibly update values based on changes to the property. IAAO recommends visiting each property every four to six years. While some attributes can be validated by desktop review of aerial imagery, others require site visits.

The Assessor does not have the staff to conduct site visits for the 2025 reappraisal and estimates that it would cost \$2.2 million to execute a re-listing. There should be no expectation that the data used for the 2025 reappraisal will include site visits for most properties.

4.6 Resident Migration

A migration study examines where people who buy properties in the county come from and where those who sell properties go after the sale. Considering the pressure that the Buncombe County market is under from buyers coming from outside of the area, and the concerns of where those displaced by gentrification are going, a migration study would be useful in examining equity not only in assessments, but in other ways that would benefit the county. The Assessment office is examining deed transfer records in order to identify external buyers for sales validation, but the second part – where the sellers go after completing the transaction – is outside of the capacity of the office. There should be no expectation that the Assessor's office will be able to execute a migration study.

4.7 Tax Relief

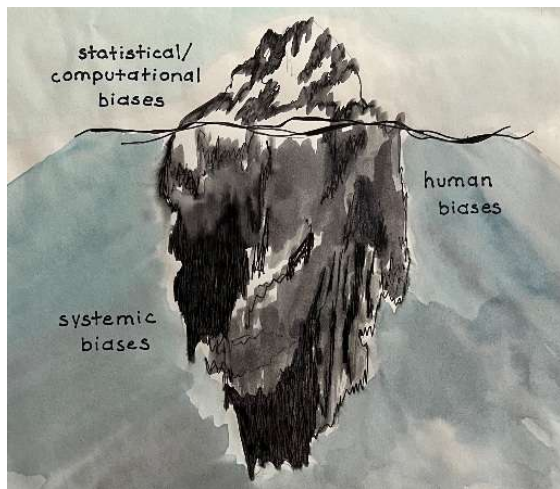
Jurisdictions across the country that have done reappraisals in the post-covid times have found that prices have increased dramatically. Many have had to enact 'circuit breakers' to provide relief for constituents facing property tax increases that often exceed 50%. Buncombe County will see large increases in assessed values in many communities in the 2025 reappraisal. Rising prices have caused the median ratio to fall precipitously. Using recorded price against current values to measure the ratio yields a median of about 80%. Adjusting prices for time gives a more accurate median ratio of about 65%. (**See figure 13.0**). Based on the time adjustment matrices developed for this report, rural communities could see increases of 81.8% since 2020; Suburban communities are up 64.8% in the same time period; and Urban communities are up 56.7%. North Carolina law leaves very little room to provide tax relief for constituents in the form of homestead exemptions, caps on tax increases, split tax rates or other measures that have been taken elsewhere. County administrators are urged to consider relief measures for homeowners.

5.0 Background and Qualifications

I have been working in mass appraisal for over thirty years. Most of my experience has been with the City of Philadelphia, where I served as a Real Property Evaluator; Mass appraisal Analyst; Real Property Supervisor; GIS Manager; Appeals, Customer Service and Exemptions Administrator; Residential Administrator; Modeling Director and Director of Mass Appraisal and Analysis. I personally designed and directed over sixteen major revaluation projects. Over period spanning decades, I was part of an ongoing effort to build an assessment system that was more objective and fairer. I created custom neighborhood definitions; built a CAMA system; introduced GIS to the department; created a sales file to support mass appraisal; instituted a system of sales validation; created persistent and consistent groups to support valuation and analysis; developed a catalog of regression models that are used to estimate values and promoted a well-documented process that improved transparency and public understanding of assessments. I have trained many appraisers, modelers and analysts. I have mentored and worked with offices and practitioners from around the world. I have been a frequent presenter and workshop facilitator at IAAO and URISA conferences. I have retired from my position with the City of Philadelphia and now serve as a mass appraisal consultant.

In my work, I always took care to ensure that demographics were not part of the valuation process. I purposely designed a system of defining locations for mass appraisal that was based entirely on sale prices for comparable properties and completely blind to demographics. The definitions and processes that I use for mass appraisal do not create "poor neighborhoods" or "minority neighborhoods". How can a demographically agnostic system be biased? My research and

experience have found that there are many ways that bias can find its way into *any* assessment process. There are also many misconceptions about what mass appraisal is; how it works and what it is capable of achieving.



Among my specialties is analysis of bias in assessments; identification of sources of bias and remediation of any bias that I find. Looking at this problem, I see that it is much like an iceberg. There is a part of it that is visible from the surface - that which can be measured and analyzed. But there is much more below the surface. There is a level of human bias that is ever present in all phases or subsystems of the valuation process. These human biases are in turn often sourced to deeper systemic biases that run through the local real estate market and through society itself. If our desire is to determine if bias exists and root out the causes of bias, all three levels – statistical, human and systemic – must be considered.

I was contacted by the county through members of the Assessment staff that are familiar with my work. They asked if I would perform a *qualified* Equity Study. I have no friends or family in the county. Neither have I any personal or business interests in the county. My function is neither to criticize nor defend the Assessment office, but to provide an objective and dispassionate analysis and produce a set of recommendations that can be implemented. My scope of work includes periodic monitoring of progress which will run through at least the next reappraisal – probably in 2028 or 2029.

5.1 Process

My process in doing this work was to:

- Become familiar with the communities, neighborhoods and property inventory of the county. I spent several days on a driving tour through all 27 communities and many of the neighborhoods, making first hand observations about the properties and conditions throughout the county
- Review the sales and property data
- Review other reports that have been published relating to the assertion of bias in the county's assessments
- Watch hours of video about the history of the county, particularly as it relates to minority residents and communities
- Watch hours of recorded meetings of the AD Hoc reappraisal Committee
- Interview the people who are involved in all aspects of the mass appraisal process
- Examine all subsystems of the mass appraisal practice to identify ways that bias may be entering the mass appraisal process
- Review all existing process documentation and training materials
- Run a series of statistical analyses to examine the health of the assessments and identify bias that exists in the assessments
- Make recommendations for corrective action where needed
- Produce a report of my findings
- Present my findings to county stakeholders and constituents
- Directly answer as many of the constituent's questions as possible

5.2 Appeals

Notably absent from the scope of work is the Appeals Process. Appeals are heard and resolved by a separate Board and are not part of the Mass Appraisal process. Decisions do not necessarily conform to appraisal logic or methods, and are not made with consideration of uniformity. Because the number of appeals is relatively small, their effect on the overall assessment base has minimal impact. None the less, it should be stated that the assessment appeals process tends to be biased towards wealthier constituents with higher value properties. These constituents will interact with government entities; can take time off to attend hearings; can avail themselves of professional representation and often are influential in the community to a degree that can bias the outcome. This is not exclusive to Buncombe County, but has been recognized in jurisdictions of all sizes across the country.

6.0 Goals and Objectives

There is a perception that Buncombe County currently over-assesses the poor and communities of color. In addition, there is also a perception that the county under-assesses wealthy primarily white communities. This report presents a qualified study into the existence of bias in the real property assessments in Buncombe County; identifies sources of bias and makes actionable recommendations for improvement in assessment equity.

6.1 The first objective is to define the problems that we are addressing.

“What is equity?”. The dictionary defines equity as “the quality of being fair and impartial”. This study needs to go a step further. In assessment we consider equity to be a state wherein a group of properties that share a given set of attributes have similar values for tax purposes. Values will not be monolithic, and some variance among similar properties is to be expected. There is no system of mass appraisal that is capable of producing a perfect set of values. Some degree of error is inherent in the process. When viewed from a racial or social perspective, there should be no discernible systemic bias in the valuation process or in the resulting set of appraisals based on race, ethnicity, religion, income, age or any other demographic stratification. The task is to determine if errors are randomly distributed, or if there are patterns in the errors that lead to the over-assessment or under-assessment of demographically identifiable communities.

In assessment, it is easier to discriminate against neighborhoods than individuals. This is not to say that tax policy cannot be implemented that discriminates for or against individuals, but property assessment is principally an exercise in geography.

We should also not assume that all communities of color are poor, that other communities are wealthy, or that all communities of color are disadvantaged. However, if a disadvantaged community can be identified and geographically determined, tests for bias can be applied. Qualified study can be based on any division that can be identified by data and geographically determined.

Our definition of equity is

- That properties that share a given set of attributes have similar values for tax purposes.
- That errors in the estimation of value are randomly distributed, with no patterns in the errors that lead to the overassessment or underassessment of demographically identifiable communities

A distinction needs to be made between equality and equity. With equality everyone gets the same thing. If we seek to correct an imbalance that creates a disadvantage for a certain group equality often does not solve the problem. In fact, it often makes the problem measurably worse. With equity everyone gets what they need so that a common goal can be achieved. An example of a valuation process that creates equality would be using a median value or

value per square foot, perhaps modified by one or more other attributes, to assign values to all properties. By definition, the median value is going to overvalue half of the cases, and undervalue the other half of the cases. It may actually be fair for a very small number of cases, but everyone is treated equally. By contrast, an equitable

valuation process will consider all attributes that effect price and calculate a value for each property based on the (possibly unique) combination of attributes present. Every property could have a different value, but in each case the value would reflect the attributes and market conditions that relate to that specific property. In a revaluation scenario, equality could be that everyone gets a 5% increase in value, regardless of whether they are currently overvalued or undervalued, resulting in even greater disparity. In an equitable revaluation along the same lines, undervalued properties would get an increase; overvalued properties would get a reduction and properties at the correct level of value would get no change.

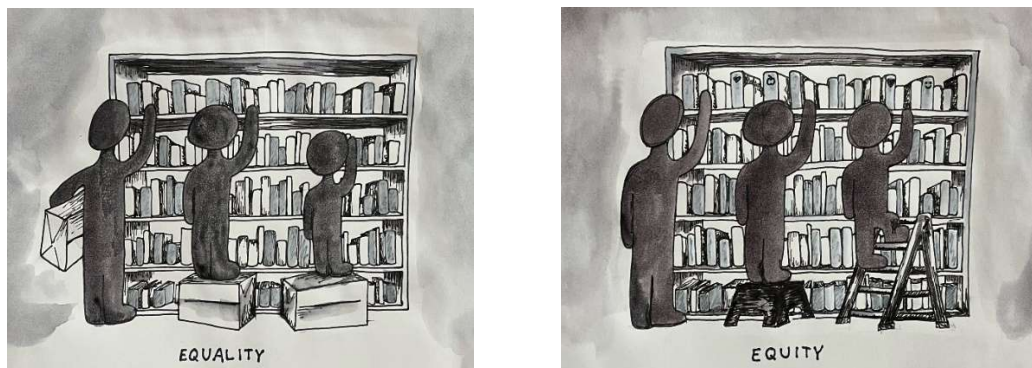


Figure 6.1.1 Equality vs Equity

6.1.1 Systemic vs Anecdotal Bias

There is a difference between observing isolated and unrelated instances of uneven assessment performance, or anecdotal bias, and systemic bias. In order to qualify as systemic, bias must clearly be

- Experienced almost universally
- By a demographically identifiable group

Finding one disadvantaged community that is performing inequitably is not enough to claim systemic bias. Bias against all or many such communities must be demonstrated in order to claim systemic inequity. Bias must be pervasive. Anecdotal bias may be the result of poor or uneven data quality, inadequate training for a small number of employees or the failure to isolate the attributes or forces that create variance in the local real estate market. This is not to say that anecdotal bias should not be remediated when discovered. However, we must recognize that the steps that need to be taken to correct anecdotal bias are different than those that are needed to correct systemic bias, and plan accordingly.

6.1.2 Keep the focus on Assessments

In discussion of this topic there is usually a lot of talk about bias in housing or in the local pricing structures of the real estate market, and assessments get tossed in with all of the other issues. It is easy to conflate assessments with taxes, or to assume that bias in the local pricing structure is causally related with bias in assessments. Are local housing markets subject to bias? If there was a game in a casino that took bets municipality by municipality, I would bet as much as possible on “yes” and probably bankrupt the house in short order. Many real estate markets are segregated by design, with legacies of bias that can be traced back to their foundations. Local pricing structures are frequently linked to demographics, but bias in housing is not the same as bias in assessments. Bias in tax policy is not the same as bias in assessment either.

We may be familiar with the formula:

Property Tax = Assessment * Tax or Millage Rate

In contemporary practice, this classic formula more often takes the form of:

$$\text{Property Tax} = \text{Assessment} * \text{Tax or Millage Rate} + \text{or} - (\text{Abatements; Exemptions and circuit breakers})$$

The assessment office typically has control of only one part of the formula. If assessments are biased, then property taxes will also be biased, but unbiased assessments are not proof against bias in property taxes or bias in the protective relief measures that are enacted as safeguards for taxpayers. Assessment equity is not the same as tax equity. Many studies focus on assessments instead of taxes because assessments are typically public record, but tax bills are not. A challenge is avoiding the distractions of trying to correct the legacies of bias and discrimination in our housing markets and tax policies and stay focused on assessment performance.

Here are some examples to consider.

Redlining is the practice of discriminate lending that exclude neighborhoods that are considered undesirable. Making mortgages unattainable in communities of color or poor communities contributes to the inability of persons in those communities to accumulate wealth. This is the redlining map for the city of Asheville.

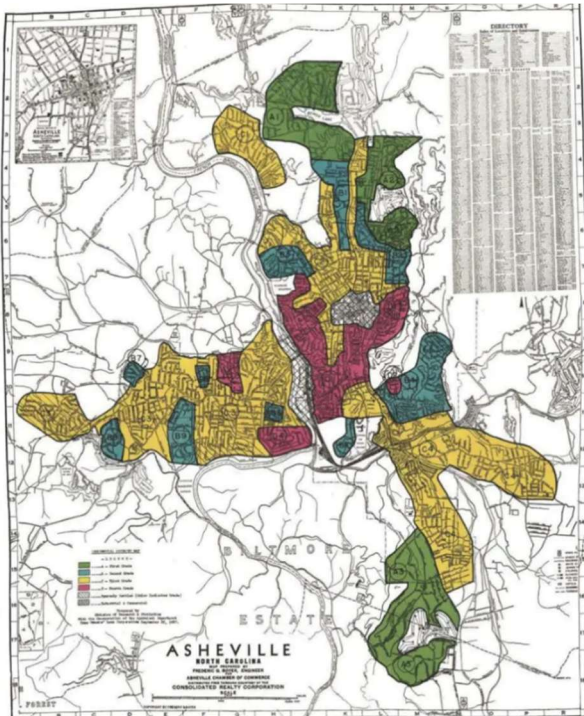


Figure 6.1.2 HOLC Redlining map of Asheville North Carolina

This practice discriminates against communities of color and has a causal effect on keeping prices and values low and inhibiting the growth of generational wealth in those areas. These effects prevent people in those communities from participating in the economic benefits of property ownership.

Predatory speculation occurs when buyers with cash offer people who do not know the true value of their property “easy” money for their homes. It frequently occurs in disadvantaged communities. The speculator’s profit margin is usually a function of how much below market value they are able to acquire the property. The practice is considered to be predatory because it relies on a lack of knowledge on the part of the seller, taking advantage of those who do not have access to market information.

Restrictive covenants are clauses that are written into deeds to prevent the sale or rental of properties to minorities. They are not uncommon in communities across the nation. Racial deed restrictions became common after 1926 when the US Supreme Court validated their use. An owner who violated them risked forfeiture of their property.

Governmental actions have also served to create inequity in housing markets. These actions include using eminent domain to demolish communities of color for public works. This map shows two freeways that were built in Detroit that served to isolate or demolish primarily black owned business districts and entertainment districts.



Figure 6.1.3

Other examples include not building sewers or infrastructure to deliver clean water or adequate waste removal to certain communities.

There have been recent documented cases of bias in the fee appraisal industry. In more than one example a black family has received an appraisal. After removing all evidence, including pictures, artwork etc. of their ownership and getting a white family to stand in for them to meet another appraiser, these same families received higher estimates of value.

What do all of these examples have in common? None of them are about assessments. As assessors we need to stay tightly focused on the issues that involve mass appraisal. Assessors are not typically responsible for the dynamics of the local pricing structure. Assessors do not determine taxes or create tax policy. Assessors do not set tax rates. The assessment function is to estimate market values. At the end of the day, it doesn't matter *why* people pay what they pay for properties, only that the estimates of value are made without favoring one group over another.

6.2 Second Objective Determine the Extent of Bias

The second objective is to determine the extent to which bias, in terms of racial or income demographics, exists in the current assessments. This has been accomplished by running a series of tests and measurements that are standard in the assessment industry, as well as some novel approaches in understanding assessment equity. These tests and measurements form a baseline against which values from the next reassessment can be evaluated to determine the degree to which improvement in assessment performance is realized.

6.3 Third Objective Identify Sources of Bias

The third objective is to identify the sources of bias in the assessments.

This is accomplished by examining the subsystems that are involved in the assessment process as well as the valuation process itself. Through direct observation; interviews with the people that interact with the various systems; examination

of standard workflows, business processes and training documents, each subsystem has been evaluated and possible sources of bias have been identified.

6.4 Fourth Objective Make Recommendations for Improvement

The fourth objective is to make a set of specific and actionable recommendations that will improve assessment equity going forward and to create a process to periodically monitor progress made by the Assessor's office. Recommendations are made throughout this report and also compiled in the summation.

6.5 Fifth Objective Address Published Reports

The fifth objective is to address reports that have been published regarding the equity of assessments in Buncombe County, enumerating flaws and errors in the data sources, methods and conclusions presented in those reports.

7.0 Data Sources

Qualified analysis is not possible without proper data sources. Principal among the mistakes that analysts of assessment bias make is the use of inappropriate data. Use of publicly available sales and property attribute data often invalidate the studies that use them. It is incumbent on the qualified analyst to ensure the data used for any study has been appropriately prepared and screened. Garbage in = garbage out. Knowingly using data that is deficient for the analysis is, in my opinion, unconscionable and reprehensible. To conduct this analysis and produce this report I used only appropriately sourced Sales Data, Parcel Data, Shape files and Demographic Data.

7.1 Sales Data I used a file of recorded transactions, ranging in date from January of 2020 through December of 2023. Rather than use 'raw' publicly available sales data, I specified a file of transactions that had been validated by the Assessment office to include only 'arm's length' transactions and property attributes as of the time of sale. The assessment office created this file in April of 2024 expressly for this purpose. This is the first time that a file of this type has been created. *No other analyst has had a similar resource, which is a serious flaw in any of the reports and analyses that have previously been published.* This does not excuse analysts who present themselves as experts, should know better and could have requested an appropriate data file.

7.2 Parcel Data I used a file of the entire Buncombe County inventory that was extracted from the CAMA system in April of 2024.

7.3 Demographic Data For this study, I used data from the 2022 American Community Survey. I chose aggregates for racial composition and median income by Census Block Group as the best unit of analysis. Data was provided through the ESRI Living Atlas. The Census data does not identify the demographics of any particular property or household, only the aggregates for the entire census block group. *It is not possible to precisely identify the race or income of the owner(s) of any specific property.* The margin of error in the aggregates is also fairly high in many cases. We must also keep in mind that the data is imperfectly collected by the census bureau. For example, if I am Arabic, there is no entry for me on the decennial census form.

7.4 Shape Files Shape files are used to create maps and display data from other sources on those maps. The Assessment office provided the Buncombe County parcel shape file and the Buncombe County recognized communities shapefile. ESRI, the premier source for GIS files, provided the shape files for Census Block Groups; county topography and streets.

8.0 Terms and Definitions

8.1 International Association of Assessing Officers (IAAO)

IAAO is a nonprofit, educational, and research association. It is a professional membership organization of government assessment officials and others interested in the administration of the property tax. IAAO was founded in 1934, and now has a membership of more than 8,000 members worldwide from governmental, business, and academic communities. IAAO publishes and maintains industry standards that are used as guidelines by Assessors around the world.

8.2 Market Value

By North Carolina statute, "true value" shall be interpreted as meaning market value, that is, the price estimated in terms of money at which the property would change hands between a willing and financially able buyer and a willing seller, neither being under any compulsion to buy or to sell and both having reasonable knowledge of all the uses to which the property is adapted and for which it is capable of being used.¹

Fannie Mae defines Market value as "the most probable price that a property should bring in a competitive and open market under all conditions requisite to a fair sale, the buyer and seller, each acting prudently, knowledgeably and assuming the price is not affected by undue stimulus. Implicit in this definition is the consummation of a sale as of a specified date and the passing of title from seller to buyer under conditions whereby:

- buyer and seller are typically motivated;
- both parties are well informed or well advised, and each acting in what they consider to be in their own best interest;
- a reasonable time is allowed for exposure in the open market;
- payment is made in terms of cash in U.S. dollars or in terms of financial arrangements comparable thereto; and
- the price represents the normal consideration for the property sold unaffected by special or creative financing or sales concessions granted by anyone associated with the sale."²

It is important to understand that Price is not the same as Value. In assessment practice, it is commonly understood that Price is a proxy for Value – maybe the best proxy – but only a proxy none the less. Observed price may not conform to the definition of market value if either party is not knowledgeable; under duress; not typically motivated; or if the property is not exposed to an open market for a reasonable period of time. The Principle of Substitution states that a buyer will not pay more for a property than the cost of an equally desirable property. This assumes that equally desirable properties are available. With unique or high-end properties, the lack of supply tends to inflate the price that is ultimately paid. Price becomes biased in favor of the buyer that is willing to pay more than any other competitor, and that price may not be predicated on the attributes of the property and cannot be predicted for another similar property.

There are stakeholders in the county who are recommending simply making the market value of a property equal to the observed sale price. This practice is known in the assessment industry as 'sales chasing' and its use is strongly discouraged. Value is something that must be predictable through a combination of the attributes of the property and normal activity of buyers and sellers in the market. The distortions that are observed in price relative to value are many. Using Price as the ultimate indicator of Value leads to problems in uniformly estimating Value through an objective and repeatable process.

¹ North Carolina General Statutes – Chapter 5 Article 13 105-283

² FNMA Selling Guide Chapter B4-1.1-01 Definition of Market Value

8.3 Assessment Bias

Assessments are biased when there is measurable difference in the aggregate level of assessment or in the measures of vertical or horizontal equity that can be linked to an identifiable group of properties. Groups can be defined by price classes; property attributes – such as location, design, size or age. Groups can also be defined based on demographics – most commonly ethnicity, religion or income level – of the buyer or owner.

8.4 Qualified Sales Data

Transactions that have been reviewed to determine if the transaction is useful as an indicator of the value similar properties. This goes beyond the simple determination of a transaction status as “arms-length”. Sheriff sales, estate sales, sales between related parties, bids, foreclosures, sales to predatory speculators, sales involving atypical financing, sales where either the buyer or seller are under duress or any other transactions that do not represent normal market activity between willing and knowledgeable parties should be disqualified for use in both the valuation process and analysis of assessment equity.

For ratio studies, transactions should capture the attributes of the property at the time of sale. This is specified in section 3.5 of the IAAO Standard on Ratio Studies³, although many analysts do not adhere to this requirement. Transactions where the attributes of the property at the time of valuation are different than the attributes that were present at the time of sale are misleading, as they do not represent the property ‘as purchased’. The price no longer has a relationship with the value of the property, so the commonly used ratio of value to price is not meaningful.

Another important requirement is the adjustment of sale prices over time. This is discussed more completely in Section **12.3 Adjusting sales data for time.**

8.5 Demographic Classes

Use of demographic data is necessary in a meaningful analysis of bias. This can pose problems if the assessment office conducts the analysis. Jurisdictions that are subject to the Uniform Standard of Professional Appraisal Practice (USPAP) are prohibited from using demographic data in appraisal, and the integration of assessment, property or sales data with demographic data is not recommended.

Taking raw census data as scalar or numerical values can generate results that are difficult to interpret. It is useful to transform the data into categories or “buckets” that are easier to interpret. One must also decide if it more appropriate to define strata by absolute or relative terms. Median income and cost of living vary greatly from one municipality to the next. Therefore, it makes more sense to look at median income from a local perspective. Using evenly distributed quintiles based on the median income for Census Block Groups in Buncombe County normalizes the data to fit the local market.

For this study, five “buckets” for income by Census Block Groups were created.

class	IncClassDesc
1	LT \$47,000
2	\$47,000 to \$61,999
3	\$62,000 to \$71,999
4	\$72,000 to \$90,000
5	GT \$90,000

³ IAAO Standard on Ratio Studies April 2013 Section 3.5 https://www.iaao.org/media/standards/Standard_on_Ratio_Studies.pdf

It makes more sense to examine racial composition from an absolute perspective, so the racial divisions will not be evenly distributed, but will conform to a more universal standard.

Five “buckets” were also created for racial composition

class	RaceClassDesc
1	LE 20% Non-White
2	GT 20% to 40% Non-White
3	GT 40% to 70% Non-White
4	GT 70% to 90% Non-White
5	GT 90% Non-White

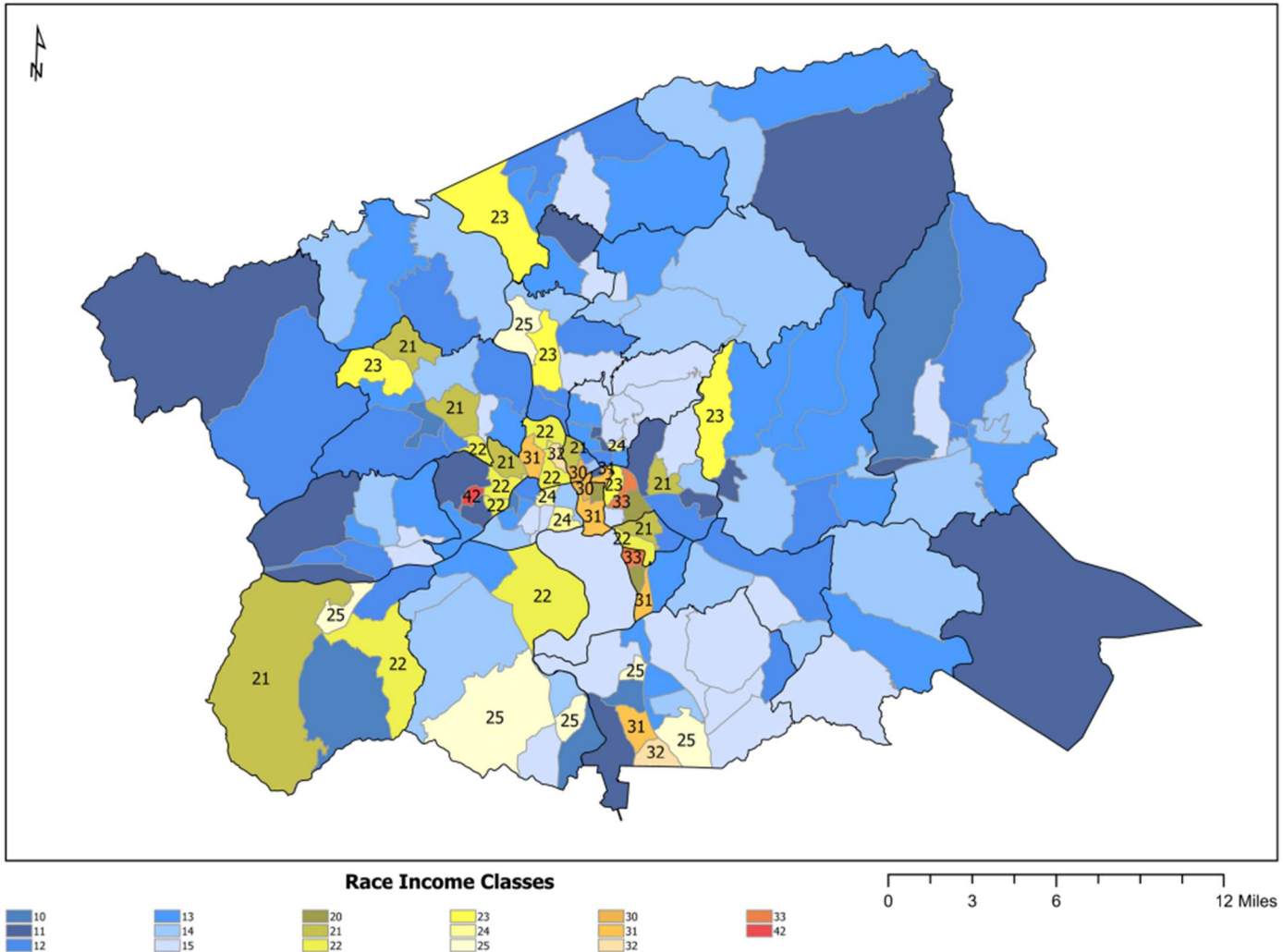
Buncombe County has no census block groups in Race Class 5, and only one in Race Class 4.

Combining each of five categories for race and income, twenty-five “buckets” for every possible combination of race and income were created, ranging from predominately white / low income to predominately non-white / high income.

11	LE 20% Non-White and LT \$47,000
12	LE 20% Non-White and \$47,000 to \$61,999
13	LE 20% Non-White and \$62,000 to \$71,999
14	LE 20% Non-White and \$72,000 to \$90,000
15	LE 20% Non-White and GT \$90,000
21	GT 20% to 40% Non-White and LT \$47,000
22	GT 20% to 40% Non-White and \$47,000 to \$61,999
23	GT 20% to 40% Non-White and \$62,000 to \$71,999
24	GT 20% to 40% Non-White and \$72,000 to \$90,000
25	GT 20% to 40% Non-White and GT \$90,000
31	GT 40% to 70% Non-White and LT \$47,000
32	GT 40% to 70% Non-White and \$47,000 to \$61,999
33	GT 40% to 70% Non-White and \$62,000 to \$71,999
34	GT 40% to 70% Non-White and \$72,000 to \$90,000
35	GT 40% to 70% Non-White and GT \$90,000
41	GT 70% to 90% Non-White and LT \$47,000
42	GT 70% to 90% Non-White and \$47,000 to \$61,999
43	GT 70% to 90% Non-White and \$62,000 to \$71,999
44	GT 70% to 90% Non-White and \$72,000 to \$90,000
45	GT 70% to 90% Non-White and GT \$90,000
51	GT 90% Non-White and LT \$47,000
52	GT 90% Non-White and \$47,000 to \$61,999
53	GT 90% Non-White and \$62,000 to \$71,999
54	GT 90% Non-White and \$72,000 to \$90,000
55	GT 90% Non-White and GT \$90,000

Buncombe County has no census block groups in race/income classes 34, 35, 41, 43, 44, 45, 51, 52, 53, 54, or 55. Only fourteen of the possible twenty-five groups are represented. This map shows the locations of all census block groups that are more than 20% non-white.

Buncombe County Race Income Class



Map 8.5 Census Tract Block Groups by Race and Income

9.0 Overview of the Problem

Before proceeding I want to ensure that everyone understands the problem that the county is facing. Visual aids are very helpful in understanding the problem of bias in assessments. In fact, it is difficult to understand the problem without a visualization. Here is a statement and visual representation of the problem: There is a general perception that property assessments are biased against communities of color and poor people. It is possible that the *perception* – not the underlying truth – is the problem. In the face of a strong perception, the truth of a matter may become irrelevant. Figure 9.1 actually captures Buncombe County’s problem pretty well. Using this diagram as a guide, let’s walk through the elements one by one. Numbered elements in the diagram correspond to the numbered bullet points.

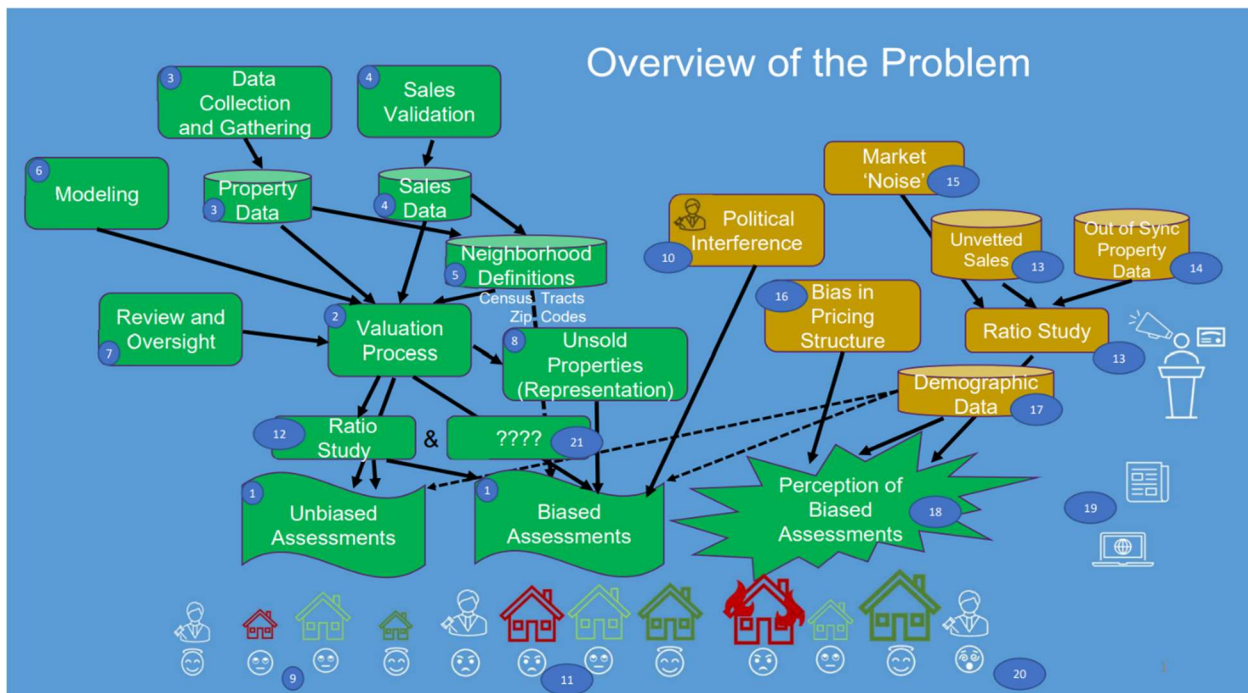


Figure 9.1

Let's start by looking at the valuation process.

1. Assessments can be either biased or unbiased. There are industry benchmarks for the level of assessment and the relative uniformity of assessments. Ideally, predicted market values should closely replicate observed sale prices, with little variation in the degree to which those values are related to price. Assessments are considered to be unbiased if measures of uniformity are consistent throughout the universe of sales data, and residuals (the difference between the predicted price and the observed price – a fancy way to say “errors”) are randomly distributed. Assessments may be considered to be biased if errors are not randomly distributed, or can be correlated with specific locations; low or high prices; or shown to clearly favor one subset of properties over another. It is a practical impossibility to achieve a perfectly distributed set of assessments, however those that fall within recognized industry standards can be considered to be unbiased.
2. Assessments are the result of a valuation process, and there are many different valuation processes. Every county or municipality will create a unique valuation process; however, all valuation processes will have certain elements or subsystems in common. These typically include:
3. Data collection and gathering, which leads to databases of property data
4. Sales validation, which determines which sales are indicators of the value of similar properties and also captures attributes of properties at the time of sale and leads to a database of sales data.
5. Sales and property data may be used to create neighborhood or location definitions. These should not be based on demographic data. Some municipalities use census tracts or zip codes to delineate neighborhoods. If so, the results will almost certainly be biased along demographic lines because zip codes and census tracts are rooted in demographics. Buncombe County uses a custom defined set of location definitions.
6. Modeling is the logic and mathematics that convert sales, income, cost and property data into predictions of value. For purposes of this discussion, a model is any repeatable process that results in a value prediction.
7. Review and oversight, which includes examining the values produced by the model or by the valuation process and making corrections or revisions, as well as resolution of complaints and informal or formal appeals by property owners.

8. The results of the evaluation process are applied to all properties including those that sold as well as those that did not. In Buncombe County typically between 4% and 6% of the properties are sold each year, leaving the vast majority of properties in the unsold properties group. Sales are never evenly distributed, so there may be properties that are not directly represented by sales. This leaves plenty of room for assumptions that may lead to errors. One group of 10 sales might represent a group of 300 properties. Another group of 10 sales might represent 50 properties. The magnitude of errors can be greatly affected by the representative relationship between sold and unsold properties.
9. If assessments are unbiased, the pool of over-assessed properties will be small and randomly distributed, so that many homeowners in this group may not be aware that they are over-assessed. The pool of under-assessed homeowners will also be small and randomly distributed. In my experience many of these homeowners will know that they are under-assessed but will not complain. The large pool of accurately and fairly assessed homeowners will typically go about their lives without any feeling about their property assessments. The municipality will be satisfied because very few people are complaining.
10. Most assessment offices exist within the political framework of the county or municipality and do not operate in a vacuum. If there is direct political interference in the valuation process assessments will necessarily be biased. Political interference may be overt or subtle but can also be benign or well intentioned.
11. If assessments are biased, there will be larger pools above over-assessed and under-assessed properties or homeowners and the effects will not be randomly distributed. There will be clear winners and losers. The winners may be quite happy. The losers will be unhappy. The municipality or county should be unhappy as well.

Now let us consider these subsystems and processes. Each of them is driven by humans, and humans have biases. There are opportunities for bias to be introduced through any of these subsystems, and if even one of them infects the valuation process with bias, then the resulting assessments may also be biased. Every one of these subsystems or processes must be without bias in order for the assessments to be unbiased. Viewed from this perspective, we can easily understand how difficult it is to produce a set of unbiased assessments. The deck is really stacked against the assessment office.

How do we determine if assessments are biased or unbiased? Whether we use the sales approach, cost approach or income approach, the resulting estimates of market value are predictions of a sale price.

12. We typically conduct a ratio study which is a statistical process that compares the level of assessment and uniformity to observed sale prices across neighborhoods, types of buildings, price levels or many other ways to stratify properties. A serious limitation is that ratio studies can only be run against the file of sold properties. They tell us little or nothing about the large pool of unsold properties. Also consider that in most ratio studies each sale carries equal weight, so the degree to which a sale represents a greater or lesser number of unsold properties is not recognized.

Now let's examine how the perception of bias arises.

13. Along comes an outside analyst. They are probably an academic, or perhaps a community activist. They have two things that the assessors' office does not have - credentials and an audience. They are telling the world that assessments are extremely and systemically biased. They came to this conclusion by running a ratio study, just like the assessor's office does. Well, not exactly. You see they do not have access to the same data that the assessors' office has. They are using publicly available data. This includes sales data that has not been vetted to remove transactions that do not meet prescribed tests for being indicators of typical market activity and are not useful predictors of the prices for similar properties.

14. They are also using only current property data - both physical attributes and market values - not data that describes the conditions that were present at the time of sale. For example, the file includes a sale from 2020 for a property in poor condition which sold for \$100,000. The property has been subsequently rehabbed and has a current value of \$200,000. The data file shows that the property is a rehab with a value of \$200,000 and a sale price of \$100,000. From their perspective, it looks like the property is significantly overvalued. In the assessors' data file, the sale price of \$100,000 is for a poor condition property, for which the prediction of value might have been \$102,000. See the problem? The analysis is correct, but the data is flawed.
15. Additionally, this analyst is not familiar with the dynamics of the local housing market and therefore does not recognize the "noise" that is inherent in any market. The entire appraisal industry is predicated on the premise that the value of a property is linked to its attributes; that the value of a property can be predicted if the attributes of the property are known and can be compared to the attributes of similar properties that have sold. If I know the attributes of a property, I can predict a value. Are there cases where prices are not as dependent on attributes as they are on other factors that may not relate to the property at all? What happens when the relationship between price and attributes is broken? When observed prices are not based on the attributes of the property, variance from predictable prices arises which cannot be explained.

Consider how often we see identical properties next door to one another that sell at the same time but at different prices. The difference may be explained by the relative negotiating skills of the buyers and sellers - something that will never be captured in our data files. Sometimes variance in price may be due to the presence of an attribute that is so unique that it is not captured in our data. Even if that attribute were in the data, it would appear so infrequently that it would be statistically insignificant. The relationship between price and attributes tends to breakdown with greater frequency in the low and high-ends of the price spectrum. A greater percentage of sales in the low-end and high-end price ranges should therefore be invalidated in the sales vetting process.

16. This analyst is usually aware of bias in the local housing market – redlining; restrictive deed covenants; predatory speculation; infrastructure problems and others - and assumes that those biases have a causal relationship with assessments.
17. The analyst examines the results of the flawed ratio study by incorporating demographic data into the analysis. Demographic data such as ethnicity, income, age, and levels of education should have no place in the valuation process. Considering that much of the "noise" in the market occurs in communities of color and in poor neighborhoods, cross correlation of ratios with demographic data further distorts the emergent picture. Even so, the assessor's office must be prepared to examine performance through the lenses of demographics if the arguments are to be countered. This can be tricky, as it is easy to confuse correlation with causality.
18. All of this converges to create a strong perception, seemingly based in fact, that assessments are biased.
19. Articles and reports are published and presented to the public.
20. This results in large groups of people who believe that they are subject to unfair treatment by the county or municipality. The municipality is concerned because the very real threat of a class action lawsuit could result in significant loss of revenue. Even worse, the remedy that could be imposed by a court may actually fail to resolve the problem. The cure could be worse than the disease.
21. In addition to conducting ratio studies to examine the health of assessments, there are other meaningful analyses that need to be performed. This is a space where innovation is needed. The assessment industry needs to go beyond analysis of the relationship between sales and market values and consider activity levels; representation of unsold properties; comparative market value rates and other measures of assessment equity and performance. When we engage in the bias discussion, we should ensure that all parties in the discussion are addressing the same issues from

a common perspective. Only then can we identify both the presence of bias in the valuation process and trace any observed bias to its source so it can be remediated.

Only when I made this diagram was I able to see that I was not addressing the correct question. When presented with a report that assessments in Philadelphia were biased, I went directly to all of the elements on the left side of the diagram – the valuation process and subsystems – without considering the most important aspects of the discussion. What was generating the perception of bias? How were qualified analysts coming to a conclusion of bias? I had to identify the elements on the right side of the diagram in order to frame a discussion that had any chance of allowing a rational approach to identifying and resolving the issues.

9.1 Common Problems with Bias Analysis

If we understand the process by which some analysts arrive at a determination of bias, we can see and isolate problems with their approaches and techniques. These are the most common problems with many of these reports.

Sales data that is not appropriate for the analysis: The analyst uses publicly available data. This includes sales data that has not been vetted to remove transactions that do not meet prescribed tests for being indicators of typical market activity and are not useful predictors of the prices for similar properties.

Characteristics data is not representative of the properties at time of sale: The analyst uses only current property data - both physical attributes and market values - not data that describes the conditions that were present at the time of sale.

In these cases, there is no relationship between Price and Value, so no valid conclusions can be drawn about bias or assessment quality.

No significant sales validation: The analyst considers all 'arm's length' transaction as valid, and do not filter out outliers or transactions that do not represent typical market activity.

Imprecise time trending methods: The analyst does not time trend sales, or uses price indexes to adjust prices for time.

Ratio study based on flawed data – market value and sale price not necessarily connected. This violates the IAAO standard for ratio studies.

'Market noise' not recognized or removed from the analysis: The analyst does not understand why distortions in the high and low-price ranges are a natural consequence of mass appraisal, and assume that these are indications of bias.

Representation of unsold properties not considered: The analyst assumes that sales in the ratio study proportionately represent unsold properties, and that assessment performance therefore mirrors performance in the ratio study.

Comparison based on Price or Value: The analyst considers only sale price and value, and does not normalize the data by using significant units of comparison – such as price per square foot or market value per square foot, which can explain some of the observed variance.

These are precisely the problems with reports that have been published regarding assessment Equity in Buncombe County. I have seen similar reports for other jurisdictions. All of these reports share the same critical deficiencies. In my opinion, these deficiencies disqualify these reports as credible analyses.

10.0 Legacy of Practice and Current Practice

In any determination of bias, it is important to examine and understand the legacy of assessment practice. Bias can usually be traced to the foundation of the jurisdiction. Where overt bias is present, it is usually a feature – not a bug. The legacy of over-taxing disadvantaged communities, or under-taxing the wealthy and powerful is so imbedded that the practice continues unchallenged. While it is not anyone's purpose to continue patterns of bias, neither is it anyone's purpose to dismantle these patterns. Modern assessment practice is driven by property data and should operate without regard to demographics. It should be owner-agnostic and result in a 'blind and fair' process. However, neighborhood definitions and the ways that data is collected and managed can be used to imbed bias into the process.

Buncombe County was founded in 1794 by Samuel Ashe. The earliest non-white residents were not property owners, but were more likely themselves property. The first African-American community was in Shiloh. Workers who built or were later employed at the Biltmore Estate were offered land to build homes in Shiloh by George Vanderbilt. One resident famously refused to move, and did not relocate to Shiloh.

Shiloh thus became the first of what became known as 'Legacy Neighborhoods' where African-Americans were concentrated. African-Americans serviced many of the resorts that sprung up in Asheville, and Southside; Sweeten Creek; Leicester; and parts of North Asheville; Northwest Asheville; and East Asheville become other 'Legacy Neighborhoods'. Most of these neighborhoods have been gentrified or dismantled to accommodate infrastructure projects as the county has modernized. During the 1960's many non-white owners and renters were relocated into city or county owned housing projects. Today, there are only 8 neighborhoods where the population is more than 40% non-white. Shiloh/Sweeten Creek is the last remaining 'Legacy Neighborhood' that is more than 40% non-white. These are the communities in which we focus our inquiry of bias based on race and the combination of race and income.

Modern assessment practice became possible with the advent of computers. The Cost Approach was adapted from the Insurance industry used to estimate values for properties. Early Computer Aided Mass Appraisal (CAMA) systems were designed to accommodate the cost approach. Sales and Income approaches that were commonly used in the Fee Appraisal industry were later adapted for use in Mass Appraisal. The Mass Appraisal industry has been revolutionized in the past few years, as advances in imagery, computing power, data collection and storage put more power at lower cost into the hands of the Assessor. Yet, in many offices, the vestiges of the pen-and-paper assessment practice have determined the direction and limits to which modern mass appraisal is conducted. Currently the vast majority of Assessment offices still use the cost approach to mass appraise residential properties, even though IAAO recommends use of the sales approach for this class of properties. Many offices do not have the required data quality, volume of sales or model building skill to transition to the Sales approach. Cutting edge software cannot overcome old thought paradigms, or legacies of overt bias that may be deeply imbedded in the policies, practices and procedures of the Assessment office. For these reasons, it was necessary for me to evaluate the skill and technical capacity of the Buncombe County office, as well to determine if there were overt biases in the valuation process. This was accomplished through observation, interviews, and review of workflows and training.

10.01 Current Environment

The current environment features:

- a modern CAMA system that is capable of storing data elements that are needed for mass appraisal.
- the best available aerial and street level imagery, with the capacity to integrate self-generated images into the system.

- a state-of-the-art Geographic Information System (GIS), with specialists who have the skill to take full advantage of that system.
- Change detection software that can identify properties that have built additions or made substantial changes.
- A contractor that uses the change detection program to update building sketches and measurements in the CAMA system.
- A paperless permitting system that integrates with the CAMA system.
- An 'AI' model that is run periodically to estimate values. This model is not used for production purposes, but to identify possible data errors and to validate land values and neighborhood adjustments.
- A CAMA add-on system that can find comparable properties and sales for specific properties. This is primarily used for customer inquiries, and answering complaints and appeals. This system can also be used to implement regression models, although it is not ideal for the development and iterative testing and specification of those models.

The office was recognized by the IAAO in 2019 with the coveted Certificate of Excellence in Assessment Administration, one of seven counties in North Carolina to ever receive the award. Even so, the office is very progressive and dedicated to improving the practice of Mass Appraisal in the county.

Review of data, systems and processes confirmed that the office has no imbedded demographic considerations in their work.

- The way that they define neighborhoods is objective and based on data and property attributes.
- They do not rely on vestiges of legacy practice that would generate bias.
- I saw no evidence of overt political interference that favors specific neighborhoods or demographic groups.
- They do not know who owns any given property, so have no way of producing favorable or unfavorable outcomes for specific groups of people.

In essence they adhere to a 'blind and fair' process that produces objective results.

10.02 Transparency

The Assessor's office puts a lot of effort into community outreach and promoting transparency.

- They have a community liaison, whose focus is on meeting with constituents and taking the Assessor's message into the communities that do not typically trust or interact with County government
- They participate in meetings and events in many communities to listen to constituents and address their questions and concerns
- They have public facing resources that make information about properties and assessments readily available
- They work with the county's communication office to produce videos, informational resources using local radio and television and educational resources to promote understanding and transparency
- They have an Ad Hoc Reappraisal committee whose mandate is to identify citizen concerns; provide guidance on future assessments and provide input into equity concerns⁴ This committee was formed in November of 2021 and has been intimately involved with the execution of the 2025 reappraisal.
- They have mailed out over 80,000 postcards, giving homeowners and opportunity to review data about their property and self-correct to improve data quality and assessment accuracy. Over 23,000 of these have been returned, resulting in over 8,000 updates to the property databases.

In terms of modernizing and running an effective assessment office, Buncombe County has done an outstanding job, and is doing just about everything the right way. They adhere to the IAAO standards and guidelines in many degrees, and aspire to follow those with which they are not yet in compliance.

10.03 2025 Reappraisal

There is a reappraisal in process for 2025. The last reappraisal in 2021 achieved very good results by IAAO standards. The office has made numerous improvements and expects to produce even better results in the upcoming effort. They have focused on:

- Improving data quality and completeness
- Updating depreciation methods to improve accuracy
- Improving assignment of Building Quality and Condition grades

- A new Land Value methodology
- Improving Building Size adjustments

The staff of the Buncombe County office is highly skilled, with exceptionally talented people in key positions throughout the department. Those that I observed, met with and interviewed are dedicated to the highest standards of excellence in public service. They understand the requirements and nuances of the work, and are motivated to make improvements in any and all areas that will create more accurate and fair assessments for their constituents.

In recognition of the difficulties in the valuation of high-end properties, they have created a specialty position for a Luxury Home specialist. They have also created a Data Review Specialist position and a Data Analysis Team. These assignments should improve data quality.

The office has expressed the desire to use regression models for the valuation of residential properties. This means that they need to create a team of at least three people to build, test and implement a catalog of models. The same team could eventually build a catalog of income models for non-residential properties.

10.04 Staffing

Despite all of these positive observations, an unavoidable truth is that the Assessment Office is critically understaffed. IAAO recommends a parcel to staff ratio of between 2000:1 and 5000:1, depending on how homogenous the inventory; the level of technology and the number of accounts in non-residential property classes. With 133,000 parcels, the office should have between 26 and 66 employees. The Real Property division currently has 25 on staff, with one vacant position in their workforce plan. This number includes the Real Property Appraisers; Analysts; GIS staff and Administrative personnel, but does not include 4 contract workers who provide general services not directly related to appraisal. The ratio of accounts to staff is approximately 5300:1. The high degree of technological capacity provides efficiencies that reduce the total number of recommended staff, but this is countered by the variety and complexity of the inventory and the number of sub-markets. It is not within the scope of this report to make specific recommendations regarding the optimal number of staff or to address the organization of the office, however it is safe to recommend increasing the number of staff in the Real Property Division. The Assessment office and the County managers should work to arrive at a workforce plan that will realistically provide the Assessment office with the capacity to best serve constituents. County managers are encouraged to consider staff augmentation, not as an expense, but as an investment in constituent services that pays significant dividends in both the short and long term.

Recommendation: Increase the number of permanent appraisal staff to comply with IAAO guidelines.

The County should consider workforce augmentation using interns to provide lower level, less technical services. Other jurisdictions work with local universities to provide interns to assist with Sales Validation; and Data Collection, Data

Validation and Data Quality Control. This can both reduce costs and provide greater flexibility for the county. Students are eager to augment their resumes, and internships can provide paths to permanent higher-level employment.

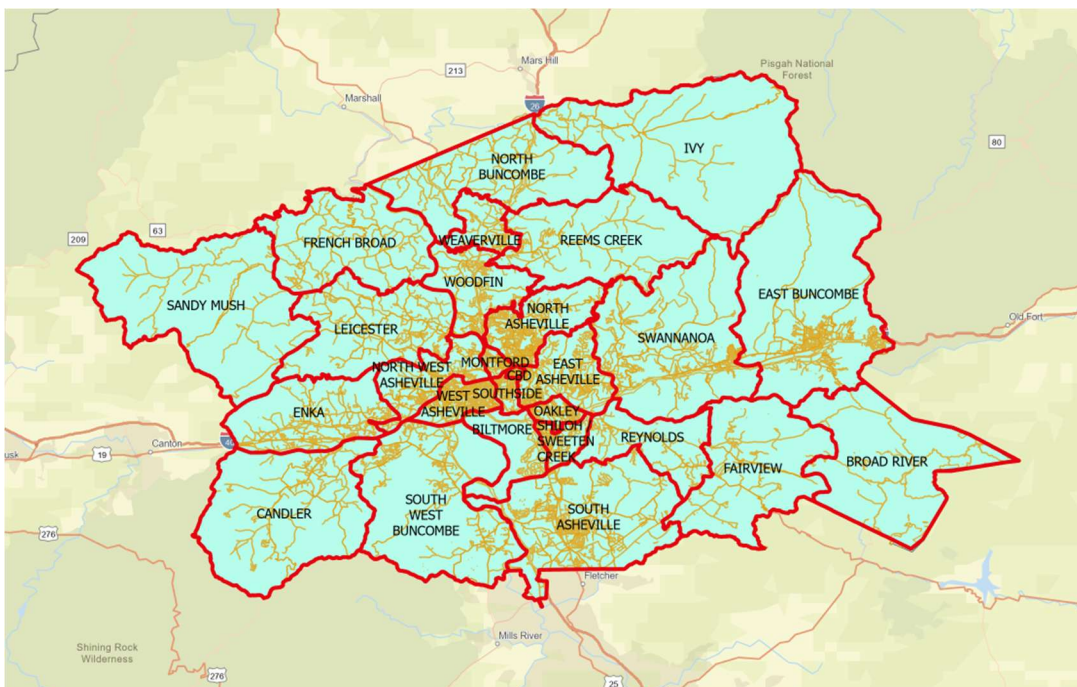
Recommendation: Create a Customer Unit to handle complaints and inquiries. Currently there is one person assigned to customer service. This person answers phone call, greets the public at the office and assists with general tasks. Inquiries, complaints and appeals fall to the assigned appraiser and take an unpredictable amount of time away from other work. It is generally more efficient to assign this function to lower-level employees as a specialty. I recommend adding two staff members specifically for this purpose. These people do not need to have the extensive experience of the Appraisers, and could be hired from outside of the Department.

Recommendation: Create a three-person Modeling and Analysis Unit. These positions require extensive domain knowledge and Mass Appraisal expertise. It is very difficult to find these people as external hires. I recommend training and elevating current employees and 'backfilling' the positions from which they came. These positions will need to be added to the workforce plan with appropriate pay scales and job titles and descriptions.

Recommendation: Create a specialty for manufactured homes, modular homes and unusual properties. Like the luxury homes, these properties require special attention.

Recommendation: Partner with local universities to create an internship program to augment the appraisal staff.

11.0 Overview of the County



Map 11.0 Overview of Buncombe County

Population (2022): 273,589

Number of parcels (2024): 133,000

Households (2022): 103,428

Housing Units (2020): 129,141

Median income (2022): \$68,019

Employment Rate (2022): 57.6%

Employer Establishments (2021): 9,401

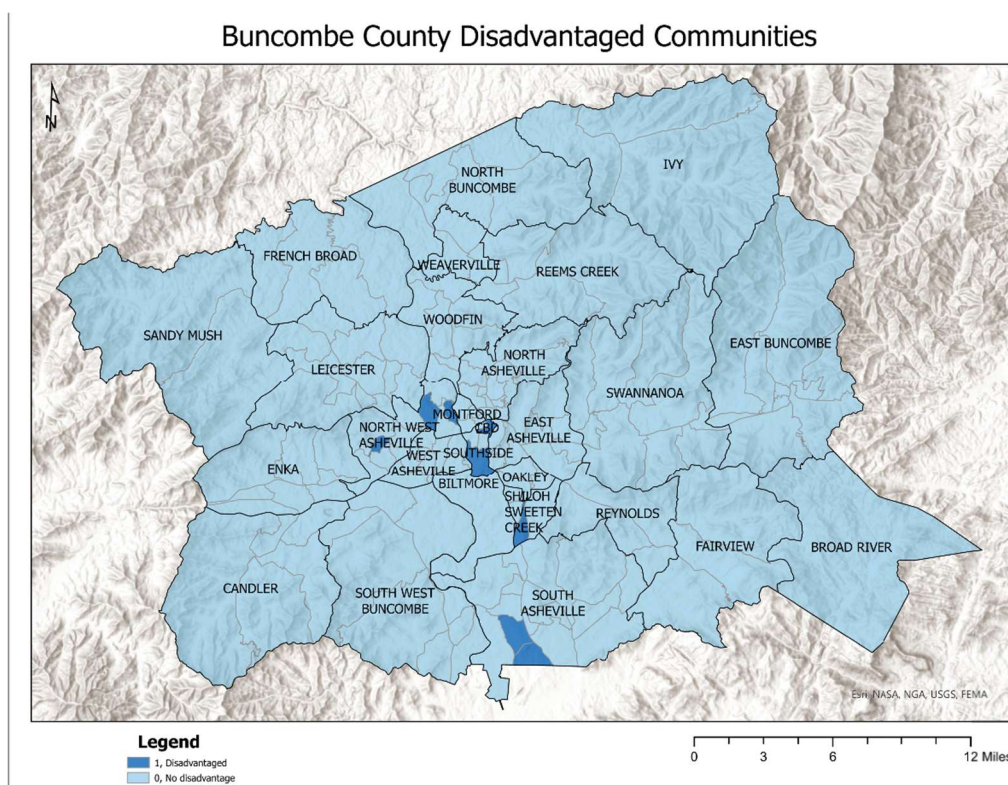
Education – Bachelor's or Higher (2022): 46%

Race and Ethnicity (2022): White – 82.2%; African American – 5.1%; Other – 12.7%

11.1 Communities and Neighborhoods

There are twenty-seven commonly referenced and recognized communities in Buncombe County.

The county is composed of 168 Census Block Groups. Of these, only eight have populations that are more than 40% non-white and in income groups below the median income. I will refer to these as disadvantaged communities throughout this report.



Map 11.1 Disadvantaged Communities

The Assessor's office uses a system of over 2,600 custom-defined neighborhoods to determine locations for Mass Appraisal. These are primarily used to determine land values and are discussed more fully in the sub-system analysis for Neighborhoods (section 15.3). A contractor has used clustering to identify about 900 neighborhoods. This is still probably too many to provide representation for many properties. While the number of neighborhoods must be arrived at through a defined process, the most effective number would probably be between 250 and 350.

11.2 Markets and Sub-Markets

The real estate market in Buncombe County is not homogenous or uniform. It is actually made up of several sub-markets. Each sub-market will be subject to its own time trend; present different attributes that have significant contributory

importance; have different locational influences and present different data collection and data quality issues. One of the dangers in mass appraisal is to assume that activity in one sub-market is representative of another sub-market. Calibrating a mass appraisal program to address performance in one sub-market can lead to degradation of performance in others. Effective mass appraisal must tailor different approaches and solutions for different sub-markets.

Buncombe County has several identifiable sub-markets, as well as others that have yet to be identified.

While this analysis and report are focused on the single-family residential market, these are other sub-markets that have been identified.

Commercial – which includes the Office building, Retail and Apartment building markets, each of which has its own submarkets. An emerging trend in the market is the proliferation of large multi-purpose buildings. These do not appear to have gained enough popularity in Buncombe County to require an approach that is tailored for them at this time, but we should anticipate that they will gain in popularity and plan accordingly.

Industrial - which includes manufacturing plants, warehouses, and distribution centers

Condominiums – even though these are residences, ownership is usually a unit and an undivided portion of the entire property (common areas). The land component is treated differently; the significance of certain attributes is much different and the market is much more fluid than in single family residences.

Small multi-family – which includes 2 -4-unit buildings and duplexes

This report is limited to the study and analysis of single-family residential properties. The single-family residential market includes:

Urban, Suburban and Rural sub-markets. These are identified as 27 recognized communities that are made up of 168 Census Block Groups. The communities have been classified as Rural, Urban or Suburban by the Assessor's office. These communities present a great deal of variation within them. For example, all of East Buncombe is not Rural, as it includes the town of Black Rock. A more granular approach to classification of sub-markets as Rural, Suburban or Urban based on Census Block Groups would be more effective.

Recommendation: Make the classification of Rural, Suburban or Urban based on Census Block Groups instead of Communities

Recommendation: Identify Entry Level, Discretionary and Externally Driven sub-markets.

Entry Level would be first-time home buyers and would mostly include the lower price classes, manufactured housing and affordable housing. Buyers in this sub-market are facing some compulsion to act, as prices and rents are rising faster than wages for many people. There is an undersupply of available properties in this sub-market, which will tend to drive prices up.

The Discretionary sub-market includes buyers and sellers who are looking to upgrade or downsize their homes. They would not be under any particular compulsion to act, and may defer buying or selling until interest rates drop, a new sub-division or a very desirable property comes online, or there is some other development in the market.

The External Market includes buyers who have sold homes in other (typically more expensive) markets, such as New York, San Francisco or Seattle, or have experienced a ‘windfall’ event and have a considerable amount of cash with which to buy a property. They are not subject to the economic profile or limitations of existing Buncombe County residents and will readily spend more than can be predicted for properties. They will mostly buy in the Luxury market. There is an undersupply of these properties. Vacant lots are still available in many neighborhoods, and many of these buyers will build new houses. In my opinion, this market is primed for explosive growth. As of this writing, the highest price recorded for a validated sale is \$7.7 million. There are a number of properties currently on the market for higher asking prices, and some sales recorded at higher prices have been invalidated as not representing typical market activity. Overall, there is not much range in price from the lowest to the highest price property and we should expect upward expansion in prices due to the pressures of supply and demand. Someone who sells a modest apartment in Manhattan can buy the most expensive property in Asheville.

Recommendation: Identify out-of-county buyers for purposes of sales validation.

Property type Sub-Markets

The Assessor’s office recognizes some sub-markets that are based on specific types of buildings. These include Manufactured Homes; Log Structures; Rondettes; Seasonal Cottages and Luxury Homes.

Recommendation: Create a specialty role or unit for the valuation of Luxury homes. *The assessor’s office has already recognized this problem and created this role.* Resources should be allocated for a complete data collection and validation project for these properties. This will go a long way toward addressing the under-valuation of high-end properties.

Recommendation: Create a specialty role or unit for the valuation of Manufactured homes.

Markets or neighborhoods should not be defined by Census Tracts, Zip Codes or Voting districts. These are based on demographics and using them to define locations for mass appraisal introduces demographic bias into the process. In Buncombe County, neighborhoods are defined by a custom process, but because the county has many features – such as mountains, rivers, and interstate highways - that create the census block group boundaries, there is a lot of ‘natural’ correlation between neighborhoods and census block groups. There are many custom-defined neighborhoods whose boundaries include multiple census block groups, and most census block groups are composed of multiple neighborhoods. Therefore, correlation between neighborhoods and census block groups does not present the problems that it would in many other jurisdictions.

12.0 Assessment Performance

Measurement of assessment performance required running a highly detailed diagnostic ratio study; a representation study and an analysis of disqualified sales.

Ratio studies are commonly used to examine relationships between prices and assessed values. They are necessary and useful, but should not be exclusively relied upon. The vast majority of assessed properties have not been recently sold, so there is a presumption that the properties that have sold are indicative of the values of the large pool of unsold properties. This presumption must be tested. Every market has areas or groups of properties for which it is difficult to predict price or value because observed prices are not based on the attributes of the properties, but on other market dynamics. Ratio studies can be misleading for these groups of properties. Comparisons of market values may be more

informative. A representation study was run to determine the extent to which properties that sold represent the unsold properties.

Traditional bias analysis relies on a sales ratio study that – for this purpose - is measured in terms, of or overlaid against, demographic data and exposes racial or social bias in assessments. The assessment office does not use demographic data in the valuation process, and does not store any data related to who owns a property, other than the name of the owner(s) as required to maintain public records. To conduct this analysis, I integrated data from the Census Bureau's 2022 American Community Survey.

12.1 Ratio Studies

A Ratio Study is a statistical process that compares sales prices to assessed market values. Ratio studies are commonly used to evaluate the health of assessments. Most jurisdictions report one combined ratio statistic for the entire county. This is common for the purpose of oversight, but for diagnostic purposes, much greater depth and detail is needed. Stratifying the inventory by submarkets or key attributes as well as examining change in ratios over time, or at different points in time, can inform us as to where the county is doing well, where the county is not doing well and can suggest necessary changes to business processes or valuation process(es). For example, if the study shows that the county is consistently doing poorly in the manufactured home submarket, then we can conclude that there is something wrong in the approach to that submarket and that course correction is needed.

For each observation, market value is divided by sale price to calculate the ratio. The resulting ratios are analyzed to calculate the median ratio, the mean ratio and the weighted mean ratio. Of these, the median ratio is typically used to describe the overall level of assessment. The mean and weighted mean are indicators of the presence of extremely high or low ratios, and are compared to the median ratio to determine the degree of distortion or variance from the median ratio. In most jurisdictions, median ratios should be close to 1.00 – which indicates that price and value are equal. The IAAO standard for level of assessment is the median ratio for all classes of property should be between .9 and 1.1. It is of greater importance that median ratios for the inventory when stratified – by location, price class, property type or (for this study) race or income – should be reasonably uniform. If the median ratio for the county is .91, all strata should have median ratios close to .91.

Ratios are also analyzed to both vertical and horizontal equity. All properties that sell for the same price should have close to the same assessed value. This is called horizontal equity and is usually measured by the Coefficient of Dispersion (COD), which is the average percentage of deviation from the median ratio. Lower scores are generally better. Desirable levels vary depending on the homogeneity of the inventory. For Buncombe County, the target COD is less than .20.

Properties in all price ranges or categories should be assessed at the same level. This is called vertical equity and is typically measured by the Price Related Differential (PRD) or the Price Related Bias (PRB). PRD scores between .98 and 1.03 are considered to indicate no bias. Higher or lower scores do not necessarily indicate bias, but suggest that further study is need. PRB coefficients below -.05 or greater than .05 can be viewed with concern. ²

Table 1-3. Ratio Study Uniformity Standards indicating acceptable general quality*

Type of property—General	Type of property—Specific	COD Range**
Single-family residential (including residential condominiums)	Newer or more homogeneous areas	5.0 to 10.0
Single-family residential	Older or more heterogeneous areas	5.0 to 15.0
Other residential	Rural, seasonal, recreational, manufactured housing, 2–4 unit family housing	5.0 to 20.0
Income-producing properties	Larger areas represented by large samples	5.0 to 15.0
Income-producing properties	Smaller areas represented by smaller samples	5.0 to 20.0
Vacant land		5.0 to 25.0
Other real and personal property		Varies with local conditions

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

** Appraisal level for each type of property shown should be between 0.90 and 1.10, unless stricter local standards are required.*

PRD's for each type of property should be between 0.98 and 1.03 to demonstrate vertical equity.

PRD standards are not absolute and may be less meaningful when samples are small or when wide variation in prices exist. In such cases, statistical tests of vertical equity hypotheses should be substituted (see table 1-2).

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

Figure 12.1 IAAO ratio uniformity standards⁴

When the ratio study is stratified, the median ratio and COD are significant for comparing a stratum or submarket to other strata or submarkets. The PRD and PRB are less informative, as they only measure vertical equity *within* the stratum. Looking at the PRD or PRB for a community only tells us about high vs low valued properties within that community, not when compared to other communities. Therefore, the only significant measure of PRD or PRB is at the county level.

12.2 Disqualifying Transactions

Even if the sales approach is not the primary driver of the valuation process, sales will be used to measure assessment performance. When a property's attributes at the time of sale are principally the same as at the time of valuation, there is a relationship between sale price and market value. When the attributes at time of sale and the attributes at time of valuation are significantly different, that relationship no longer holds true. The sale price may bear little or no relationship to the value. If we are using a ratio study as part of the equity analysis, these transactions must be identified and removed from consideration. Section 3.5 of the Standard on Ratio Studies states:

"The appraiser must ascertain whether the property rights transferred, the permitted use, and the physical characteristics of the property on the date of assessment are the same as those on the date of sale. If the physical characteristics of the property have changed since the last appraisal, adjustments may be necessary before including the property in a ratio study. Properties with significant differences in these factors should be excluded from the ratio study."³ It must be emphasized that these sales are disqualified *only* for ratio studies. Because the attributes are matched with the sales prices, they are fine to use for modeling or valuation and representation studies. It is the comparison to *market values* when the attributes have changed that breaks the relationship between attributes and price.

This requires data files that allow the analyst to make this distinction.

Ratio studies are easily distorted by including transactions where the attributes of the property at the time of valuation are different than the attributes that were present at the time of sale.

⁴ IAAO Standard on Ratio Studies April 2013 https://www.iaao.org/media/standards/Standard_on_Ratio_Studies.pdf

Group	Mean	Median	Weighted Mean	Minimum	Maximum	Price Related Differential	Coefficient of Dispersion
A	.945	.927	.933	.086	3.145	1.012	.180
B	.914	.879	.887	.419	5.750	1.031	.207
C	1.006	.997	1.001	.670	2.126	1.005	.066
D	.997	.990	.990	.770	1.637	1.008	.078
E	.998	.982	.985	.547	2.107	1.013	.102
F	1.003	.985	.990	.438	2.148	1.013	.127
G	.974	.947	.923	.106	5.388	1.055	.175
H	.905	.844	.769	.213	6.258	1.177	.280
J	.995	.979	.979	.531	2.278	1.017	.108
K	.978	.958	.968	.498	2.911	1.010	.134
L	1.004	.988	.989	.616	4.245	1.015	.112
M	.992	.973	.981	.242	5.783	1.011	.125
N	.997	.988	.988	.626	2.032	1.010	.074
P	.995	.985	.980	.620	2.110	1.015	.096
Q	.977	.970	.961	.670	1.815	1.017	.087
S	.996	.987	.985	.650	3.600	1.011	.095
Overall	.985	.976	.971	.086	6.258	1.015	.119

Group	Mean	Median	Weighted Mean	Minimum	Maximum	Price Related Differential	Coefficient of Dispersion
A	1.172	.973	1.024	.086	8.186	1.145	.383
B	1.118	.926	.965	.128	6.277	1.159	.406
C	1.010	.998	1.003	.520	2.146	1.007	.073
D	1.010	.992	.997	.679	2.892	1.013	.091
E	1.031	.988	1.000	.474	3.073	1.031	.137
F	1.077	1.007	1.019	.416	3.910	1.057	.196
G	1.204	1.006	1.011	.106	7.966	1.191	.379
H	1.216	.929	.882	.024	11.729	1.379	.559
J	1.042	.987	1.001	.284	3.393	1.041	.156
K	1.109	.979	1.019	.001	7.004	1.088	.270
L	1.157	1.008	1.048	.384	9.382	1.105	.261
M	1.124	.997	1.031	.242	5.783	1.090	.245
N	1.024	.991	1.001	.626	2.405	1.022	.099
P	1.029	.988	.995	.606	3.575	1.033	.131
Q	1.050	.980	1.004	.670	3.157	1.046	.156
S	1.059	.994	1.013	.262	4.159	1.046	.159
Overall	1.083	.990	1.004	.001	11.729	1.078	.216

Figure 12.2 Impact of properly disqualifying transactions

These ratio study results use the same sales data file. The ONLY difference between the two is that transactions where the attributes of the property at the time of valuation are different than the attributes that were present at the time of sale have been removed from the results on the left, but not from the results on the right. Using the results on the right, an analyst could easily conclude that over-assessment is common and that both horizontal and vertical equity are poor. This demonstrates why it is so important to use a properly screened and validated data source when conducting analysis of assessment performance, and why it is strongly recommended that a well validated file of transactions that meet these criteria is created and used to evaluate assessment performance. The difference is not trivial. It is not unusual to disqualify around 40% of the transactions through this process. In qualifying sales for the study used in this report, 42.8% of the transactions were disqualified. If almost half of the data used for a study is flawed, one is bound to get misleading results!

To qualify /disqualify transactions, I compared neighborhood, property type, condition of improvements, quality of construction, size category and building square footage at time of sale to those same attributes at time of valuation, disqualifying those where any of these attributes were different. Minor changes to a property would not disqualify a transaction.

Critics who are unfamiliar with, or choose not to adhere to the IAAO Standard, will say that too many sales are removed. This is not a subjective process, and there is no target number of sales to remove. Disqualification is not determined by a person. The disqualifiers are in the data. *This is the way it is supposed to be done!*

Previous studies used publicly available sales data that were not validated and did not capture attributes as of the date of sale. Therefore, transactions where the attributes of the property at the time of valuation were different than the attributes that were present at the time of sale were not removed from those ratio studies. We can be sure of this because the Assessor's office created the file that meets this standard in preparation for this study – it has not existed before this.

Recommendation: Only use sales data that has been validated and where the attributes of the property at the time of valuation are the same as the attributes that were present at the time of sale for ratio studies. The Assessor's office now keeps this kind of file in the Analysis database and has incorporated capture of attributes at time of sale as into the Sales Validation workflow.

Disqualification Rates

Understanding how rates of disqualification vary across submarkets yields valuable insights into the behavior of the residential market in Buncombe County. *Unqualified analysts often assume that disqualification rates should be constant*

throughout the inventory. This is hardly ever the case in ‘real’ markets. The tables that follow show breakdowns on disqualified transactions by Development Class; Price Class; Disadvantaged Communities; and Race and Income Class. Some analysts point to variance in disqualification rates by race or income as evidence of bias. This study shows that there is variance in disqualification rates no matter *how* the data is stratified and that disqualification rates are not a reliable indicator of bias.

Column ‘0’ are the qualified sales. Column ‘1’ are the sales that were disqualified because attributes of the property at the time of valuation were different than the attributes that were present at the time of sale. Column ‘2’ are the sales that were disqualified as outliers. Outliers are considered to represent atypical market activity. Outlier removal is explained in section **12.4 Outlier Removal**.

More detail is available in Disqualification Study appendix.

Disqualifications by Development Class			Disqualify			Total
			0	1	2	
DevClass	Rural	Count	677	505	88	1270
		% within DevClass	53.3%	39.8%	6.9%	100.0%
	Suburban	Count	6628	5409	759	12796
		% within DevClass	51.8%	42.3%	5.9%	100.0%
	Urban	Count	1068	615	99	1782
		% within DevClass	59.9%	34.5%	5.6%	100.0%
	Count		8373	6529	946	15848
	% within DevClass		52.8%	41.2%	6.0%	100.0%

Figure 12.2.1

This table shows sales in Urban communities have the highest rates of transaction retention, indicating fewer properties are modified after the sale. Urban and Suburban communities tend to have more homogenous inventory, which accounts for a (slightly) lower percentage of outliers.

Looking at disqualifications by price classes reveals a pattern. Notice how the attribute disqualification rate increases as price class increases, ranging from a low of 13.5% in the lowest price class to a high of 67% in the highest price class. This is because entry level buyers tend to buy as much house as they can afford. They may struggle to meet the monthly obligations of mortgage, insurance, utilities, maintenance and taxes. They typically do not have money left over after settling on the property to make costly alterations or improvements to the property, but will live in it as it is at the time of purchase. Buyers in the higher price ranges are more likely to have the capacity to modify the residence to suit their particular tastes and needs. In the highest price range, most owners will make significant alterations or improvements.

Also notice how much atypical market activity takes place in the lowest and highest price classes as evidenced by the rates of outlier disqualification. This is partially due to the way that sales validation is practiced in the assessor’s office, where most transactions are validated *prima facie* (on the face of the transfer document) using the ‘arm’s length’ standard. Very few transactions are invalidated as atypical market activity. This is discussed in more detail in section **15.1 Sales Validation**.

Disqualifications by Price Class

Disqualifications by Price Class			0	Disqualify 1	2	
Price Class	Below 230k	Count	1012	208	325	1545
		% within Price Class	65.5%	13.5%	21.0%	100.0%
	230k to 275k	Count	967	336	73	1376
		% within Price Class	70.3%	24.4%	5.3%	100.0%
	275k to 315k	Count	1086	415	54	1555
		% within Price Class	69.8%	26.7%	3.5%	100.0%
	315k to 350k	Count	1029	516	41	1586
		% within Price Class	64.9%	32.5%	2.6%	100.0%
	350k to 400k	Count	1093	779	42	1914
		% within Price Class	57.1%	40.7%	2.2%	100.0%
	400k to 450k	Count	899	738	35	1672
		% within Price Class	53.8%	44.1%	2.1%	100.0%
	450k to 520k	Count	705	721	42	1468
		% within Price Class	48.0%	49.1%	2.9%	100.0%
	520k to 625k	Count	700	885	73	1658
		% within Price Class	42.2%	53.4%	4.4%	100.0%
	625k to 815k	Count	575	926	74	1575
		% within Price Class	36.5%	58.8%	4.7%	100.0%
	815k+	Count	307	1005	187	1499
		% within Price Class	20.5%	67.0%	12.5%	100.0%
Total		Count	8373	6529	946	15848
		% within Price Class	52.8%	41.2%	6.0%	100.0%

Figure 12.2.2

This table shows how the attribute disqualification rate increases as price class increases, and how much more atypical market activity – as indicated by outliers removed - takes place in the lowest and highest price classes.

This stacked bar chart visually represents the same information

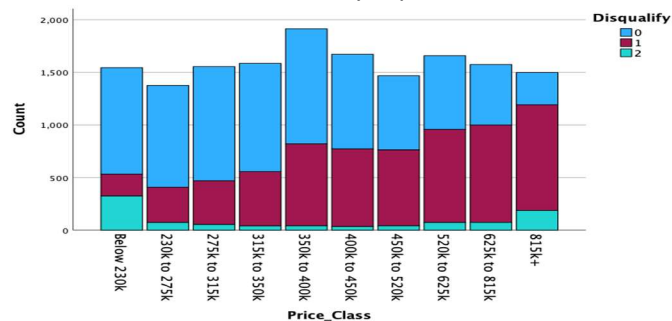
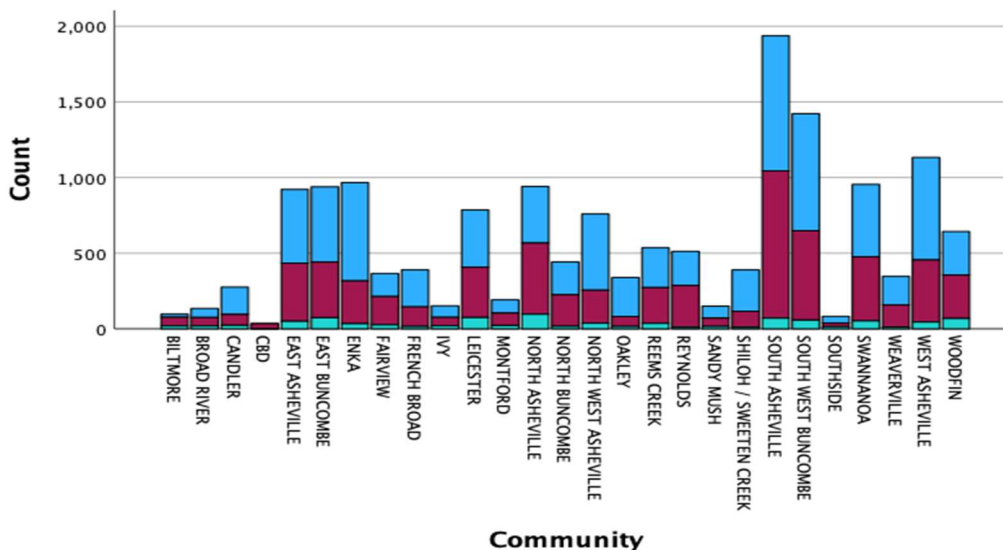


Figure 12.2.3

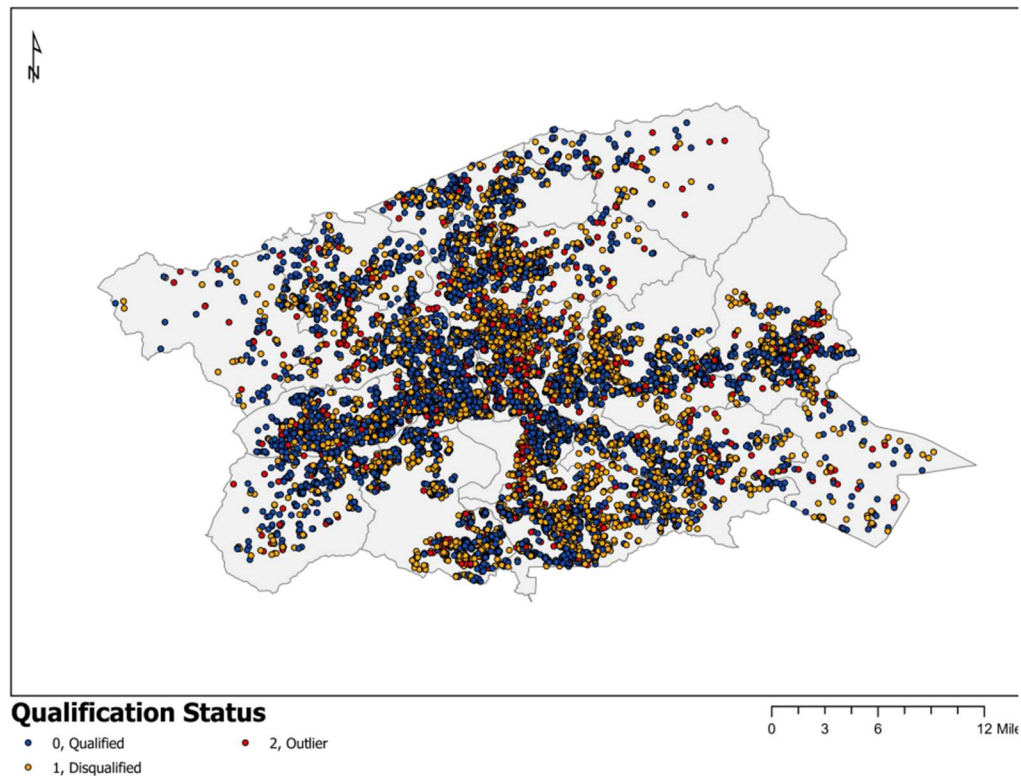
Disqualification rates were also examined by communities. Biltmore has the highest disqualification rates for both reasons. In Biltmore, over 79% of transactions were either disqualified or removed as outliers. The neighboring communities of Oakley and Shiloh/Sweeten Creek have the lowest disqualification rates, retaining over 70% of transactions.

Community			Disqualify			Total
			0	1	2	
BILTMORE	Count		21	58	19	98
	% within Community		21.4%	59.2%	19.4%	100.0%
BROAD RIVER	Count		60	56	19	135
	% within Community		44.4%	41.5%	14.1%	100.0%
CANDLER	Count		180	72	24	276
	% within Community		65.2%	26.1%	8.7%	100.0%
CBD	Count		1	34	0	35
	% within Community		2.9%	97.1%	0.0%	100.0%
EAST ASHEVILLE	Count		488	384	50	922
	% within Community		52.9%	41.6%	5.4%	100.0%
EAST BUNCOMBE	Count		498	367	74	939
	% within Community		53.0%	39.1%	7.9%	100.0%
ENKA	Count		650	283	34	967
	% within Community		67.2%	29.3%	3.5%	100.0%
FAIRVIEW	Count		152	187	27	366
	% within Community		41.5%	51.1%	7.4%	100.0%
FRENCH BROAD	Count		245	129	16	390
	% within Community		62.8%	33.1%	4.1%	100.0%
IVY	Count		76	56	20	152
	% within Community		50.0%	36.8%	13.2%	100.0%
LEICESTER	Count		379	332	75	786
	% within Community		48.2%	42.2%	9.5%	100.0%
MONTFORD	Count		88	81	23	192
	% within Community		45.8%	42.2%	12.0%	100.0%
NORTH ASHEVILLE	Count		374	470	97	941
	% within Community		39.7%	49.9%	10.3%	100.0%
NORTH BUNCOMBE	Count		217	209	17	443
	% within Community		49.0%	47.2%	3.8%	100.0%
NORTH WEST ASHEVILLE	Count		503	218	38	759
	% within Community		66.3%	28.7%	5.0%	100.0%
OAKLEY	Count		257	66	16	339
	% within Community		75.8%	19.5%	4.7%	100.0%
REEMS CREEK	Count		263	237	36	536
	% within Community		49.1%	44.2%	6.7%	100.0%
REYNOLDS	Count		225	276	11	512
	% within Community		43.9%	53.9%	2.1%	100.0%
SANDY MUSH	Count		79	55	16	150
	% within Community		52.7%	36.7%	10.7%	100.0%
SHILOH / SWEETEN CREEK	Count		274	105	11	390
	% within Community		70.3%	26.9%	2.8%	100.0%
SOUTH ASHEVILLE	Count		893	973	71	1937
	% within Community		46.1%	50.2%	3.7%	100.0%
SOUTH WEST BUNCOMBE	Count		773	591	58	1422
	% within Community		54.4%	41.6%	4.1%	100.0%
SOUTHSIDE	Count		44	24	15	83
	% within Community		53.0%	28.9%	18.1%	100.0%
SWANNANOVA	Count		479	423	53	955
	% within Community		50.2%	44.3%	5.5%	100.0%
WEAVERVILLE	Count		189	146	12	347
	% within Community		54.5%	42.1%	3.5%	100.0%
WEST ASHEVILLE	Count		678	410	45	1133
	% within Community		59.8%	36.2%	4.0%	100.0%
WOODFIN	Count		287	287	69	643
	% within Community		44.6%	44.6%	10.7%	100.0%
Total	Count		8373	6529	946	15848
	% within Community		52.8%	41.2%	6.0%	100.0%

Figure 12.2.4 Disqualifications by Community



Buncombe County Sales Qualification



Map 12.2

This map shows that qualified, disqualified and outlier sales are interspersed throughout most communities.

Disqualifications in Disadvantaged Communities

			Disqualify			Total
			0	1	2	
DISAD	0	Count	8209	6439	922	15570
		% within DISAD	52.7%	41.4%	5.9%	100.0%
	1	Count	164	90	24	278
		% within DISAD	59.0%	32.4%	8.6%	100.0%
Total	Count		8373	6529	946	15848
	% within DISAD		52.8%	41.2%	6.0%	100.0%

Figure 12.2.5

This table shows that attribute disqualification rate is lower in the eight Census Block Groups with combined race and income classes 31, 32, 33 and 42 and that outlier disqualification rate is slightly higher in those groups as well.

Disqualifications by Combinations of Race and Income Class

			Disqualify			
			0	1	2	Total
RaceIncomeClass	LE 20% Non-White and LT \$47,000	Count	684	420	97	1201
		% within RaceIncomeClass	57.0%	35.0%	8.1%	100.0%
	LE 20% Non-White and \$47,000 to \$61,999	Count	1030	738	125	1893
		% within RaceIncomeClass	54.4%	39.0%	6.6%	100.0%
	LE 20% Non-White and \$62,000 to \$71,999	Count	1754	1210	142	3106
		% within RaceIncomeClass	56.5%	39.0%	4.6%	100.0%
	LE 20% Non-White and \$72,000 to \$90,000	Count	1344	1122	154	2620
		% within RaceIncomeClass	51.3%	42.8%	5.9%	100.0%
	LE 20% Non-White and GT \$90,000	Count	1261	1529	176	2966
		% within RaceIncomeClass	42.5%	51.6%	5.9%	100.0%
	GT 20% to 40% Non-White and LT \$47,000	Count	407	230	42	679
		% within RaceIncomeClass	59.9%	33.9%	6.2%	100.0%
	GT 20% to 40% Non-White and \$47,000 to \$61,999	Count	270	185	21	476
		% within RaceIncomeClass	56.7%	38.9%	4.4%	100.0%
	GT 20% to 40% Non-White and \$62,000 to \$71,999	Count	260	236	36	532
		% within RaceIncomeClass	48.9%	44.4%	6.8%	100.0%
	GT 20% to 40% Non-White and \$72,000 to \$90,000	Count	221	112	22	355
		% within RaceIncomeClass	62.3%	31.5%	6.2%	100.0%
	GT 20% to 40% Non-White and GT \$90,000	Count	476	388	47	911
		% within RaceIncomeClass	52.3%	42.6%	5.2%	100.0%
	GT 40% to 70% Non-White and LT \$47,000	Count	108	71	10	189
		% within RaceIncomeClass	57.1%	37.6%	5.3%	100.0%
	GT 40% to 70% Non-White and \$47,000 to \$61,999	Count	43	19	12	74
		% within RaceIncomeClass	58.1%	25.7%	16.2%	100.0%
	GT 40% to 70% Non-White and \$62,000 to \$71,999	Count	111	48	11	170
		% within RaceIncomeClass	65.3%	28.2%	6.5%	100.0%
	GT 70% to 90% Non-White and \$47,000 to \$61,999	Count	13	0	2	15
		% within RaceIncomeClass	86.7%	0.0%	13.3%	100.0%
Total		Count	8373	6529	946	15848
		% within RaceIncomeClass	52.8%	41.2%	6.0%	100.0%

Figure 12.2.6

This table details the disqualification rates for the fourteen valid combinations of race class and income class in the county. The lowest rates of attribute disqualification are in the communities with higher percentages of non-white population and the lower income groups, regardless of race. Conversely the highest rates of outlier disqualification are in these same communities.

12.3 Adjusting sales data for time

To have a sufficient number of transactions to support reasonable analysis the analyst must often use several years of sales data. Prices must be adjusted for time to normalize data as of a common date. Many analysts use consumer price indexes or housing indexes to adjust sales for time. The problem with these methods is that they often result in adjustments that are linear and too general to support reliable analysis. Consumer price indexes include food, clothing, gas, guns, and butter, which all change at different rates and probably not in the same direction or degree as real estate.

Housing indexes are often reliable only at regional levels and are not granular enough to trend the prices across submarkets. Therefore, use of generalized indexes is not recommended.

Accurate time trending is a process that requires extensive knowledge of the local markets and sub-markets. Frequently there are multiple time trends in play within one jurisdiction. Some areas or types of property are simply “hotter” than others.

The most accurate method for isolating the effects of time is to build regression models that control for as many other elements as possible before calculating time adjustment factors that can be applied to time adjust all transactions. In order to accurately isolate and capture the effects of time on the Buncombe County residential market, I built and ran four separate regression models – one for the entire county and one for each of the Urban, Suburban and Rural markets. I suspected that the Urban, Suburban and Rural markets would each be subject to different time trends. Each model controlled for Building Size; Lot Size; Type of Building; Quality of Construction; Presence of a Garage; Number of Baths and Powder Rooms; General Time period of construction; and the presence of a finished basement. Each model was successful in accurately isolating the effects of time. Monthly time adjustment factors were developed that allowed for adjustment of all sale prices, calibrated to December of 2023.

These are the resulting 4-year time trends for the Buncombe County Urban, Suburban and Rural Sub-Markets. Notice that no two are the same and none are linear. If we were to use a linear trend (by drawing a straight line from the beginning point to the end point), it is apparent that in all cases we would be correct at the beginning and correct at the end but wrong at every point in between. We can also see that use of a single time trend for all properties cannot possibly yield accurate results.

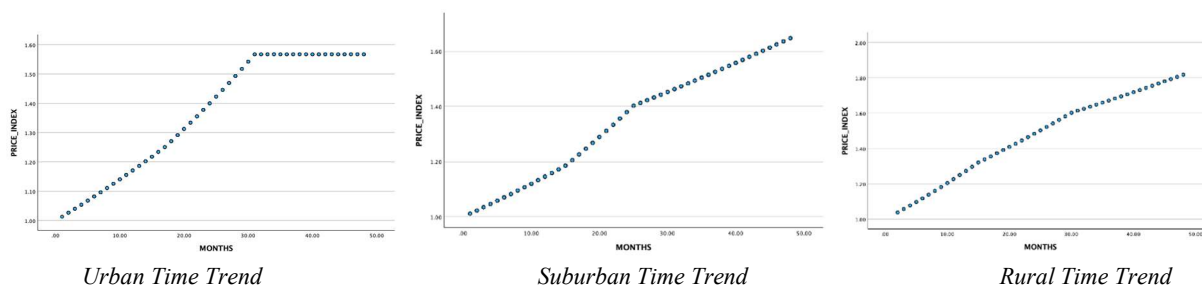


Figure 12.3 Comparison of time trends by development class

To generate a meaningful analysis of bias in the current set of assessments, it was necessary to calibrate time adjustments to the date of the last revaluation – January of 2021. This makes the comparison of Market Value to Price more relevant.

Recommendation: Use regression models to isolate the effects of time in various sub-markets and adjust all prices calibrated to a common target date

12.4 Outlier Removal

When using sales for valuation, as in building regression models, or running a ratio study it is important to remove transactions that are outliers or not representative of typical market activity. The most common methods of removing outliers are simple truncation or Inter-quartile range (IQR). Both techniques require ranking all ratios from highest to lowest. Simple truncation removes the same percentage of ratios from the top and bottom of the arrayed data. IAAO allows for removal of up to 10% of ratios from a large sample size through truncation. Determining the optimal

percentage of transactions to remove can be problematic. The technique also assumes that outliers are evenly distributed at both ends of the ratio array. The IQR method identifies and eliminates the top and bottom quartile of the

arrayed ratios. Many assessment oversight agencies use the IQR method. Either method is useful for reporting one set of statistical performance measures for the entire jurisdiction. Neither should be used if the purpose of the ratio study is diagnostic in nature. If a submarket is highly over-assessed or under-assessed, one runs the risk of eliminating all of the observations that would expose that submarket's performance.

An excellent method of outlier removal is the use of studentized residuals. The process precisely identifies and disqualifies transactions that exert undue influence on a regression model. The main drawback is that it requires building regression models. For this study, I used the regression models that I built to isolate the effects of time and time adjust prices to also identify and flag outliers. In each of the three models, approximately 6% of the transactions were identified as outliers.

13.0 Ratio Study Results for Buncombe County

To identify bias in the assessments, I ran a comprehensive set of diagnostic ratio studies. I examined four different ratios. For each set of ratios, I comparatively tested for the effects of disqualifying transactions where the attributes of the property at the time of valuation are different than the attributes that were present at the time of sale and removing outliers. This produces eight sets of ratios.

- Using current market values and recorded sale prices (sets 1 and 2).
- Using current market values and time-adjusted prices calibrated to December 2023 equivalents (sets 3 and 4)
- Using current market values and time-adjusted prices calibrated to January 2021 equivalents –the date that values were determined in the last re-assessment (sets 5 and 6)
- Using market values estimated by regression models and time-adjusted prices calibrated to December 2023 equivalents Sets 7 and 8)

For each set of ratios, I stratified the results by

- Development class (Rural/Suburban/Urban)
- Community
- Census Block Group
- Year of sale
- Building type
- Size class
- Condition of improvements
- Quality of construction
- Time period of construction (based on 5 defined periods)
- Price class (based on deciles)
- Race class (based on percentage of non-white population)
- Income class (based on even quintiles centered on the median income)
- Combined race and income classes
- Predominately non-white and lower median income vs others

Eight sets of ratios, and the attendant charts, plots and tables seems like a lot – and it is. Yet due diligence requires examination of ratios from as many perspectives as possible. Each set of ratios potentially exposes different information. Until they are run and examined, we cannot know what relevant information will be exposed, or from which set we can gain the best insights. The most important sets were sets 6 and 8.

Set 6 uses current market values and prices that were time adjusted to January of 2021 to coincide with the date of appraisal. This set yields the best picture of the current state of assessments. This set will be the primary statistical indicator of any bias that currently exists.

Set 8 uses market value projections from the regression models and prices time adjusted to December 2023. This allows me to simulate assessment performance after the 2025 reappraisal, and determine what biases will likely exist after the reappraisal. When the 2025 reappraisal projections are released, I will run the same analysis using those values.

I also measured how often values fell within 10%, 20% or 50% of prices or time-adjusted prices for each set of ratios.

I also examined distribution of errors to determine if errors or random or patterned for the sets that disqualified sales.

The full results are available in the Ratio Study Appendix for those who are interested in the details. I have compiled and will discuss the most relevant results here.

Comparison of Ratio Statistics															
Set	Value	Price	Disq Sales	Cases	Mean	Median	Wtd Mean	Min Ratio	Max Ratio	PRB	PRD	COD	Within 10%	Within 20%	Within 50%
1 CMV	Price	No		15848	0.834	0.825	0.806	0.071	12.831	-0.02	1.04	0.178	32.8	53	97.8
2 CMV	Price	Yes		8373	0.81	0.806	0.794	0.084	1.747	0.006	1.02	0.165	30.8	50	98.4
3 CMV	TASP	No		15848	0.663	0.655	0.654	0.069	11.234	0.007	1.01	0.123	1.7	7	94.6
4 CMV	TASP	Yes		8373	0.649	0.649	0.649	0.084	1.208	0.051	1	0.110	0.9	5.1	94.5
5 CMV	TASP2021	No		15848	0.935	0.925	0.923	0.098	15.997	0.007	1.01	0.122	49.0	80.8	99.0
6 CMV	TASP2021	Yes		8373	0.914	0.914	0.914	0.12	1.717	0.048	1	0.108	47.8	81.0	99.6
7 Modeled	TASP	No		15848	1.009	0.998	0.99	0.634	1.723	-0.03	1.02	0.108	53.2	80	92.7
8 Modeled	TASP	Yes		8373	1.015	1.004	0.998	0.664	1.723	-0.04	1.02	0.106	58.3	86.7	98.6

Figure 13.0 – Comparison of Ratio Results

13.1 Set 1 – Current Value to Price – All Sales

Set 1 is based on the current market value and recorded price. This set most closely replicates the results that an analyst who uses public data sources; does not adjust sales for time; does not disqualify sales for non-matching attributes and does not have a good method for removing outliers would produce. Because Values were set in 2021 and prices are current, set 1 primarily serves to show how the market has changed.

13.2 Set 2 – Current Value to Price – Some Sales Disqualified and Outliers Removed

Set 2 is based on the current market value and recorded price. It demonstrates the effects of disqualifying sales and removing outliers from set 1. Because Values were set in 2021 and prices are current, set 2 also primarily serves to show how the market has changed. The most notable exhibit from this set examines the change in median ratio over time by the combination of race.

This line chart shows the change in ratio over time from 2020, when all groups except the 40 to 70% non-white and below the median income were between .95 and 1.00, and 2023, where all groups were between .6 and .7, with the lone exception again being the 40 to 70% non-white and below the median income group which dropped to about .48.

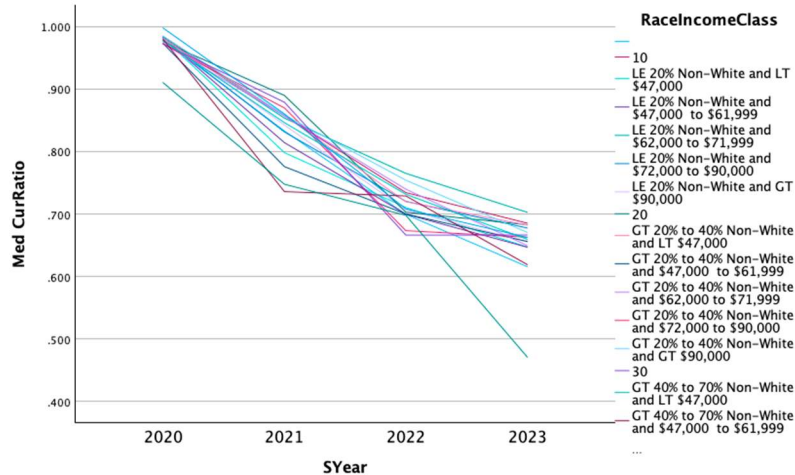


Figure 13.2 Change in ratio over time by Race and income Class

The significance is

- this group was not overvalued as of the last reappraisal
- prices rose much more dramatically in that Census Block Group than in all others

13.3 Set 3 – Current Value to Price Adjusted to December 2023 – All Sales

Set 3 is based on the current market value and prices time adjusted to December 2023. It does not disqualify sales, so it is of limited use.

13.4 Set 4- Current Value to Price Adjusted to December 2023 – Some Sales Disqualified and Outliers Removed

Set 4 is based on the current market value and prices time adjusted to December 2023. It disqualifies sales and gives the best picture of how the market has changed since the last reappraisal.

Ratio Statistics for CMV / Price

Group	Mean	Median	Weighted Mean	Minimum	Maximum	Price Related Bias	Price Related Differential	Coefficient of Dispersion
2020	.974	.981	.974	.484	1.747	.018	1.000	.064
2021	.834	.838	.836	.396	1.455	.056	.998	.118
2022	.732	.723	.729	.337	1.323	.049	1.004	.135
2023	.671	.669	.670	.084	1.115	.057	1.001	.120
Overall	.810	.806	.794	.084	1.747	.006	1.020	.165

Set 2

Ratio Statistics for CMV / TASP

Group	Mean	Median	Weighted Mean	Minimum	Maximum	Price Related Bias	Price Related Differential	Coefficient of Dispersion
2020	.647	.649	.648	.308	1.097	.028	.999	.072
2021	.646	.650	.647	.285	1.038	.060	.997	.113
2022	.654	.648	.652	.310	1.208	.056	1.003	.135
2023	.649	.649	.648	.084	1.032	.057	1.000	.119
Overall	.649	.649	.649	.084	1.208	.051	1.000	.110

Set 4

Figure 13.4 Comparison of ratio statistics stratified by year shows the importance of adjusting prices for time.

Ratio Statistics for CMV / TASP by Race and Income		
Group	Median	Coefficient of Dispersion
LE 20% Non-White and LT \$47,000	0.644	0.140
LE 20% Non-White and \$47,000 to \$61,999	0.647	0.127
LE 20% Non-White and \$62,000 to \$71,999	0.662	0.127
LE 20% Non-White and \$72,000 to \$90,000	0.651	0.121
LE 20% Non-White and GT \$90,000	0.655	0.114
GT 20% to 40% Non-White and LT \$47,000	0.675	0.123
GT 20% to 40% Non-White and \$47,000 to \$61,999	0.640	0.115
GT 20% to 40% Non-White and \$62,000 to \$71,999	0.663	0.120
GT 20% to 40% Non-White and \$72,000 to \$90,000	0.677	0.114
GT 20% to 40% Non-White and GT \$90,000	0.652	0.127
GT 40% to 70% Non-White and LT \$47,000	0.663	0.105
GT 40% to 70% Non-White and \$47,000 to \$61,999	0.629	0.151
GT 40% to 70% Non-White and \$62,000 to \$71,999	0.648	0.119
GT 70% to 90% Non-White and \$47,000 to \$61,999	0.582	0.194
Overall	0.655	0.123

Figure 13.4.1 Median ratio and COD by Race and Income Class

The median ratio for all of the combined race and income classes are very close, showing that the market moved to the same degree for everyone except the group with the highest percentage of non-white population. The lower median indicates prices rose more significantly in that Census Block Group.

13.5 Set 5 – Current Value to Price Adjusted to January 2021 – All Sales

Set 5 is based on the current market value and prices time adjusted to January of 2021 to coincide with the date of the last reappraisal. It does not disqualify sales, so it is of limited use.

13.6 Set 6 – Current Value to Price Adjusted to January 2021- Some Sales Disqualified and Outliers Removed

Set 6 is based on the current market value and prices time adjusted to January of 2021 to coincide with the date of the last reappraisal. It disqualifies sales, and gives us the best test for bias in the current set of assessments.

Determination of bias through ratio results: To claim that assessments are biased in terms of race or income, we would need to see significantly higher median ratios among race classes 3 and 4; income classes 1 and 2 and the race and income combinations 31, 32, and 42. We would also look for race classes 1 and 2; income classes 4 and 5 and the race and income combinations 14, 15; 24 and 25 to have lower median ratios. The benchmarks for median ratio are that they should fall between .9 and 1.1. Medians below .9 indicate significant under-valuation. Those above 1.1 indicate over-valuation. The performance benchmark for COD in the county is less than .20. Variance in COD is expected. Only if it exceeds .20 is it cause for concern. Measurements of vertical equity, PRD and PRB are only significant at the entire county level, not within tested strata. The benchmark for PRD is less than .98 or above 1.03. The benchmark for PRB is below -.05 or higher than .05.

Ratio Statistics for CMV / TASP2021								
Group	Mean	Median	Weighted Mean	Minimum	Maximum	Price Related Bias	Price Related Differential	Coefficient of Dispersion
2020	.910	.915	.911	.441	1.560	.024	.999	.069
2021	.909	.915	.912	.406	1.482	.058	.997	.110
2022	.922	.912	.919	.441	1.717	.052	1.003	.134
2023	.915	.914	.915	.120	1.475	.057	1.000	.119
Overall	.914	.914	.914	.120	1.717	.048	1.000	.108

Figure 13.6.1 These year-by-year results show no significant distortions in the data

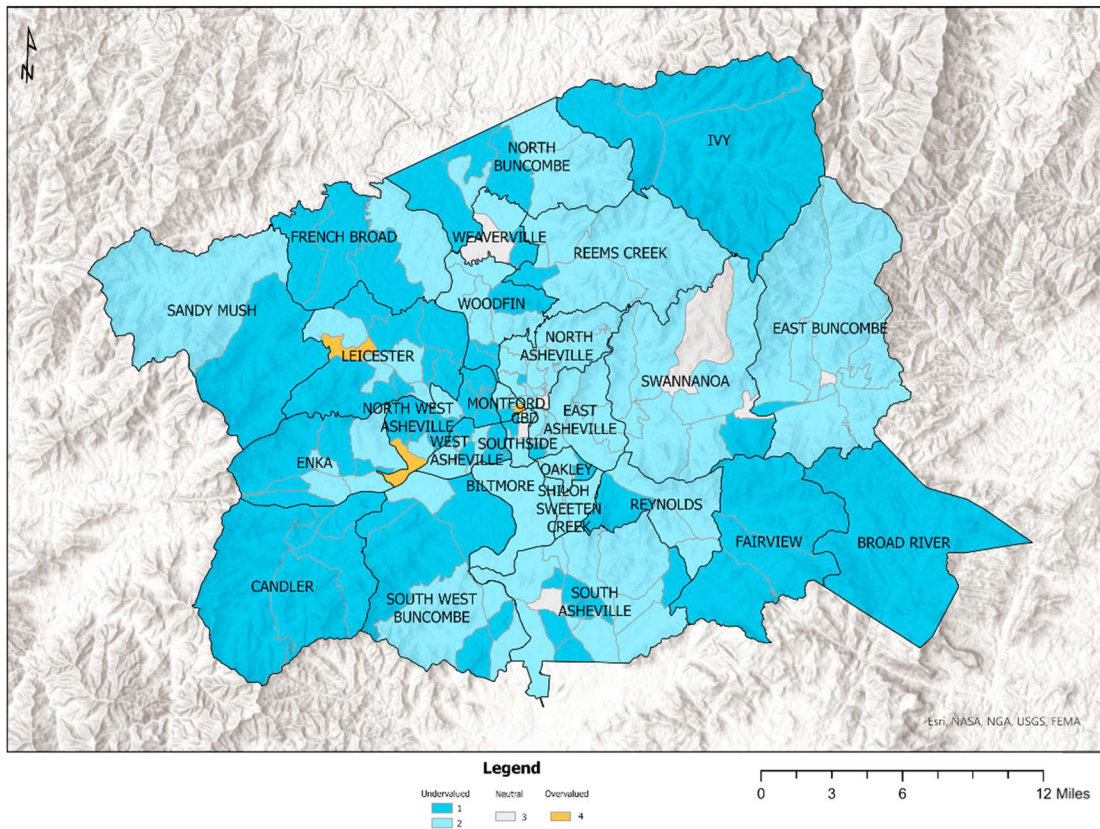
Ratio Statistics for CMV / TASP2021								
Group	Mean	Median	Weighted Mean	Minimum	Maximum	Price Related Bias	Price Related Differential	Coefficient of Dispersion
BILTMORE	.928	.912	.896	.689	1.261	-.047	1.036	.138
BROAD RIVER	.900	.877	.859	.545	1.488	-.093	1.047	.180
CANDLER	.875	.878	.883	.456	1.281	.101	.991	.113
CBD	.925	.925	.925	.925	.925	.	1.000	.000
EAST ASHEVILLE	.937	.934	.931	.561	1.459	.014	1.006	.094
EAST BUNCOMBE	.937	.931	.941	.541	1.589	.076	.996	.111
ENKA	.897	.902	.906	.426	1.338	.110	.991	.119
FAIRVIEW	.861	.862	.866	.540	1.229	.050	.995	.123
FRENCH BROAD	.879	.891	.888	.460	1.215	.091	.990	.109
IVY	.876	.873	.888	.441	1.322	.110	.986	.140
LEICESTER	.880	.887	.882	.120	1.280	.073	.997	.112
MONTFORD	.964	.967	.974	.721	1.247	.077	.990	.106
NORTH ASHEVILLE	.931	.928	.931	.551	1.295	.040	.999	.096
NORTH BUNCOMBE	.882	.875	.886	.546	1.455	.077	.996	.107
NORTH WEST ASHEVILLE	.917	.910	.921	.156	1.448	.136	.996	.137
OAKLEY	.900	.898	.901	.634	1.382	.100	.998	.087
REEMS CREEK	.926	.921	.930	.505	1.396	.070	.996	.103
REYNOLDS	.931	.926	.931	.583	1.307	.062	1.000	.108
SANDY MUSH	.828	.829	.829	.449	1.482	.037	.998	.173
SHILOH / SWEETEN CREEK	.918	.917	.919	.584	1.344	.091	.999	.087
SOUTH ASHEVILLE	.921	.919	.913	.441	1.560	.009	1.009	.096
SOUTH WEST BUNCOMBE	.919	.921	.912	.406	1.321	.030	1.007	.104
SOUTHSIDE	.911	.906	.905	.733	1.190	-.029	1.007	.078
SWANNANOVA	.940	.933	.938	.485	1.717	.039	1.001	.110
WEAVERVILLE	.964	.970	.943	.608	1.263	-.096	1.023	.105
WEST ASHEVILLE	.904	.907	.900	.636	1.194	.006	1.005	.086
WOODFIN	.911	.923	.913	.465	1.290	.080	.998	.119
Overall	.914	.914	.914	.120	1.717	.048	1.000	.108

Figure 13.6.2 Ratios calibrated to January 2021 by Community

Ratio results by community show that the highest ratios are not in the predominately non-white communities, but in places like Montford, Weaverville, East Asheville and East Buncombe. COD is good everywhere, although Broad River and Sandy Mush show the poorest uniformity. This is not surprising considering the wide variety of properties found there. Overall, there is no indication of vertical inequity.

This map shows Current median ratio class by census block groups within communities. Even though all of the communities are in ratio class 1 or 2, it shows that there is variance in median ratios within most of the communities, and a few census block groups that are overvalued.

Buncombe County Current Median Ratio Class



Map 13.6.1 Current Median Ratio by Census Block groups

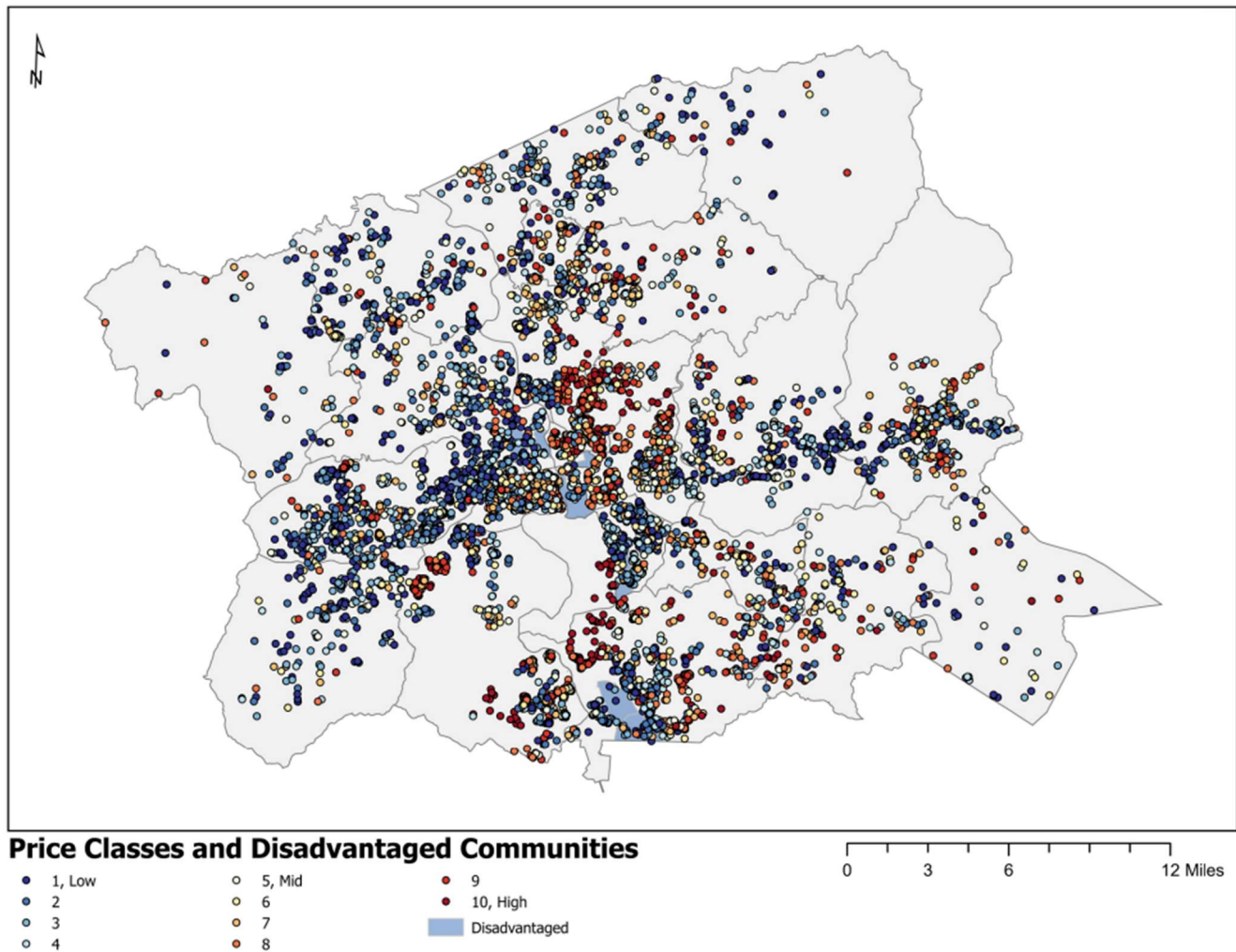
This map of median ratios by Census Block Groups shows that almost all are undervalued and only two are currently slightly overvalued. Overvaluation is not in the disadvantaged communities, which we would expect to see if racial or income bias were present.

Group	Mean	Median	Weighted Mean	Minimum	Maximum	Price Related Bias	Price Related Differential	Coefficient of Dispersion
Below 230k	.885	.894	.886	.406	1.717	.120	.999	.135
230k to 275k	.900	.903	.901	.449	1.324	.278	.999	.104
275k to 315k	.923	.921	.923	.485	1.440	.265	1.001	.107
315k to 350k	.925	.923	.923	.485	1.424	.244	1.002	.109
350k to 400k	.923	.918	.922	.159	1.459	.247	1.001	.100
400k to 450k	.920	.922	.921	.120	1.379	.285	1.000	.104
450k to 520k	.910	.908	.909	.561	1.329	.249	1.001	.101
520k to 625k	.920	.917	.919	.156	1.382	.233	1.000	.100
625k to 815k	.919	.922	.918	.441	1.589	.252	1.001	.104
815k+	.916	.912	.902	.428	1.295	-.001	1.016	.117
Overall	.914	.914	.914	.120	1.717	.048	1.000	.108

Figure 13.6.3 Ratios calibrated to January 2021 by Price Class

Ratio results by price points show a slight bias in favor of the lowest price properties. The COD is good across all price classes.

Buncombe County Current Price Class



Map 13.6.2 Prices adjusted to January 2021 by Community

This map shows that sales in all price classes are distributed throughout all communities. There are very few exclusively high or low priced communities, including the disadvantaged communities.

Group	Mean	Median	Weighted Mean	Minimum	Maximum	Price Related Bias	Price Related Differential	Coefficient of Dispersion
LE 20% Non-White	.914	.915	.915	.120	1.589	.049	.999	.110
GT 20% to 40% Non-White	.916	.915	.914	.156	1.717	.042	1.002	.104
GT 40% to 70% Non-White	.906	.903	.906	.514	1.306	.047	1.000	.091
GT 70% to 90% Non-White	.825	.828	.833	.624	1.001	.137	.990	.116
Overall	.914	.914	.914	.120	1.717	.048	1.000	.108

Figure 13.6.4 Ratios calibrated to January 2021 by Race Class

Ratio statistics by Race Class shows that block groups with higher non-white populations are actually assessed at lower levels than other communities.

Ratio Statistics for CMV / TASP2021

Group	Mean	Median	Weighted Mean	Minimum	Maximum	Price Related Bias	Price Related Differential	Coefficient of Dispersion
LT \$47,000	.904	.910	.907	.441	1.488	.048	.997	.110
\$47,000 to \$61,999	.885	.892	.893	.120	1.455	.089	.992	.113
\$62,000 to \$71,999	.937	.931	.938	.406	1.717	.066	.999	.115
\$72,000 to \$90,000	.912	.913	.915	.453	1.589	.051	.997	.106
GT \$90,000	.914	.913	.907	.422	1.560	.014	1.008	.098
Overall	.914	.914	.914	.120	1.717	.048	1.000	.108

Figure 13.6.5 Ratios calibrated to January 2021 by Income Class

Ratio statistics by Income Class shows no bias in level of assessment.

Ratio Statistics for CMV / TASP2021

Group	Mean	Median	Weighted Mean	Minimum	Maximum	Price Related Bias	Price Related Differential	Coefficient of Dispersion
LE 20% Non-White and LT \$47,000	.895	.903	.897	.441	1.488	.039	.998	.122
LE 20% Non-White and \$47,000 to \$61,999	.888	.894	.896	.120	1.455	.094	.991	.116
LE 20% Non-White and \$62,000 to \$71,999	.940	.933	.941	.406	1.448	.066	.999	.116
LE 20% Non-White and \$72,000 to \$90,000	.914	.915	.918	.453	1.589	.058	.996	.108
LE 20% Non-White and GT \$90,000	.906	.909	.902	.422	1.560	.019	1.005	.094
GT 20% to 40% Non-White and LT \$47,000	.920	.927	.923	.504	1.382	.067	.996	.092
GT 20% to 40% Non-White and \$47,000 to \$61,999	.882	.892	.881	.156	1.244	.071	1.001	.104
GT 20% to 40% Non-White and \$62,000 to \$71,999	.921	.910	.925	.465	1.717	.083	.995	.122
GT 20% to 40% Non-White and \$72,000 to \$90,000	.901	.899	.895	.660	1.155	-.021	1.007	.091
GT 20% to 40% Non-White and GT \$90,000	.934	.926	.920	.428	1.274	.006	1.015	.107
GT 40% to 70% Non-White and LT \$47,000	.898	.905	.895	.514	1.306	.040	1.004	.093
GT 40% to 70% Non-White and \$47,000 to \$61,999	.870	.882	.880	.548	1.187	.093	.989	.096
GT 40% to 70% Non-White and \$62,000 to \$71,999	.924	.919	.923	.682	1.167	.030	1.002	.083
GT 70% to 90% Non-White and \$47,000 to \$61,999	.825	.828	.833	.624	1.001	.137	.990	.116
Overall	.914	.914	.914	.120	1.717	.048	1.000	.108

Figure 13.6.6 Ratios calibrated to January 2021 by Race and Income Class

Combining race and income classes reveals no patterns of systemic overassessment.

Ratio Statistics for CMV / TASP2021

Group	Mean	Median	Weighted Mean	Minimum	Maximum	Price Related Bias	Price Related Differential	Coefficient of Dispersion
0	.914	.915	.915	.120	1.717	.048	1.000	.108
1	.885	.890	.887	.514	1.306	.065	.998	.098
Overall	.914	.914	.914	.120	1.717	.048	1.000	.108

Figure 13.6.7 Ratios calibrated to January 2021 comparing non-disadvantaged to disadvantaged communities

Finally, comparing disadvantaged communities to non-disadvantaged communities does not reveal systemic overassessment.

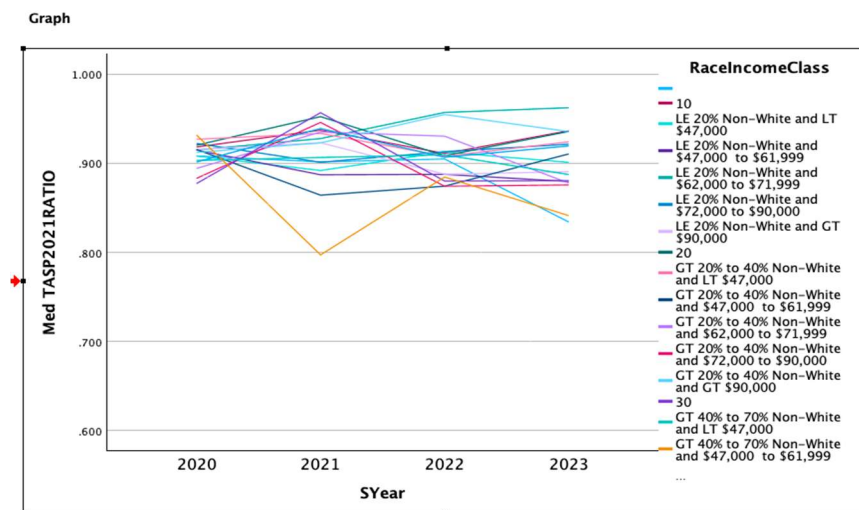


Figure 13.6.8 Comparison of change over time by Race and Income Class

A year-by-year line chart by Race and Income Class shows some variance, but not systemic overassessment of non-white lower income populations.

Beyond ratio analysis, we can examine the distribution of errors to determine if there is systemic bias in assessments. There will always be errors, but if those errors are randomly distributed then there is no systemic bias. If systemic bias exists, all disadvantaged communities will be assessed at higher levels than non-disadvantaged communities. If anecdotal bias exists, a disproportionate number of properties in disadvantaged communities will be assessed at higher levels than non-disadvantaged communities.

By grouping ratios by classes, ranging from severely under-assessed to severely over assessed, distribution of ratios can be examined. Ideally, all groups would be in ratio classes 2, 3 and 4 – which fall within the IAAO performance standard.

class	RatioClassDesc
1	Less than .9
2	Between .9 and .97
3	Between .97 and 1.03
4	Between 1.03 and 1.1
5	Over 1.1

In Buncombe County, about 45% of the current ratios are in class 1. This table shows the distribution of ratios (by ratio class) for each of the combinations of Race and Income.

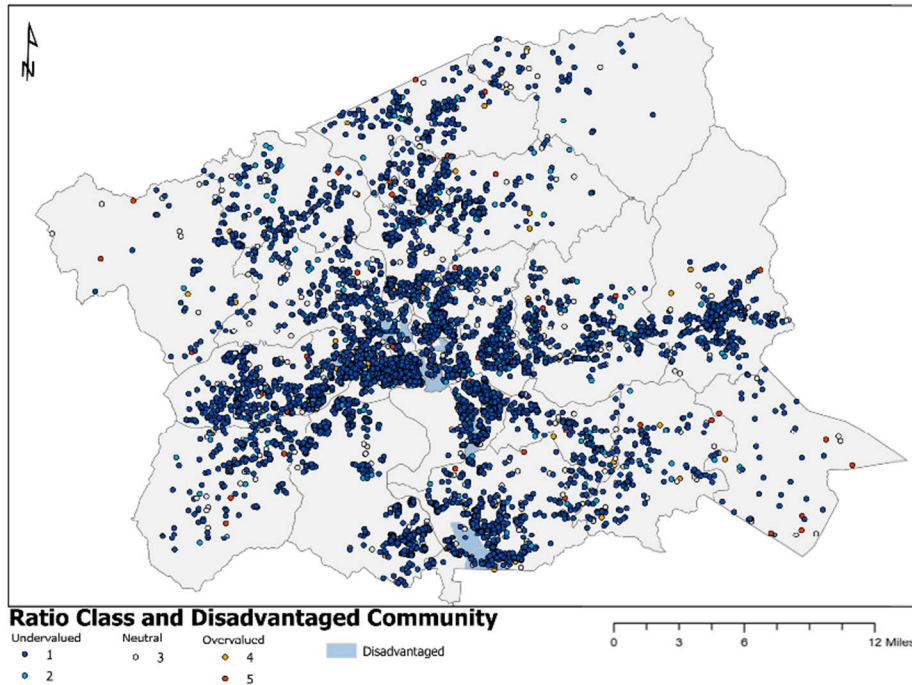
RaceIncomeClass * TASP2021RATIOCLASS Crosstabulation		TASP2021RATIOCLASS					Total
RaceIncomeClass		1.00	2.00	3.00	4.00	5.00	
LE 20% Non-White and LT \$47,000	LE 20% Non-White and LT \$47,000	336	137	140	26	45	684
		49.1%	20.0%	20.5%	3.8%	6.6%	100.0%
	LE 20% Non-White and \$47,000 to \$61,999	535	169	228	47	51	1030
		51.9%	16.4%	22.1%	4.6%	5.0%	100.0%
	LE 20% Non-White and \$62,000 to \$71,999	656	326	399	157	216	1754
		37.4%	18.6%	22.7%	9.0%	12.3%	100.0%
	LE 20% Non-White and \$72,000 to \$90,000	609	245	326	60	104	1344
		45.3%	18.2%	24.3%	4.5%	7.7%	100.0%
	LE 20% Non-White and GT \$90,000	581	259	305	55	61	1261
		46.1%	20.5%	24.2%	4.4%	4.8%	100.0%
	GT 20% to 40% Non-White and LT \$47,000	170	80	122	14	21	407
		41.8%	19.7%	30.0%	3.4%	5.2%	100.0%
	GT 20% to 40% Non-White and \$47,000 to \$61,999	146	46	62	10	6	270
		54.1%	17.0%	23.0%	3.7%	2.2%	100.0%
	GT 20% to 40% Non-White and \$62,000 to \$71,999	121	39	57	18	25	260
		46.5%	15.0%	21.9%	6.9%	9.6%	100.0%
	GT 20% to 40% Non-White and \$72,000 to \$90,000	111	40	57	9	4	221
		50.2%	18.1%	25.8%	4.1%	1.8%	100.0%
	GT 20% to 40% Non-White and GT \$90,000	197	73	124	30	52	476
		41.4%	15.3%	26.1%	6.3%	10.9%	100.0%
GT 40% to 70% Non-White and LT \$47,000	GT 40% to 70% Non-White and LT \$47,000	50	28	23	2	5	108
		46.3%	25.9%	21.3%	1.9%	4.6%	100.0%
	GT 40% to 70% Non-White and \$47,000 to \$61,999	28	5	9	0	1	43
		65.1%	11.6%	20.9%	0.0%	2.3%	100.0%
GT 40% to 70% Non-White and \$62,000 to \$71,999	GT 40% to 70% Non-White and \$62,000 to \$71,999	48	21	34	4	4	111
		43.2%	18.9%	30.6%	3.6%	3.6%	100.0%
GT 70% to 90% Non-White and \$47,000 to \$61,999	GT 70% to 90% Non-White and \$47,000 to \$61,999	9	2	2	0	0	13
		69.2%	15.4%	15.4%	0.0%	0.0%	100.0%
Total		3757	1546	1996	457	617	8373
		44.9%	18.5%	23.8%	5.5%	7.4%	100.0%

Figure 13.6.9 Distribution of ratios by Ratio Class by Race and Income Class

Among communities that are more than 40% non-white, undervaluation is actually more common and overvaluation less common than the aggregate for the county.

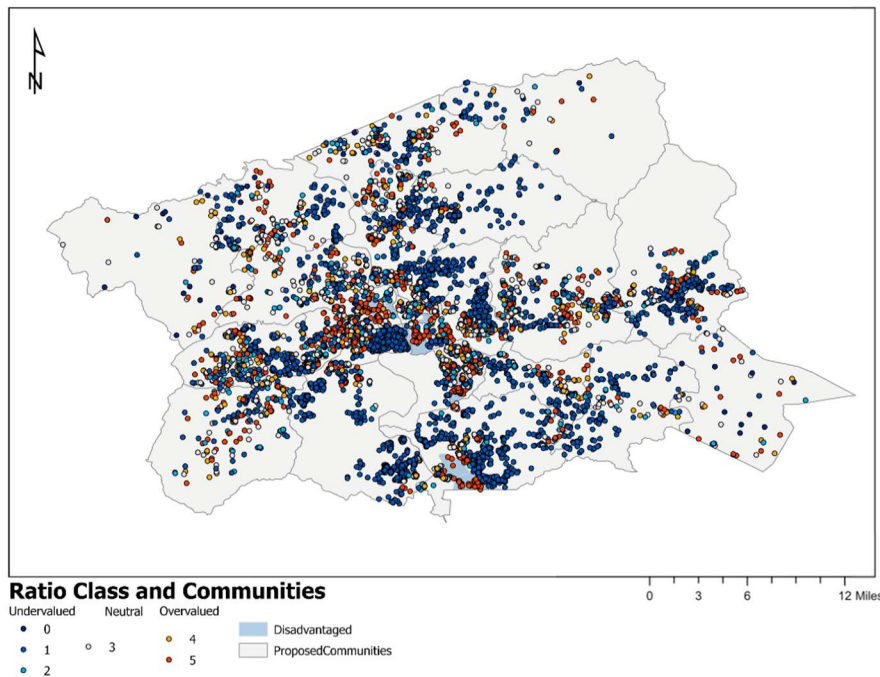
Map 13.6.3 shows the ratio class for each sale and helps to visualize the distribution of errors. The map shows that most of the county is undervalued, and there is no dominant geographic pattern of overvaluation in the disadvantaged communities. If there were demographic biases, overvalued properties would be concentrated in the disadvantaged communities and most undervalued properties would be in the mostly white high income census block groups, as shown in map 13.6.4.

Buncombe County Current Sales Ratio



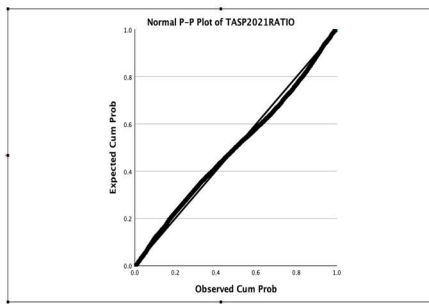
Map 13.6.3

Buncombe County False Bias Sales Ratio

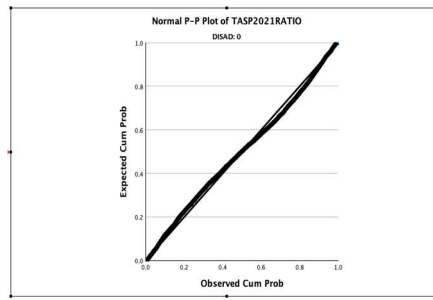


Map 13.6.4

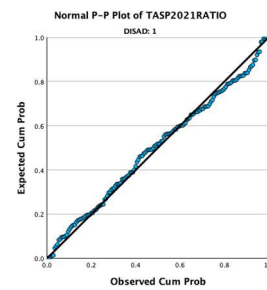
Another way of visualizing the distribution of errors is through the use of a normalized P – P plot. If errors are randomly distributed, the line will be very close to the fit line, as seen in all three plots below.



Aggregate plot for the county



Plot for Advantaged communities



Plot for Dis-advantaged communities

Figure 13.6.10 Normalized error plots show no disparities

More importantly, when the plots for advantaged vs disadvantaged communities are compared, both will be similar to the aggregate plot as well as to one another, as seen here.

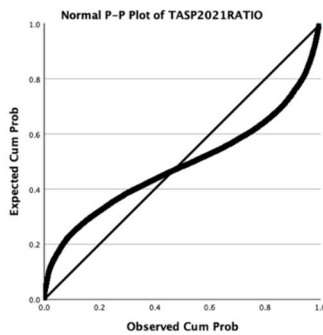


Figure 13.6.11: The normalized P Plot without disqualifying sales shows non-random error distribution

This is the aggregate plot for the county without disqualifying sales, illustrating the importance of using qualified sales data.

Finally, the scatterplot in figure 13.6.12 shows each transaction as a point where the market value intersects with the price time adjusted to January of 2021. Points are color coded by Race Class. The fit line is where price and value are equal. Points are fairly close to the fit line throughout the price spectrum, with points of all colors both above and below the fit line. With systemic bias, most or all points of one color would be either above or below the line, not distributed on both sides of the fit line. The drop-off to the right in the upper price range is common. This is typical because prices for high-end properties are not predictable based on property attributes. We can't explain *why* people pay more than expected for these properties – they just do.

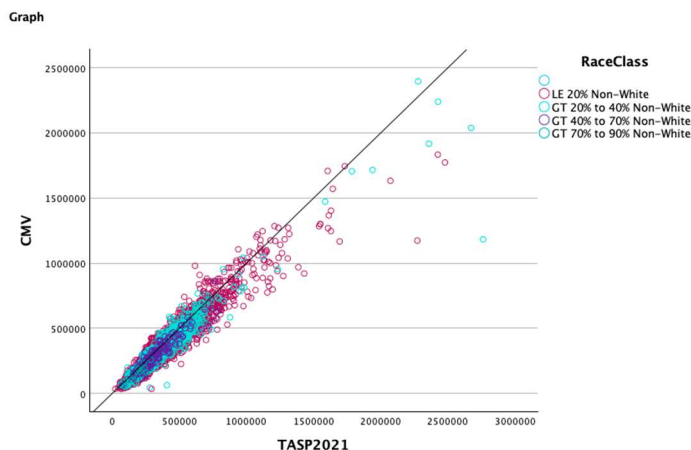


Figure 13.6.12 This scatterplot indicates equitable distribution of errors throughout the price spectrum, with no bias by race or income

By contrast, figure 13.6.13 is an example of a scatterplot that shows poor assessment performance. This scatterplot clearly shows systemic overvaluation of lower priced properties and undervaluation of higher priced properties.

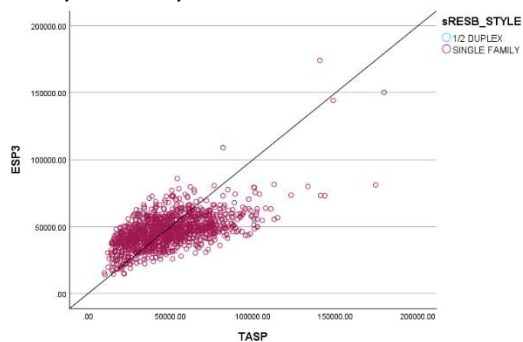


Figure 13.6.13 This scatterplot indicates systemic overvaluation of low-priced and undervaluation of high-priced properties

None of the tests or visualizations for set 6 demonstrate bias in favor of or against *any* demographic group.

13.7 Set 7 – Modeled Value to Price Adjusted to December 2023 – All Sales

Set 7 uses predicted values from the regression models and prices time adjusted to December 2023. It does not disqualify sales, so it is of limited use and not presented here.

13.8 Set 8- Modeled Value to Price Adjusted to December 2023 – Some Sales Disqualified and Outliers Removed

uses predicted values from the regression models and prices time adjusted to December 2023. It disqualifies sales and gives a reasonable approximation of assessment performance that will result from the 2025 reappraisal. These are *projected* numbers and may differ from the values that will be released in November of 2024. They serve to warn where there might be bias in the 2025 assessments. When the values are released in November, this study will be updated.

Ratio Statistics for MValue / TASP

Group	Mean	Median	Weighted Mean	Minimum	Maximum	Price Related Bias	Price Related Differential	Coefficient of Dispersion
2020	1.016	1.006	1.000	.666	1.703	-.047	1.017	.101
2021	1.013	1.000	.998	.664	1.519	-.031	1.015	.106
2022	1.014	1.004	.996	.664	1.723	-.037	1.018	.109
2023	1.016	1.007	.999	.675	1.623	-.027	1.016	.106
Overall	1.015	1.004	.998	.664	1.723	-.036	1.016	.106

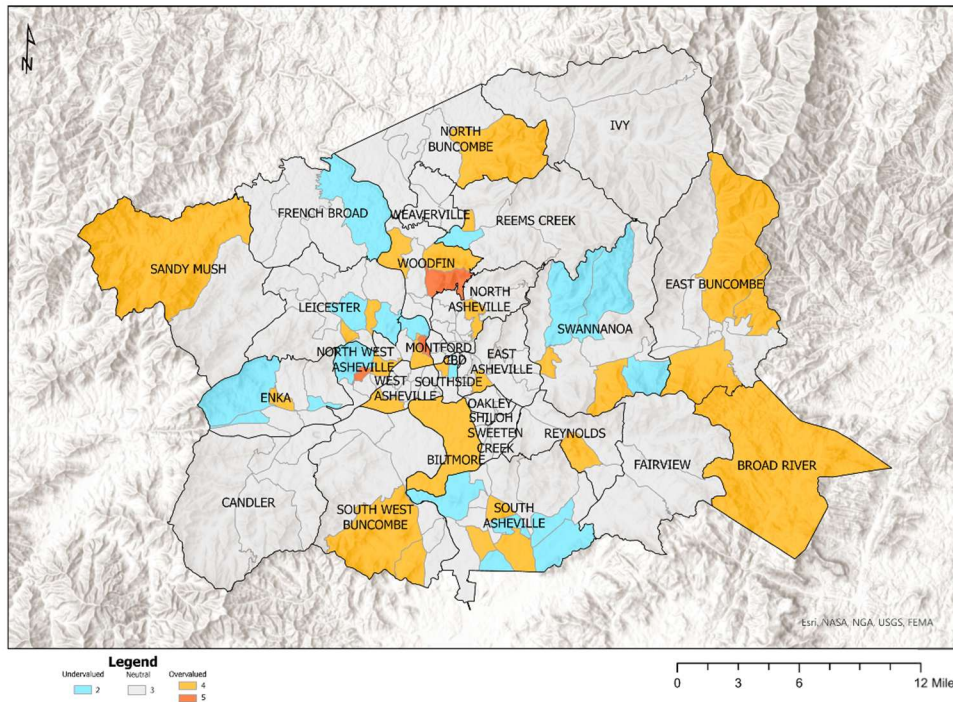
Figure 13.8.1 These year-by-year results with prices adjusted to December of 2023 show no significant distortions in ratios

Group	Mean	Median	Weighted Mean	Minimum	Maximum	Price Related Bias	Price Related Differential	Coefficient of Dispersion
BILTMORE	1.074	1.054	1.054	.735	1.342	-.032	1.019	.133
BROAD RIVER	1.037	1.035	.998	.703	1.623	-.050	1.039	.128
CANDLER	1.015	1.010	1.001	.738	1.535	-.049	1.014	.102
CBD	1.000	1.000	1.000	1.000	1.000	.	1.000	.000
EAST ASHEVILLE	1.015	1.013	1.002	.704	1.417	-.032	1.014	.101
EAST BUNCOMBE	1.021	1.017	1.000	.664	1.434	-.061	1.021	.114
ENKA	1.008	.993	.991	.703	1.570	-.053	1.017	.114
FAIRVIEW	1.025	1.002	1.003	.697	1.445	-.033	1.021	.116
FRENCH BROAD	1.019	.992	.995	.715	1.548	-.081	1.024	.119
IVY	1.029	1.007	.999	.730	1.424	-.072	1.031	.133
LEICESTER	1.005	.997	.988	.707	1.407	-.063	1.017	.096
MONTFORD	1.006	1.006	.994	.754	1.332	-.025	1.012	.103
NORTH ASHEVILLE	1.003	.991	.987	.685	1.396	-.043	1.016	.101
NORTH BUNCOMBE	1.015	1.008	.996	.664	1.723	-.070	1.019	.114
NORTH WEST ASHEVILLE	1.019	1.007	1.005	.716	1.572	-.063	1.015	.110
OAKLEY	1.001	1.005	.992	.762	1.334	-.051	1.009	.090
REEMS CREEK	1.017	1.021	1.004	.674	1.443	-.035	1.013	.092
REYNOLDS	1.000	.982	.995	.721	1.369	.016	1.005	.103
SANDY MUSH	1.023	1.007	.993	.707	1.703	-.069	1.030	.115
SHILOH / SWEETEN CREEK	1.013	.996	1.003	.722	1.446	-.051	1.010	.091
SOUTH ASHEVILLE	1.021	1.004	1.008	.725	1.524	-.014	1.013	.105
SOUTH WEST BUNCOMBE	1.019	1.013	.996	.666	1.556	-.038	1.023	.101
SOUTHSIDE	1.006	1.006	.995	.802	1.282	-.076	1.011	.085
SWANNANOVA	1.003	.985	.977	.702	1.572	-.092	1.026	.123
WEAVERVILLE	1.004	1.009	.990	.676	1.412	-.044	1.014	.101
WEST ASHEVILLE	1.014	1.006	1.001	.724	1.381	-.060	1.013	.092
WOODFIN	1.032	1.006	1.014	.745	1.536	-.052	1.018	.112
Overall	1.015	1.004	.998	.664	1.723	-.036	1.016	.106

Figure 13.8.2 Ratios by Community with prices adjusted to December of 2023

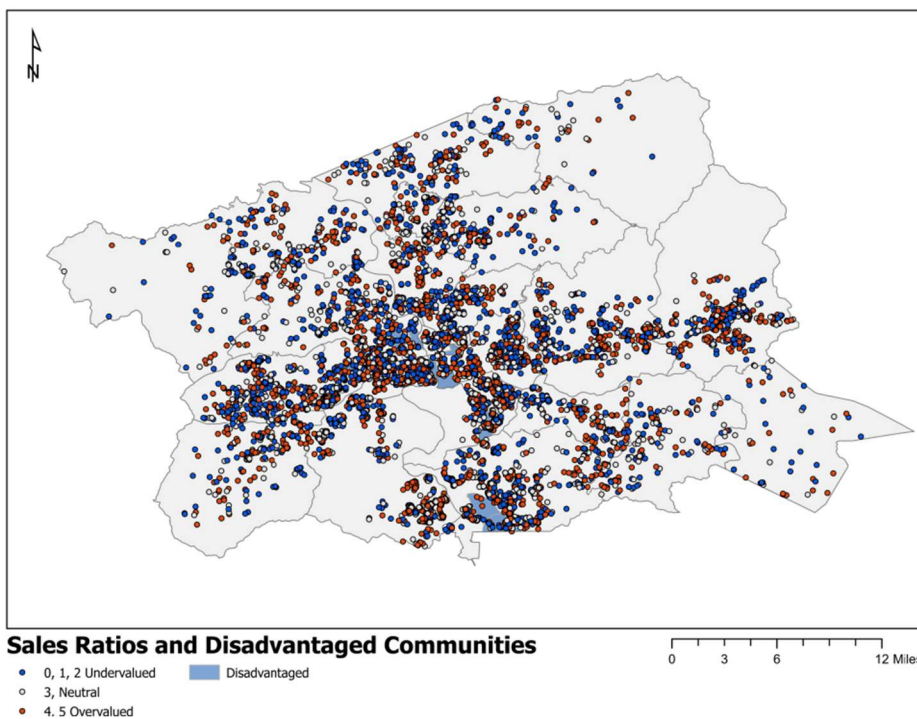
Ratio results by community show that the highest ratios will be not in the predominately non-white communities, but in Biltmore and Broad River – although all communities are very close to 1.00. COD is good everywhere, although Biltmore, Broad River and Ivy show the poorest uniformity. Overall, there is no indication of vertical inequity.

Buncombe County Modeled Ratio Class



Map 13.8.1 Shows Communities that may be undervalued or overvalued in January of 2025

Buncombe County Modeled Ratio Sales



Map 13.8.2

Ratio Statistics for MValue / TASP								
Group	Mean	Median	Weighted Mean	Minimum	Maximum	Price Related Bias	Price Related Differential	Coefficient of Dispersion
FAIR	.983	.960	.950	.725	1.300	-.100	1.035	.125
GOOD	1.010	.998	.999	.666	1.519	-.017	1.011	.109
NORMAL	1.016	1.005	.997	.664	1.723	-.046	1.019	.105
POOR	1.010	1.026	1.006	.813	1.126	-.007	1.004	.066
RENOVATED	1.017	1.009	1.006	.664	1.623	-.022	1.011	.102
Overall	1.015	1.004	.998	.664	1.723	-.036	1.016	.106

Figure 13.8.3

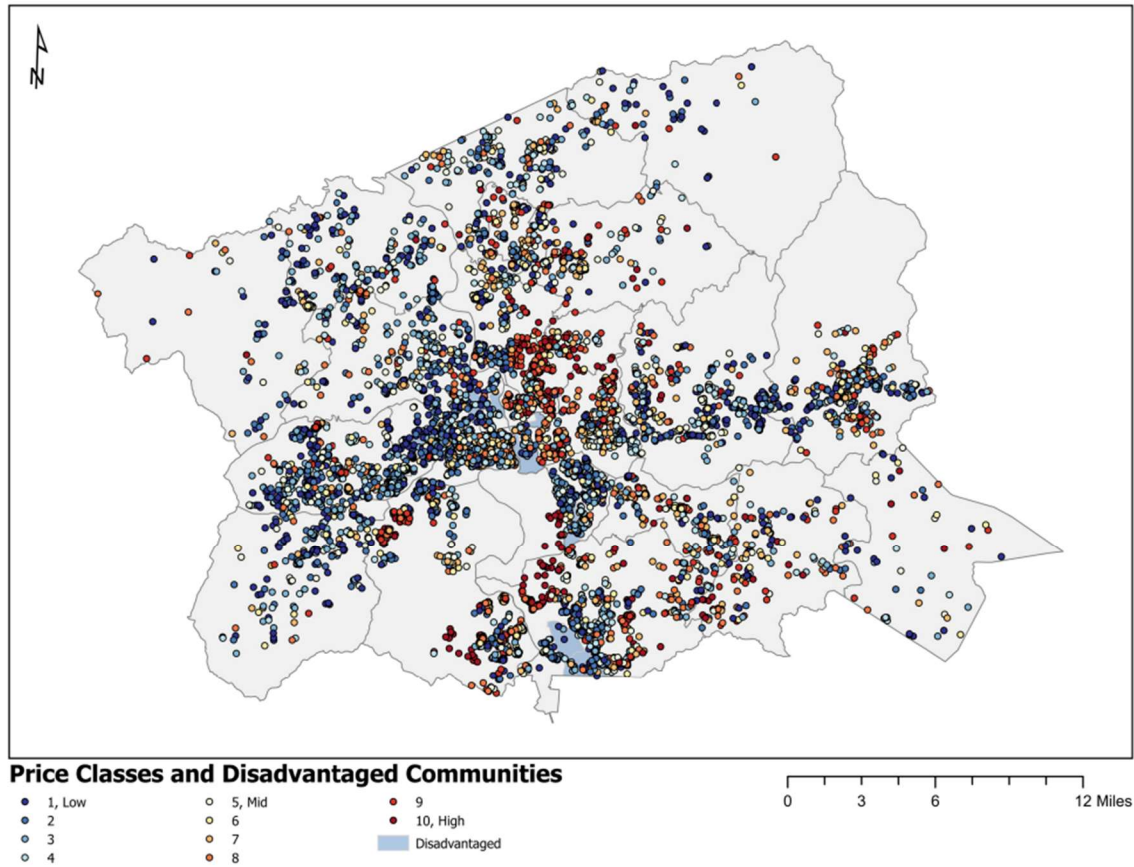
Ratio results by condition shows no bias. The COD is good for properties in all conditions.

Ratio Statistics for MValue / TASP								
Group	Mean	Median	Weighted Mean	Minimum	Maximum	Price Related Bias	Price Related Differential	Coefficient of Dispersion
Below 230k	1.094	1.074	1.076	.739	1.723	-.068	1.017	.128
230k to 275k	1.030	1.022	1.029	.716	1.475	.202	1.002	.101
275k to 315k	1.022	1.020	1.021	.702	1.493	.188	1.001	.095
315k to 350k	1.021	1.018	1.019	.725	1.446	.178	1.001	.092
350k to 400k	1.006	.996	1.004	.674	1.536	.169	1.003	.098
400k to 450k	1.007	1.000	1.005	.664	1.387	.211	1.001	.098
450k to 520k	.991	.986	.990	.666	1.387	.204	1.002	.098
520k to 625k	.977	.972	.975	.675	1.381	.156	1.002	.095
625k to 815k	.959	.952	.957	.664	1.392	.200	1.002	.100
815k+	.952	.923	.947	.675	1.416	.066	1.005	.127
Overall	1.015	1.004	.998	.664	1.723	-.036	1.016	.106

Figure 13.8.4

Ratio results by price points show slight bias against the lowest price properties and in favor of the highest price properties. The COD is very good in all price classes.

Buncombe County Modeled Price Class



Map 13.8.3

Group	Mean	Median	Weighted Mean	Minimum	Maximum	Price Related Bias	Price Related Differential	Coefficient of Dispersion
LE 20% Non-White	1.012	1.000	.996	.664	1.723	-.036	1.017	.107
GT 20% to 40% Non-White	1.024	1.019	1.007	.679	1.572	-.035	1.016	.100
GT 40% to 70% Non-White	1.010	1.003	.997	.723	1.494	-.042	1.013	.096
GT 70% to 90% Non-White	1.067	1.139	1.054	.818	1.383	-.015	1.012	.111
Overall	1.015	1.004	.998	.664	1.723	-.036	1.016	.106

Figure 13.8.5

Ratio statistics by Race Class shows that block groups with higher non-white populations may be assessed at higher levels than other communities. These should be reviewed before finalizing the values.

Group	Mean	Median	Weighted Mean	Minimum	Maximum	Price Related Bias	Price Related Differential	Coefficient of Dispersion
LT \$47,000	1.009	.995	.991	.666	1.623	-.054	1.019	.108
\$47,000 to \$61,999	1.013	1.003	.998	.664	1.703	-.040	1.014	.102
\$62,000 to \$71,999	1.010	1.000	.994	.666	1.723	-.053	1.017	.109
\$72,000 to \$90,000	1.014	1.000	.996	.664	1.556	-.048	1.018	.106
GT \$90,000	1.025	1.018	1.006	.675	1.538	-.027	1.019	.105
Overall	1.015	1.004	.998	.664	1.723	-.036	1.016	.106

Figure 13.8.6

Ratio statistics by Income Class anticipate no bias in level of assessment.

Group	Mean	Median	Weighted Mean	Minimum	Maximum	Price Related Bias	Price Related Differential	Coefficient of Dispersion
LE 20% Non-White and LT \$47,000	1.012	.989	.988	.666	1.623	-.063	1.024	.116
LE 20% Non-White and \$47,000 to \$61,999	1.013	1.004	.999	.664	1.703	-.037	1.014	.103
LE 20% Non-White and \$62,000 to \$71,999	1.009	.999	.992	.666	1.723	-.053	1.017	.110
LE 20% Non-White and \$72,000 to \$90,000	1.012	.997	.993	.664	1.556	-.046	1.019	.107
LE 20% Non-White and GT \$90,000	1.017	1.004	1.002	.675	1.538	-.018	1.015	.108
GT 20% to 40% Non-White and LT \$47,000	1.005	1.003	.995	.716	1.535	-.027	1.011	.097
GT 20% to 40% Non-White and \$47,000 to \$61,999	1.010	1.003	.997	.738	1.572	-.069	1.013	.096
GT 20% to 40% Non-White and \$62,000 to \$71,999	1.018	1.003	1.002	.758	1.572	-.064	1.016	.107
GT 20% to 40% Non-White and \$72,000 to \$90,000	1.028	1.021	1.013	.761	1.368	-.070	1.015	.098
GT 20% to 40% Non-White and GT \$90,000	1.047	1.043	1.019	.679	1.408	-.051	1.028	.094
GT 40% to 70% Non-White and LT \$47,000	1.007	1.004	.992	.723	1.494	-.092	1.015	.096
GT 40% to 70% Non-White and \$47,000 to \$61,999	.999	.969	.981	.756	1.489	-.071	1.018	.102
GT 40% to 70% Non-White and \$62,000 to \$71,999	1.013	1.008	1.004	.756	1.291	-.017	1.010	.090
GT 70% to 90% Non-White and \$47,000 to \$61,999	1.067	1.139	1.054	.818	1.383	-.015	1.012	.111
Overall	1.015	1.004	.998	.664	1.723	-.036	1.016	.106

Figure 13.8.7

Combining race and income classes shows that overassessment may occur in the block group with the highest non-white population.

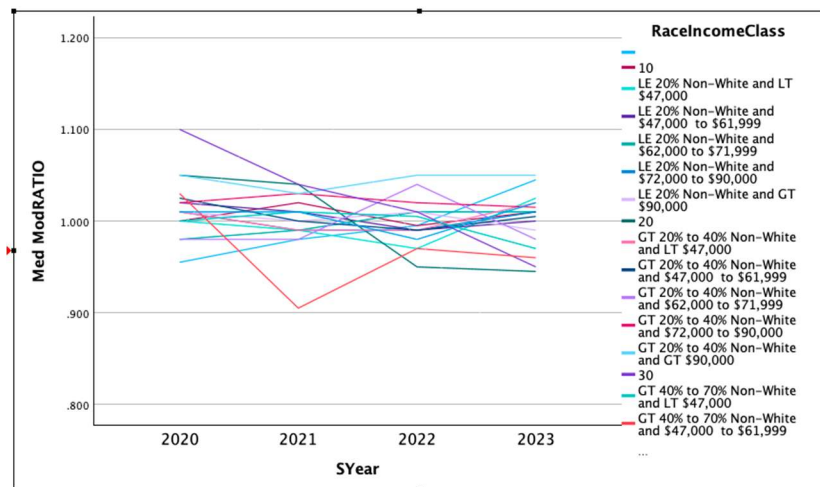


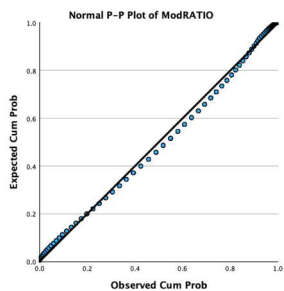
Figure 13.8.8

A year-by-year line chart by Race and Income Class shows some variance, but not systemic overassessment of non-white lower income populations.

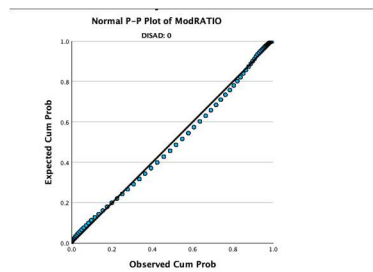
RaceIncomeClass * MRATIOCLASS Crosstabulation		MRATIOCLASS						Total
		0	1	2	3	4	5	
RaceIncomeClass	LE 20% Non-White and LT \$47,000	19	155	79	211	63	157	684
		2.8%	22.7%	11.5%	30.8%	9.2%	23.0%	100.0%
	LE 20% Non-White and \$47,000 to \$61,999	15	194	143	319	126	233	1030
		1.5%	18.8%	13.9%	31.0%	12.2%	22.6%	100.0%
	LE 20% Non-White and \$62,000 to \$71,999	14	407	210	499	225	399	1754
		0.8%	23.2%	12.0%	28.4%	12.8%	22.7%	100.0%
	LE 20% Non-White and \$72,000 to \$90,000	40	261	200	383	154	306	1344
		3.0%	19.4%	14.9%	28.5%	11.5%	22.8%	100.0%
	LE 20% Non-White and GT \$90,000	5	260	161	365	164	306	1261
		0.4%	20.6%	12.8%	28.9%	13.0%	24.3%	100.0%
	GT 20% to 40% Non-White and LT \$47,000	0	85	61	115	58	88	407
		0.0%	20.9%	15.0%	28.3%	14.3%	21.6%	100.0%
	GT 20% to 40% Non-White and \$47,000 to \$61,999	0	47	49	84	36	54	270
		0.0%	17.4%	18.1%	31.1%	13.3%	20.0%	100.0%
	GT 20% to 40% Non-White and \$62,000 to \$71,999	2	47	43	71	33	64	260
		0.8%	18.1%	16.5%	27.3%	12.7%	24.6%	100.0%
	GT 20% to 40% Non-White and \$72,000 to \$90,000	0	33	34	68	30	56	221
		0.0%	14.9%	15.4%	30.8%	13.6%	25.3%	100.0%
	GT 20% to 40% Non-White and GT \$90,000	0	49	53	150	74	150	476
		0.0%	10.3%	11.1%	31.5%	15.5%	31.5%	100.0%
	GT 40% to 70% Non-White and LT \$47,000	0	19	18	38	16	17	108
		0.0%	17.6%	16.7%	35.2%	14.8%	15.7%	100.0%
	GT 40% to 70% Non-White and \$47,000 to \$61,999	0	9	8	14	3	9	43
		0.0%	20.9%	18.6%	32.6%	7.0%	20.9%	100.0%
	GT 40% to 70% Non-White and \$62,000 to \$71,999	0	17	18	31	17	28	111
		0.0%	15.3%	16.2%	27.9%	15.3%	25.2%	100.0%
	GT 70% to 90% Non-White and \$47,000 to \$61,999	0	2	2	2	0	7	13
		0.0%	15.4%	15.4%	15.4%	0.0%	53.8%	100.0%
Total		95	1647	1133	2489	1056	1953	8373
		1.1%	19.7%	13.5%	29.7%	12.6%	23.3%	100.0%

Figure 13.8.9

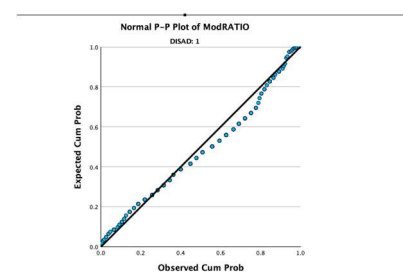
Examining the distribution of errors also shows that overassessment may occur in the block group with the highest non-white population.



Aggregate plot for the county



Plot for Advantaged communities



Plot for Dis-advantaged communities

Figure 13.8.10

When the plots for advantaged vs disadvantaged communities are compared, both will be similar to one another, as seen in figure 13.8.10.

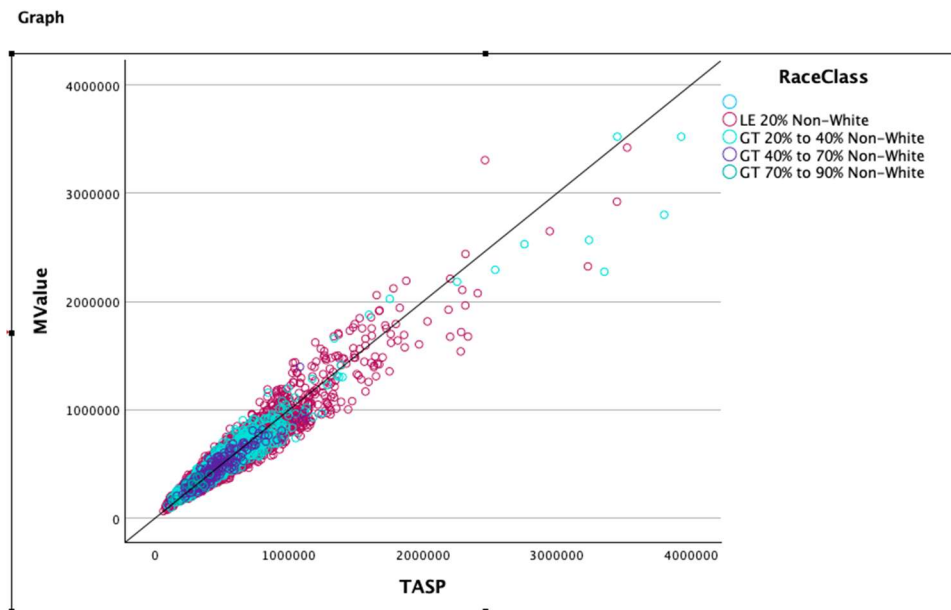


Figure 13.8.11

This scatterplot anticipates marked improvement over the current set of assessments. Points are fairly close to the fit line throughout the price spectrum, with points of all colors both above and below the fit line.

13.9 Ratio Study Conclusions

After adjusting prices for time and removing outliers, the ratio study for the current set of assessments (set 6) shows

- The level of assessment is low for all groups of properties when stratifying by Price Class; Community; or Race and/or Income class. No strata are overvalued, although disadvantaged communities are slightly more undervalued than other communities. Wealthy, mostly white communities are not assessed at lower levels than other communities.
- No overall indication of vertical inequity as measured by either the PRB or PRD.
- Horizontal equity as measured by COD is good for all strata. No strata fall outside of the IAAO performance standard.
- Errors are randomly distributed and do not indicate systemic bias.
- Prices are rising at higher rates in non-white lower income communities. This may be indicative of the effects of gentrification in those communities.
- Normal degrees of variance across various strata.

14.0 Representation

Whenever we use ratio studies to analyze assessment performance, or use sales-based methods to estimate property value, we are assuming that properties that sell are similar to properties that do not sell and that representation of unsold properties is proportionate with sales activity.

Is it safe or reasonable to make these assumptions? How can we test the validity of these assumptions?

In my experience, all real estate markets have subsets of properties or submarkets that are not represented by sales. Many properties in disadvantaged communities or properties that are not “typical” are not represented by sales, which can easily lead to errors in valuation and/or analysis. One of the areas that I had to model in Philadelphia had a small number of properties that were in poor condition or vacant and abandoned. There were no sales of those properties, so we could not directly model an adjustment coefficient for them. Neither could we treat them as “average” condition properties.

These properties would not be represented in a ratio study, so how can we know if the values are fair? We must go beyond examination of sales and consider the degree to which all properties are adequately represented in the analysis. A representation study can identify properties that are not directly represented by sales. Note that a property’s status as unrepresented does not mean that the valuation process cannot estimate a value – only that the model(s) must generalize to a higher degree. There is less specificity and more ‘guesswork’ required in the estimation of values.

14.1 Group Summary Method

I conducted a representation study using the Keene Group Summary Method. This method creates groups of comparable properties and summarizes data about each group. Groups are created by combining Location; Building Type; Quality of Construction; Era Built; Buildings Size Category; Condition of Improvements and a SubGroup code that recognizes any special circumstance that needs to be considered.

Group Ids have been built for all residential properties and for each transaction in the sales file, using attributes as of the time of sale.

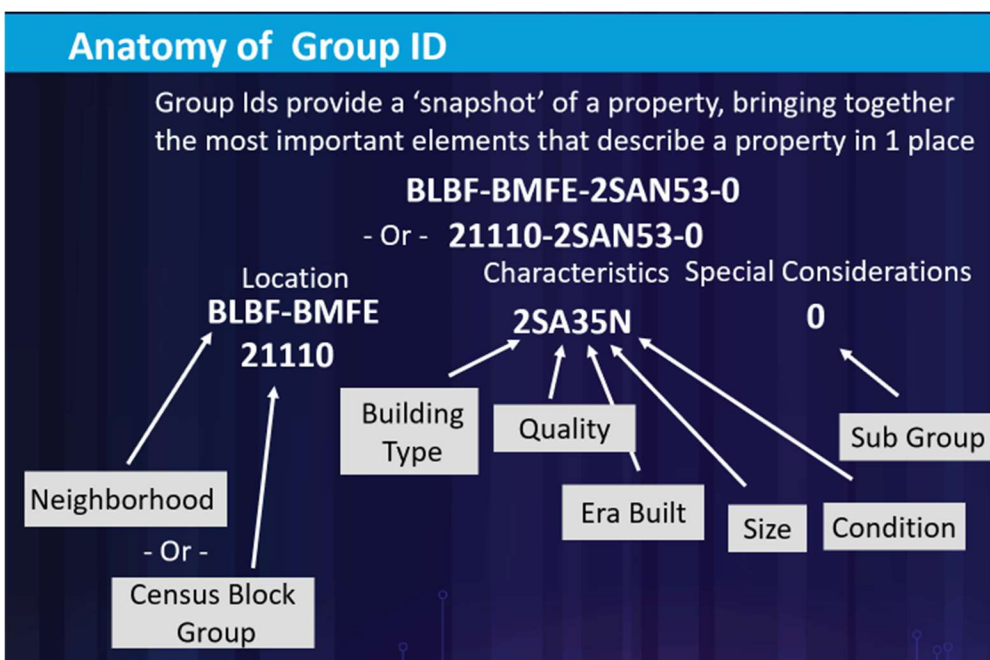


Figure 14 Anatomy of a Group ID

Group Ids allow us to designate properties as members of groups and:

- Make decisions at the group level. This ensures that all properties in the group are affected equally.
- Allow us to have different methods, adjustment coefficients and techniques for different groups of properties.
- Keep aggregate or summary data for all groups and easily publish that data to the world.

- Compare sales to unsold properties to understand representation
- Precisely identify properties that are not represented by sales
- Aid in review of market values

Properties will not be proportionately represented by sales, as sales may represent different numbers of accounts. Many groups of properties may be represented by few or no sales.

I tested using the 2,600 neighborhood codes and also using the 168 Census block groups as the location element. Using Neighborhoods resulted in the creation of 40,082 groups. Using Census Block Groups resulted in the creation of 28,690 groups.

There were simply too many groups that were unrepresented using the 2,600 neighborhoods. I decided to use the Group IDs that used Census Block Groups for this study. Even so, almost 74% of the groups, which include 49% of the properties, are not directly represented by at least one sale. We can see that the assumption that properties that sell represent all of the unsold properties is just *wrong*. We cannot assume that ratio studies actually reflect assessment performance for all properties.

Here are the representation statistics:

GroupID Summaries	Groups	Accounts	Sales	Pct of Groups	Pct of Accounts	Pct of Sales	Representation Pct
Number of Groups	28,690	98,177	15,848	100.0%	100.0%	100.0%	16.1%
Groups with >100 accounts	4	503	107	0.0%	0.5%	0.7%	21.3%
Groups with 50 or more accounts	88	5,888	992	0.3%	6.0%	6.3%	16.8%
Groups with 10 or more accounts	1,978	39,748	5,944	6.9%	40.5%	37.5%	15.0%
Groups with 3 or less accounts	23,121	31,593	5,807	80.6%	32.2%	36.6%	18.4%
Groups with 1 account	16,705	16,705	3,064	58.2%	17.0%	19.3%	18.3%
Groups with 50 or more sales	5	451	281	0.0%	0.5%	1.8%	62.3%
Groups with 9 or more sales	184	5,651	2,733	0.6%	5.8%	17.2%	48.4%
Groups with 3 or more sales	1,469	21,787	7,991	5.1%	22.2%	50.4%	36.7%
Groups with at least 1 sale	7,484	49,850	15,848	26.1%	50.8%	100.0%	31.8%
Groups with no sales (Unrepresented)	21,206	48,327	-	73.9%	49.2%	0.0%	0.0%
Renovated	3,103	5,690	2,003	10.8%	5.8%	12.6%	35.2%
Good	4,444	10,263	3,116	15.5%	10.5%	19.7%	30.4%
Normal	16,466	71,325	10,533	57.4%	72.6%	66.5%	14.8%
Fair	2,036	2,928	142	7.1%	3.0%	0.9%	4.8%
Poor	942	1,141	44	3.3%	1.2%	0.3%	3.9%
Unsound	238	263	10	0.8%	0.3%	0.1%	3.8%

Figure 14.1 Group ID statistics

14.1 Group Summaries

After building the Group IDs, I summarized the groups and created a report that compares sales to the unsold inventory in terms of the central tendency and minimum, maximum and range for Market Values; Time Adjusted Prices; Rate per Square Foot of improvements and Building Sizes. Here is a small sample, which shows 6 groups from Shiloh / Sweeten Creek, of this report:

Group Summary Report										
Community	Accounts	Avg Mkt Value	Min Mkt Value	Max Mkt Value	MV per BldSf	Min / Max MV per Sf	Avg BldSf	Min / Max BldSf		
Groupid	Sales	Avg TASP	Min TASP	Max TASP	TASP per BldSf	Min / Max TASP per Sf				
SHILOH / SWEETEN CREE	519	Groups	2243	Accounts	381	Sales				
SHILOH / SWEETEN C	28	\$255,361	\$102,200	\$423,100	\$178.23	\$60.98	\$252.45	1,433	1,273	1,676
200042SC53N0	8	\$280,512	\$233,669	\$311,652	\$203.20	\$182.51	\$298.30	1,381	1,320	1,452
SHILOH / SWEETEN C	26	\$228,142	\$191,000	\$285,400	\$212.59	\$166.09	\$276.55	1,073	912	1,260
21021RaC22G0	7	\$278,448	\$245,302	\$325,719	\$217.93	\$186.81	\$375.00	1,278	912	1,972
SHILOH / SWEETEN C	51	\$204,547	\$145,500	\$320,700	\$190.54	\$143.48	\$307.14	1,074	912	1,260
21021RaC22N0	7	\$215,708	\$151,732	\$277,274	\$163.93	\$113.36	\$304.17	1,316	924	2,073
SHILOH / SWEETEN C	11	\$255,145	\$219,700	\$288,400	\$175.58	\$144.85	\$208.10	1,453	1,320	1,595
21021RaC23G0	4	\$236,242	\$205,671	\$256,919	\$168.26	\$152.03	\$250.00	1,404	1,320	1,526
SHILOH / SWEETEN C	11	\$230,764	\$188,100	\$324,300	\$220.83	\$184.67	\$262.38	1,045	912	1,236
21021RaC32G0										
SHILOH / SWEETEN C	33	\$203,309	\$147,900	\$262,200	\$203.69	\$162.17	\$252.85	998	912	1,248
21021RaC32N0	2	\$238,208	\$227,557	\$248,858	\$172.86	\$137.70	\$294.12	1,378	1,122	1,634

Figure 14.1.2 Group ID report sample

Group 20042SC53N0 – a group of 28 Large Two-story residences of average quality, built between 1965 and 1985 and in average condition – appear to be well represented by 8 sales. The range in both market value (\$102,000 to \$423,100) and Market Value per Square foot (\$60.98 to \$252.45) appear wide, suggesting that there may be some flawed attribute data within the group. Overall, the group appears to be slightly undervalued.

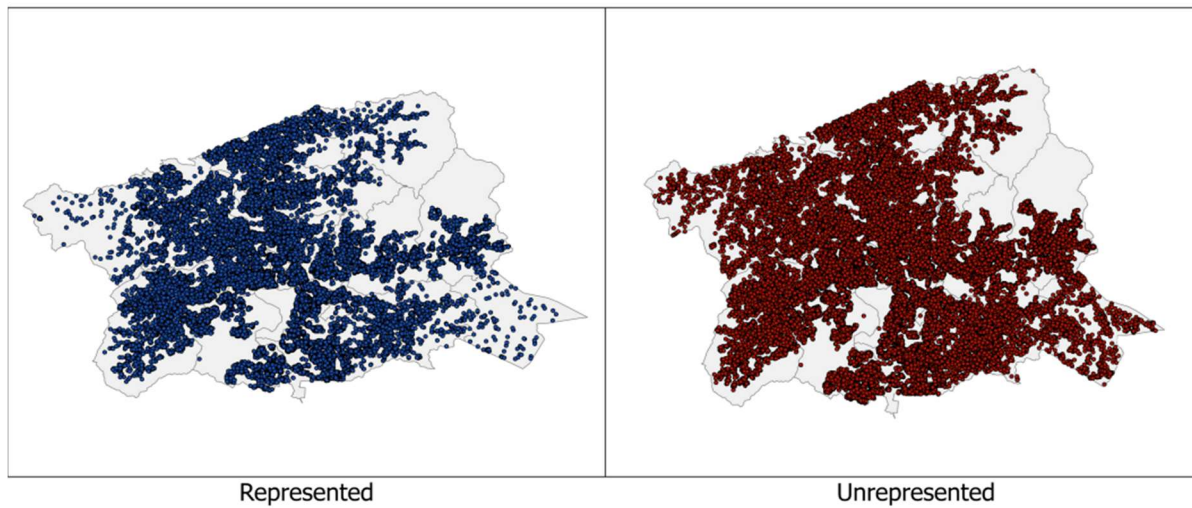
The other five groups in the sample are all Average quality Ranch houses in the same Census Block Group. These groups are all different in terms of size, age and condition. The difference in good vs normal condition is reflected in the higher values in 21021RaC22G0 vs 21021RaC22N0. The larger houses in 21021RaC23G0 have higher values than those in 21021RaC22G0. There are no sales for the 11 houses in 21021RaC32G0, but the values are in line with 21021RaC22G0 – smaller houses in the same condition - and also with 21021RaC32N0, which are the same size houses but in Normal instead of Good condition.

The data in this report can easily be stored as a table, and exposed on the Assessor's website as a resource for homeowners to better understand the accuracy and fairness of their assessments. An address can be linked to its Group ID and the summary for that group and other closely related groups can be displayed for homeowner. One can also drill down to see all of the properties in the group and all of the qualified sales for the group. This can improve transparency for taxpayers.

Recommendation: Incorporate Group Summaries into market value review and as an online information resource for constituents.

We can now identify every property that is not represented by at least one sale. We can also examine the distribution of represented or unrepresented accounts to better understand the kinds of properties about which a ratio study will tell us little or nothing.

Buncombe County Represented vs Unrepresented Properties

*Map 14.1 Properties that are represented or unrepresented by sales*

Side by side comparison of represented to unrepresented properties shows that unrepresented properties are found everywhere in the county. Sandy Mush and Broad river have many neighborhoods that are not represented.

Community * Represented2 Crosstabulation				
Community		Represented2		Total
		No	Yes	
Community	Count	21	0	21
	% within Community	100.0%	0.0%	100.0%
BILTMORE	Count	396	262	658
	% within Community	60.2%	39.8%	100.0%
BROAD RIVER	Count	802	385	1187
	% within Community	67.6%	32.4%	100.0%
CANDLER	Count	1890	1101	2991
	% within Community	63.2%	36.8%	100.0%
CBD	Count	569	1	570
	% within Community	99.8%	0.2%	100.0%
EAST ASHEVILLE	Count	2953	3027	5980
	% within Community	49.4%	50.6%	100.0%
EAST BUNBOMBE	Count	19	8	27
	% within Community	70.4%	29.6%	100.0%
EAST BUNCOMBE	Count	3419	2798	6217
	% within Community	55.0%	45.0%	100.0%
ENKA	Count	2524	3115	5639
	% within Community	44.8%	55.2%	100.0%
FAIRVIEW	Count	1347	1070	2417
	% within Community	55.7%	44.3%	100.0%
FRENCH BROAD	Count	1108	1259	2367
	% within Community	46.8%	53.2%	100.0%
IVY	Count	1323	576	1899
	% within Community	69.7%	30.3%	100.0%
LEICESTER	Count	3071	2296	5367
	% within Community	57.2%	42.8%	100.0%
MONTFORD	Count	600	474	1074
	% within Community	55.9%	44.1%	100.0%
NORTH ASHEVILLE	Count	3466	2806	6272
	% within Community	55.3%	44.7%	100.0%
NORTH BUNCOMBE	Count	1414	1488	2902
	% within Community	48.7%	51.3%	100.0%
NORTH WEST ASHEVILLE	Count	2348	2268	4616
	% within Community	50.9%	49.1%	100.0%
OAKLEY	Count	654	1168	1822
	% within Community	35.9%	64.1%	100.0%
REEMS CREEK	Count	1703	1354	3057
	% within Community	55.7%	44.3%	100.0%
REYNOLDS	Count	1876	1445	3321
	% within Community	56.5%	43.5%	100.0%
SANDY MUSH	Count	1064	485	1549
	% within Community	68.7%	31.3%	100.0%
SHILOH / SWEETEN CREEK	Count	1202	1317	2519
	% within Community	47.7%	52.3%	100.0%
SOUTH ASHEVILLE	Count	4879	5053	9932
	% within Community	49.1%	50.9%	100.0%
SOUTH WEST BUMCOMBE	Count	13	2	15
	% within Community	86.7%	13.3%	100.0%
SOUTH WEST BUNCOMBE	Count	2824	4164	6988
	% within Community	40.4%	59.6%	100.0%
SOUTHSIDE	Count	593	223	816
	% within Community	72.7%	27.3%	100.0%
SWANNANOVA	Count	3208	2984	6192
	% within Community	51.8%	48.2%	100.0%
WEAVERVILLE	Count	683	1042	1725
	% within Community	39.6%	60.4%	100.0%
WEST ASHEVILLE	Count	1935	4024	5959
	% within Community	32.5%	67.5%	100.0%
WOODFIN	Count	2125	1953	4078
	% within Community	52.1%	47.9%	100.0%
Total	Count	50029	48148	98177
	% within Community	51.0%	49.0%	100.0%

Figure 14.1.3 Representation by Community

Representation varies greatly across communities. Properties in West Asheville are best represented by sales, while those in Southwest Buncombe, Sandy Mush, Ivy and Broad River are the least represented.

RaceIncomeClass * Represented2 Crosstabulation

		Represented2		Total
		No	Yes	
RaceIncomeClass	LE 20% Non-White and LT \$47,000	4836	3571	8407
		57.5%	42.5%	100.0%
	LE 20% Non-White and \$47,000 to \$61,999	6921	6239	13160
		52.6%	47.4%	100.0%
	LE 20% Non-White and \$62,000 to \$71,999	8327	9652	17979
		46.3%	53.7%	100.0%
	LE 20% Non-White and \$72,000 to \$90,000	8804	8068	16872
		52.2%	47.8%	100.0%
	LE 20% Non-White and GT \$90,000	8754	8728	17482
		50.1%	49.9%	100.0%
	GT 20% to 40% Non-White and LT \$47,000	2027	2119	4146
		48.9%	51.1%	100.0%
	GT 20% to 40% Non-White and \$47,000 to \$61,999	1783	1655	3438
		51.9%	48.1%	100.0%
	GT 20% to 40% Non-White and \$62,000 to \$71,999	1713	1499	3212
		53.3%	46.7%	100.0%
	GT 20% to 40% Non-White and \$72,000 to \$90,000	574	1307	1881
		30.5%	69.5%	100.0%
	GT 20% to 40% Non-White and GT \$90,000	1619	2372	3991
		40.6%	59.4%	100.0%
	GT 40% to 70% Non-White and LT \$47,000	1131	385	1516
		74.6%	25.4%	100.0%
	GT 40% to 70% Non-White and \$47,000 to \$61,999	259	224	483
		53.6%	46.4%	100.0%
	GT 40% to 70% Non-White and \$62,000 to \$71,999	731	509	1240
		59.0%	41.0%	100.0%
	GT 70% to 90% Non-White and \$47,000 to \$61,999	306	35	341
		89.7%	10.3%	100.0%
Total		50029	48148	98177
		51.0%	49.0%	100.0%

Figure 14.1.4 Representation by race and income

This table shows that almost 90% of the properties in mostly non-white-middle-income neighborhoods are not represented by sales. Can we draw any valid conclusions about this population from ratio studies?

ValueClass * Represented2 Crosstabulation

			Represented2		Total
			No	Yes	
ValueClass	Below 120k	Count	7288	2777	10065
		% within ValueClass	72.4%	27.6%	100.0%
	120k to 175k	Count	6123	3648	9771
		% within ValueClass	62.7%	37.3%	100.0%
	175k to 215k	Count	4963	5088	10051
		% within ValueClass	49.4%	50.6%	100.0%
	215k to 250k	Count	4651	5866	10517
		% within ValueClass	44.2%	55.8%	100.0%
	250k to 282k	Count	3883	5585	9468
		% within ValueClass	41.0%	59.0%	100.0%
	282k to 322k	Count	4363	5833	10196
		% within ValueClass	42.8%	57.2%	100.0%
	322k to 374k	Count	4643	5329	9972
		% within ValueClass	46.6%	53.4%	100.0%
	374k to 460k	Count	4791	5289	10080
		% within ValueClass	47.5%	52.5%	100.0%
	460k to 640k	Count	4820	5063	9883
		% within ValueClass	48.8%	51.2%	100.0%
	640k+	Count	4504	3670	8174
		% within ValueClass	55.1%	44.9%	100.0%
Total	Count	50029	48148	98177	
	% within ValueClass	51.0%	49.0%	100.0%	

Figure 14.1.5 Representation by Value Class

Figure 14.1.5 shows that the lowest rates of representation are in the lowest and highest prices classes. This is largely due to the non-homogenous inventory in those price ranges.

Condition * Represented2 Crosstabulation				
		Represented2		Total
		No	Yes	
Condition	Fair	2775	201	2976
		93.2%	6.8%	100.0%
	Good	4923	5871	10794
		45.6%	54.4%	100.0%
	Normal	36784	39281	76065
		48.4%	51.6%	100.0%
	Poor	1102	52	1154
		95.5%	4.5%	100.0%
	Renovated	3020	2737	5757
		52.5%	47.5%	100.0%
	Unsound	260	6	266
		97.7%	2.3%	100.0%
Total		50029	48148	98177
		51.0%	49.0%	100.0%

Figure 14.1.6 Representation by condition

Of the 98,177 residential properties, only 4,396 (4.5%) are listed as being in less than average condition. In reality, there are probably many more that have not been observed and are inaccurately listed and valued as average or better condition properties. All such properties will be overvalued.

Disad * Represented2 Crosstabulation					
		Represented2			
			No	Yes	Total
Disad	0	Count	48333	47504	95837
		% within Disad	50.4%	49.6%	100.0%
	1	Count	1696	644	2340
		% within Disad	72.5%	27.5%	100.0%
Total		Count	50029	48148	98177
		% within Disad	51.0%	49.0%	100.0%

Figure 14.1.7 shows that properties in disadvantaged communities are much less likely to be represented by sales.

Figure 14.1.7

14.2 Conclusions from the Representation Study

By associating properties with groups of similar residences, we are able to gain insight into the number and types of properties that are not represented by sales. We are able to precisely identify 48,148 residences, 49% of the inventory, as unrepresented by at least one sale between January of 2020 and December of 2023. Ratio studies alone tell us little or nothing about these properties. Producing summaries about groups of accounts allows us to compare the values of properties in unrepresented groups to those that are represented to determine the degree to which those values are reasonable.

Examining the distribution of unrepresented properties, we see that there is much variance between communities; value classes; condition of improvements and racial and income disparity. Lower than average condition properties, properties in the lowest and highest values classes, and disadvantaged communities are all significantly less represented than other properties. We cannot assume that market behavior is constant across all sub-markets or that the level of assessment

and assessment equity are revealed through ratio statistics. Consideration of representation should be an integral part of the valuation process going forward.

15.0 Sub-System Analyses

An important component of this study was the deconstruction of each sub-system of the valuation process to identify possible entry points for bias.

15.1 Sales Validation

If the county is determined to use the sales approach as part of the valuation process, sales validation will become a more critical activity in the Assessment office.

Sales validation consists of two parts: coding transactions as either valid or invalid, and capturing the characteristics of a property at the time that it was sold. The purpose of a robust sales validation process is to create a pool of sales that are good indicators of the value of similar properties. This goes beyond a simple determination of a transaction's status as 'arm's length'. Sales validation should eliminate bids; estate sales; sales between related parties; sales to predatory speculators; and sales where either party is not typically motivated or under duress.

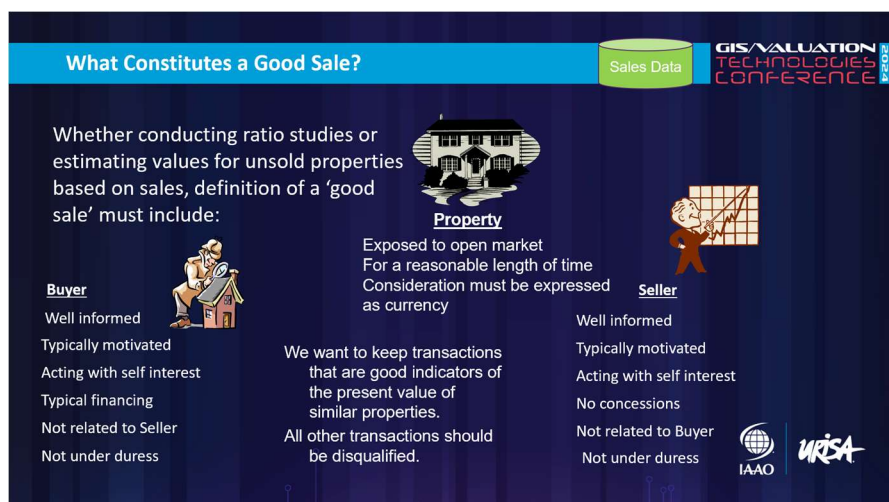


Figure 15.1 This slide from my presentation on Assessment Equity illustrates the requirements for sales validation.

Transactions are transmitted by the Department of Records and processed and entered into the CAMA system by the GIS unit. This process is incredibly efficient. Many offices suffer from delays in receiving sales information, which cause 'lag' in validating transactions. During my visit to the assessment office, one transaction that was known to have closed on Wednesday afternoon was processed and in the system by noon the following day.

Sales validation is assigned to one full-time employee who is assisted by one of the appraisers part-time. The office validates approximately 5,000 transactions in a typical year. Validators reference records from the MLS; Zillow; Redfin and other websites that publish sales information to verify and update attributes at time of sale and to determine if the conditions of the sale, especially in cases of very high or low prices, constitute 'arm's length' activity. As noted above, determination of a sale as an indicator of the value of comparable properties requires the validator to go beyond the simple standard of 'arm's length'.

It must be recognized that there is an inherent bias in this process, which works well for mid to high-end transactions, but not for low-end transactions. Many sellers in disadvantaged communities or low-end transactions do not engage real estate brokers, so those transactions will not be reviewable using those resources. The disqualifications as outliers by price class (section 12.2) demonstrate how much more non-market activity takes place in the highest and lowest price classes.

Recommendation: Revise the definition of valid transactions to include only transactions that are indicators of the value of comparable properties.

Transactions that represent predatory speculation should be invalidated. The speculator's profit margin is usually a function of how much below market value they are able to acquire the property, so they do not represent typical market activity. These can be identified by creating a table of buyer's whose transactions typically do not represent normal market activity and matching them with reported transactions.

Recommendation: Create an Owner filter table to identify and possibly invalidate sales to entities that do not represent typical market activity.

Buyers that are coming from outside of the area may represent another source of atypical market activity. These transactions should not automatically be invalidated, but should be identified for closer examination.

This is an entry point for Bias

Failure to invalidate transactions that do not represent typical market activity invites bias in undervaluation of high-end properties and overvaluation of low-end properties.

Recommendation: Create a process to identify transactions that involve out-of-market buyers.

Recommendation: Expand the Sales Validation Unit to at least two full time employees.

15.2 Property Data Collection

The ways in which property data is collected, updated and maintained is a common entry point for bias.

Buncombe County uses GIS to manage and maintain the parcel fabric, and this process is both effective and efficient.

They make extensive use of aerial and street level photography to conduct reviews of properties from the desktop, which saves time and allows for viewing properties from angles and perspectives that cannot be seen from the street.

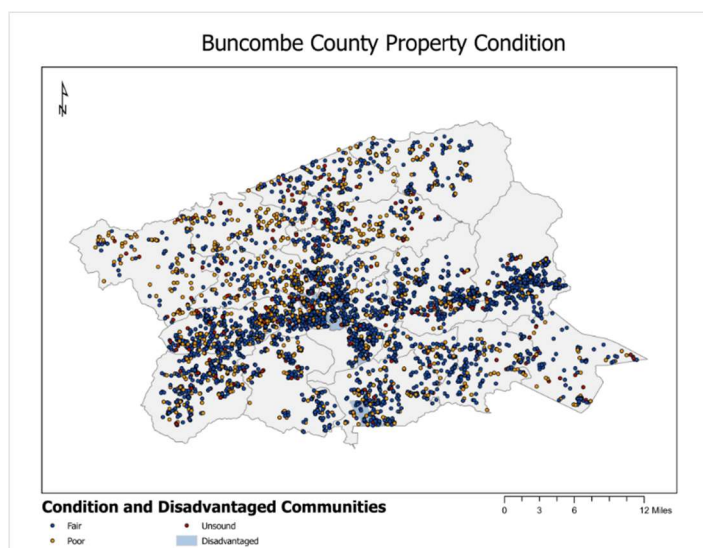
The department relies on several methods of 'self-reporting' for taxpayers to inform them if the property data is inaccurate. One problem is that many constituents in disadvantaged communities do not trust government and will not reach out to or contact the Assessor. The county has an excellent and progressive communications and outreach program to encourage interaction, but the most at-risk population are the least likely to take advantage.

The Assessment office has workflows that trigger field visits to properties when a permit is approved; when a property is sold or transferred; when there is an inquiry, complaint or appeal or when there is a parcel split or consolidation. This means that they get out and get 'eyes on' a property when it is flagged by some activity. Unfortunately, they do not have

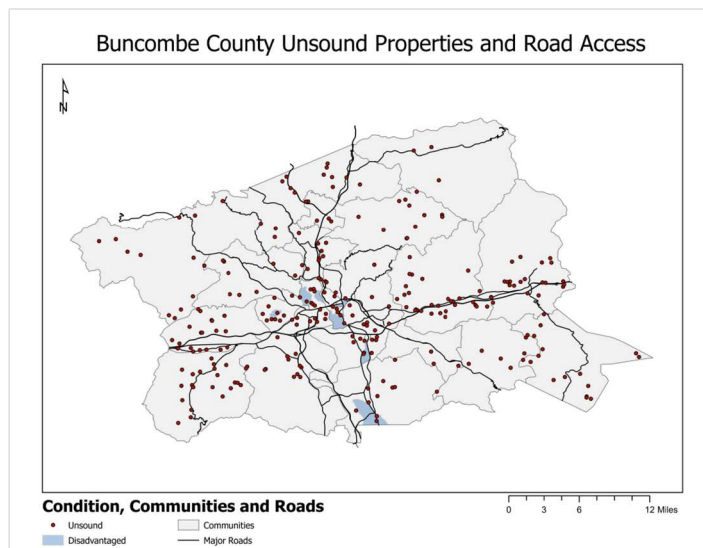
workflows that trigger field visits when properties fall into the cycle of decline, or when improvements are made without permits. This is much more common in lower-income neighborhoods.

During my driving tour of the county, I carried a printout of all of the residential properties that were listed as in poor or unsound condition. As we drove, we sampled the validity of the data by observing the properties that we passed. We found significant rates of error in both directions. We observed properties that were in poor or unsound condition, but were not listed as such in the system. We also observed properties that were listed in poor or unsound condition that had been renovated, were in the process of renovation or where the building had been razed.

Examination of the distribution of condition codes among unsold properties reveals that there is a large imbalance. The vast majority of properties are listed as in 'Normal' or better condition. Of the 98,177 residential properties, only 4,396 (4.5%) are listed as being in less than normal condition. In reality, there are probably many more that have not been observed and are inaccurately listed and valued as average or better condition properties. All such properties will be overvalued. We would expect to see greater concentrations of these properties in the disadvantaged neighborhoods. Map 15.2.1 shows the location of all residences that are listed in fair, poor or unsound condition.



Map 15.2.1 Properties that are listed in fair, poor or unsound condition



Map 15.2.2 Unsound properties and proximity to roads

Map 15.2.2 shows the location of all properties listed in unsound condition and their proximity to roads. Many of these will be observed while the appraiser is en route to other inspections. How many that are not near major or secondary streets go unobserved?

The County appears to have good data quality for the properties that have sold. It is the data for the unsold properties that is an entry point for bias. Errors in the coding of condition of improvements will directly cause overvaluation when properties in fair, poor or unsound condition are valued as average, and cause undervaluation when properties that are in above average or renovated condition are valued as average. This bias will not run along demographic lines, but will affect all properties that are mis-coded.

As the quality and availability of remote imagery improves, more jurisdictions are relying more on desktop observation and data review than less on field observations. This trend has a couple of unfortunate consequences. Remote observation leads to a myopic focus on specific properties. When assessors make observations onsite or in the field, they

see more than specific properties. They can see if general conditions in the neighborhood(s) are improving or declining; how properties other than the subject property are faring. Field visits are the only way to observe properties that have fallen into the cycle of decline.

IAAO recommends that every property should be the subject of a field inspection every four to six years. The Assessor's office lacks the manpower to perform routine field inspections. Many of the properties that will be reappraised for 2025 will not have had the benefit of a field visit.

This is an entry point for bias

Recommendation: Increase capacity in the Assessor's office to allow for a relisting of attributes and periodic field inspections on a regular cycle.

This may not require long-term full-time employees. This might be accomplished with short-term staff augmentations or using interns.

15.3 Neighborhood Definitions and Delineations

The Buncombe County Assessor's office uses a system of over 2,600 custom defined areas that they term 'neighborhoods'. The areas are drawn to the parcel level - as opposed to drawing the lines at the street level - so that properties facing one another across a street will usually be in the same neighborhood. This concept allows for a lot of precision in defining location. It also has the advantage of being easy to review and modify as the market changes.

The office uses one set of definitions and one map layer for all classes of property. This poses some problems, as the boundaries that define location are probably different for office buildings than for industrial properties or apartments or residential properties.

Recommendation: Each property class should have its own set of location definitions.

With only 98,000 residential properties, the average number of properties in a neighborhood is just under 40. Some neighborhoods contain fewer than 10 properties. This is too granular to provide for meaningful levels of activity in many neighborhoods. Most of the neighborhoods that I observed were not homogenous, and contained properties that varied in size, age design and quality. Many of the neighborhoods try to define groups of comparable properties, a task that is far better accomplished by using attribute defined groupings within neighborhoods.

In other cases, a neighborhood is defined to capture a spatial relationship, such as proximity to a golf course, a task that is better accomplished by using spatial attributes in a regression model, which will not only determine significance, but will also determine the distance at which the attribute becomes significant.

Recommendation: Use spatial attributes to capture key relationships between parcels.

In the current system, whenever a new home is built on an existing vacant lot in the neighborhood the comparability that was defined no longer exists. The office is constantly carving out new neighborhoods within the existing schema.

During my visit to Asheville at least three new neighborhoods were created. The office uses sales of vacant land within the defined neighborhoods to set land rates. Most of the neighborhoods do not have enough land sales. Those neighborhoods get combined with other similar neighborhoods to set the land rates.

Recommendation: Change the definition of ‘neighborhood’

I suggest using this definition: A neighborhood is an area within which parcels with similar characteristics will sell for similar prices. It is not necessary for all properties within a neighborhood to be similar. This would support the assignment of land rates, but also greatly reduce the number of required neighborhoods.

Many of the currently defined neighborhoods lie within the Census Block Group boundaries. I do not recommend using Census Block Groups as neighborhoods. They are defined by demographics, and using them would introduce demographics into the valuation process. However, in Buncombe County many of the Block Group boundaries run along arterial streets or natural features like rivers, creeks or mountain ridgelines. In some cases, the neighborhood boundaries cross Block Group lines, which prevents those neighborhoods from being demographically defined. I suggest eliminating many of the ‘micro’ neighborhoods by combining similar neighborhoods, with the Census Block Group boundaries used as the highest level of such combinations.

15.4 Valuation Process

There is a general perception that the county uses sales in the valuation process that determine market values. This is not actually the case. Sales are used in the ratio studies that compare prices to values, but do not *directly* enter into the valuation process. Sales are a mirror that reflects value, but does not determine value.

The county uses a modified cost approach to determine Market Values. This method is used by many assessment jurisdictions across the country. This diagram visualizes that valuation process:

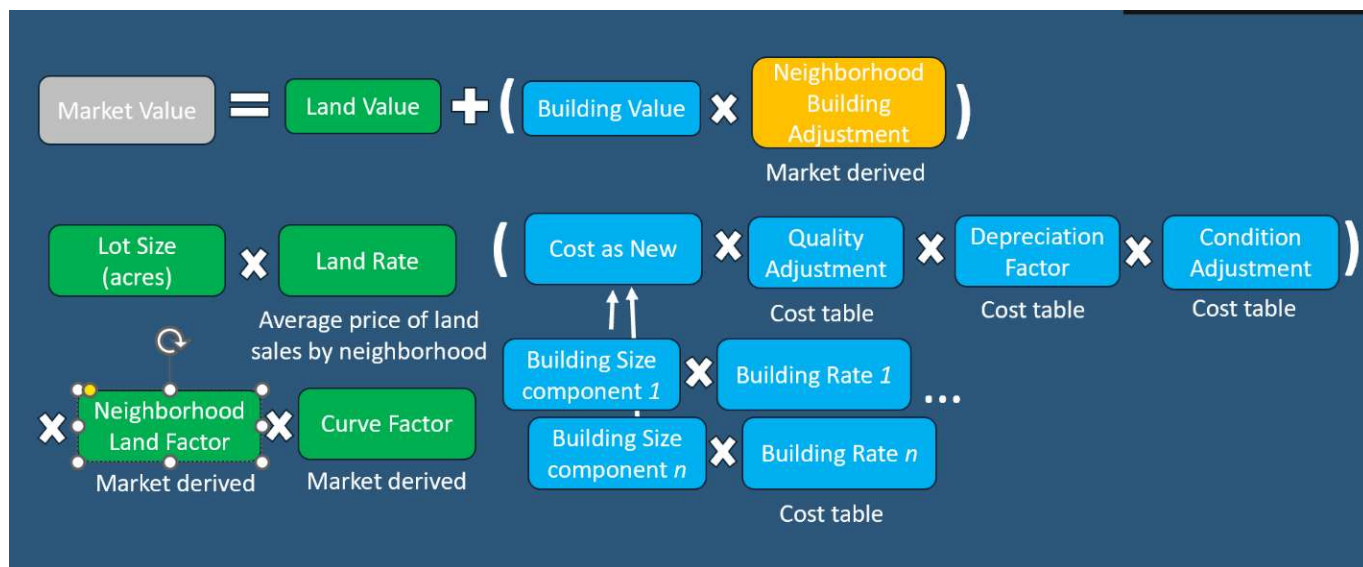


Figure 15.4.1 Modified Cost Approach

Following figure 15.4.1:

Market Value is the value of the land added to the depreciated value of the building.

Land Value is determined by averaging prices for vacant land sales in the neighborhood.

Neighborhoods that have an insufficient number of land sales are combined with similar neighborhoods to develop rates. If there are no similar neighborhoods with land sales, the land rate defaults to an allocation percentage that represents the median allocation percentage for the surrounding neighborhood.

Average land prices are divided by the acreage of the sales to develop the land rates.

A land curve factor is calculated to capture the declining contribution of excess land. The land 'curve' is actually a series of splined linear rates for different size categories that are combined to approximate a curve.

The land rate and curve factors are multiplied by the acreage of all properties.

If the results of that calculation appear to be too high or too low, a neighborhood land adjustment factor can be applied to all properties in the neighborhood. This factor can prevent land values from changing too radically from one reappraisal to the next. This is the second place where sales are used in the process.

On the land side of the equation land sales are used to calculate the rates and the land 'curve' factors.

Building Value is the depreciated value of the Cost of the Building as new.

Cost as New is calculated by adding the cost per square foot of the building to the costs of other components of the building – bathrooms, fixtures, porches etc. These rates come from cost tables that are used throughout the country, modified by factors that adjust for local material costs and labor.

Cost as New is modified by adjustments for the Quality of Construction, the condition of the building and another adjustment for accrued depreciation from all sources to determine the depreciated Building Value. All of the rates on the building side of the equation come from the cost tables.

The Building Value is multiplied by a neighborhood building adjustment factor to bring the entire value into alignment with sales. This is the third point in the process where sales are used.

In the final step Land and Building Values are calculated and added together for all properties in the county.

The important points to consider are that sales only influence the process indirectly, and only by making adjustments to *all* properties in a neighborhood, not to each property individually. At the neighborhood level, values are based on central tendencies, with only lot size, building size, quality of construction and condition of improvements offering degrees of freedom from the central tendency for specific properties.

One of the guiding principles of mass appraisal is that models have to do two things:

1. Produce a strong central tendency and
2. Account for variance from the central tendency.

This method does a good job producing strong central tendencies, but is very limited in creating variance from the central tendency. It will tend to undervalue the best properties in any neighborhood and overvalue the worst properties in any neighborhood. Most of the neighborhoods that I observed are not homogenous. They are a mix of large and small; newer and older; and various designs and styles. Adjustments made at the neighborhood level will tend to over-generalize and introduce errors as properties are less like the 'typical' property.

Where sales are used, they run the risk of not representing unsold properties. If only buyers who can afford to build new houses are buying vacant land, the high prices for those lots will bias land values for *all* properties in the neighborhood, which means that many land values may be biased against the lower value properties. As one of the appraisers realized during our interview session "if only the best properties in a neighborhood are selling, we will overvalue all of the other properties, and if only the worst properties are selling, we will undervalue all of the other properties". Exactly right.

This process is an entry point for bias

Another serious constraint of this process is that it limits the value calculation to the intrinsic attributes of the property – those that exist *within* the parcel boundaries. It does not consider spatial attributes - important relationships *between* properties - such as the distance from desirable or undesirable features in the determination of value.

This is not to denigrate the Buncombe County office. The results of the last two reappraisals demonstrate that the office gets very good results using this method. It is the method itself that has weaknesses that can introduce bias into the assessments.

IAAO recommends using the sales approach for residential properties, with regression models presenting the best embodiment of the sales approach. By way of contrast with the modified cost approach, consider how regression models work.

15.41 Regression models

- deconstruct prices among any number of attributes
- estimate a value for the most typical property (the constant)
- estimate the contributory value of all other attributes and create adjustment factors (coefficients) for each
- apply the constant and adjustment coefficients to unsold properties that have the same attributes to estimate value

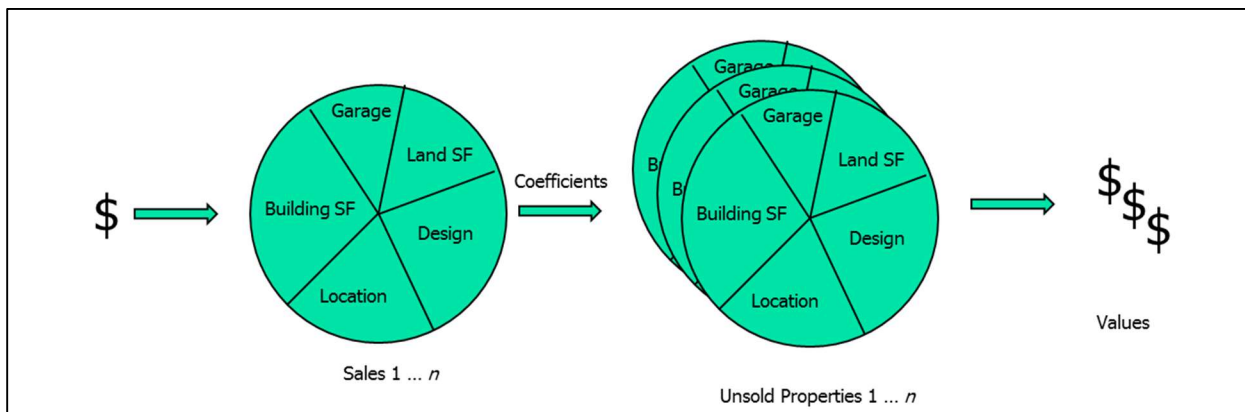


Figure 15.4.2 This diagram illustrates how regression models work

Adjustments are applied, not at the neighborhood level, but to each property. Every attribute in the model presents a degree of freedom away from the central tendency.

Regression models also develop strong central tendencies, but do a much better job of accounting for and explaining variance away from the central tendency.

In preparing this report and analysis I needed to build regression models as mentioned in section **12.3**. I had four reasons to build these models:

1. It was the best way to isolate the effects of time on the market and time adjust sale prices
2. It was the best way to identify and remove outliers
3. It was a test of the viability of the County's use of regression models. It is one thing to want to use regression models. It is another to have the data quality, effective transformations, location delineations and domain

knowledge to build production quality models. My tests indicate that the county would have great success building and using regression models

4. I needed estimates of value that would approximate the results of the 2025 reappraisal. Those values will not be available until November of 2024. I will run analysis on that set of values when they are available, but I needed a set of values to use in the interim

Spatial relationships can be used as attributes in regression models to explain variance within neighborhoods on a property-by-property basis, which is not possible with the current valuation process.

Recommendation: Add sales regression modeling to the valuation process

Recommendation: Add spatial attributes to the valuation process

The Assessor's office has already determined to follow both of these recommendations. It will take at least a year to prototype, test, refine and create models that are production quality. Therefore, there should be no expectation that regression modeling will be part of the 2025 reappraisal.

15.5 Market Value Review

In any mass appraisal environment, the valuation process will produce a significant number of errors. The best models will be accurate to within 10% of the 'true' value between 70 % and 80 % of the time. Without a robust process to review and correct errors in the projected values, many homeowners will receive notices with inaccurate values, which will generate a higher number of complaints and appeals and erode public faith in the valuation process. It is preferable to find and correct those values in advance of sending the assessment notices.

For the 2021 reappraisal, properties with 'unreasonably' high or low values were identified

- By ratio statistics – which only works for properties that sold.
- When changes in value that exceeded a certain percentage. This assumes that the previous value was reasonably accurate.

These methods were used to 'flag' properties for review by the Appraiser of Supervisor.

Improvements to the Market Value review process are being designed and tested for the 2025 reappraisal, including interactive GIS dashboards that use the ratio and change percentage measurements to identify and visualize properties that need review; comparing sale price per square foot to market value per square foot rate for groups of comparable properties and comparing groups of properties with no sales to other groups to see if values are 'in balance' (see section 14.1).

To make this process more efficient, methods should be developed that enable reviewing and revising groups of similar properties, instead of making revisions one property at a time.

Recommendation: Improve tools for reviewing and revising projected values.

15.6 Data Quality Analysis

I ran checks for data quality for both the sales file, which contained 15,848 transactions, and the master inventory file, which contained 98,177 records, for single family residences. I found a relatively small number of records that were missing data in fields that are necessary for valuation. These can be easily corrected by the appraisal or GIS staff.

Missing values

Element	Master	Notes	Sales	Notes
Cblock Group	259	Assign via GIS	7	Assign via GIS
Community	252	Assign via GIS	4	Assign via GIS
Use Class	4		0	
Neighborhood	20	Assign via GIS	4	Assign via GIS
Quality Grade	3554		1	
Property Type	1165		0	
Year Built	1165	100 ; 1192	0	
Total Living Area	675	345 are <200	39	9 are < 200
Condition	1165		0	

*Figure 15.6 Missing data for residential properties***Inaccurate values**

Of greater concern are the unknown number of records that contain valid, but incorrect data. As mentioned in section 15.2, a sampling of condition codes on a driving tour revealed a significant rate of observation errors. The Assessor's office does not have a workflow that supports routine observation of properties that may be in the cycle of declining condition. While a comprehensive field observation is not an option for the 2025 reappraisal one that is limited to the disadvantaged communities, where the owners are less likely to self-report attribute errors to the Assessor, should be considered.

Recommendation: Field-check properties in the 8 Census Block Groups that represent disadvantaged communities to reduce the number of properties that will be overvalued based on condition.

16.0 Bias Analysis

16.1 Indications

Review of data, systems and processes found that the office has no imbedded demographic considerations in their work. Neighborhood definitions are objective and based on data and property attributes.

I found no reliance on vestiges of legacy practice that would generate bias.

I saw no evidence of overt political interference that favors specific neighborhoods or demographic groups.

The Appraisers do not know who owns any given property, so have no way of producing favorable or unfavorable outcomes for specific groups of people.

My review of ratio statistics and error distribution uncovered no evidence of systemic bias.

In essence the office adheres to a 'blind and fair' process that produces objective results. I found no evidence of overt systemic bias in the assessments.

16.2 Sources of Bias

While I did not find any overt or systemic bias in the assessments, sub-system analysis revealed several possible entry points for anecdotal bias.

Neighborhood Definitions

Attempting to use neighborhood definitions to capture groups of comparable properties is problematic because many of the neighborhoods are not homogenous, and the properties that they encapsulate are too varied to establish a common

central tendency. This tends to undervalue the best properties and overvalue the worst properties within each neighborhood. Because this is a local dynamic that happens in neighborhood after neighborhood, the effects are visible to many residents.

Valuation Process

Modified Cost Approach can be biased because it is not *directly* connected to sales. It works best when properties are homogenous and the range of depreciation is not wide. It is difficult to calibrate the depreciation and neighborhood adjustments to fit the variety of sizes, ages, quality, design and condition that are found across the county.

Sales Validation

The sales validation process should go beyond the determination of a sale as an 'arm's length' transaction and invalidate transactions that are not good indicators of the value of similar properties. This means that sales that do not meet tests for typical market activity should be invalidated. This will help dispel the perception that high priced properties are undervalued and that low priced properties are overvalued. Unfortunately, this is a natural consequence of mass appraisal, but good sales validation can help avoid the appearance of rampant or systemic over / undervaluation.

Capturing property attributes as of the date of sale will make ratio statistics much more informative and will bring the county into compliance with a key element of the IAAO standard.

The assessor's office should share the file of validated sales with outside analysts to reduce the possibility of 'false positives' that result from the use of unqualified data.

Field Observations

Inability to identify deteriorating properties causes those properties to be overvalued. The remedy is to have enough appraisers to make periodic routine field observations for all properties possible.

Improvements to these sub-systems will make the entire valuation process more effective.

17.0 Recommendations

17.1 Workforce

Recommendation: Increase the number of permanent appraisal staff to comply with IAAO guidelines. IAAO recommends a parcel to staff ratio of between 2000:1 and 5000:1, depending on how homogenous the inventory; the level of technology and the number of accounts in non-residential property classes. With 133,000 parcels, the office should have between 26 and 66 employees. The ratio of accounts to staff is approximately 5300:1. The high degree of technological capacity provides efficiencies that reduce the total number of recommended staff, but this is countered by the variety and complexity of the inventory and the number of sub-markets. The Assessment office and the County managers should work to arrive at a workforce plan that will realistically provide the Assessment office with the capacity to best serve constituents. County managers are encouraged to consider staff augmentation, not as an expense, but as an investment in constituent services that pays significant dividends in both the short and long term.

Recommendation: Create a Customer Unit to handle complaints and inquiries. Currently these fall to the assigned appraiser and take an unpredictable amount of time away from other work. It is generally more efficient to assign this function to lower-level employees as a specialty. I recommend adding two staff members specifically for this purpose. These people do not need to have the extensive experience of the Appraisers, and could be hired from outside of the Department.

Recommendation: Create a three-person Modeling and Analysis Unit. These positions require extensive domain knowledge and Mass Appraisal expertise. It is very difficult to find these people as external hires. I recommend training and elevating current employees and ‘backfilling’ the positions from which they came. These positions will need to be added to the workforce plan with appropriate pay scales and job titles and descriptions.

Recommendation: Create a specialty for manufactured homes, modular homes and unusual properties. Like luxury homes, these properties require special attention.

Recommendation: Partner with local universities to create an internship program to augment the appraisal staff. The County should consider workforce augmentation using interns to provide lower level, less technical services. Other jurisdictions work with local universities to provide interns to assist with Sales Validation; and Data Collection, Data Validation and Data Quality Control. This can both reduce costs and provide greater flexibility for the county. Students are eager to augment their resumes, and internships can provide paths to permanent higher-level employment.

17.2 Sub-systems

Recommendation: Create a process to identify transactions that involve out-of-market buyers. Predatory speculators and other actors who frequently engage in non-typical market activity can be identified and stored in a table that can be used to filter or flag transactions as they are reported for sales validation.

Recommendation: Identify out-of-county buyers for purposes of sales validation. Buyers with out of state prior addresses can be flagged to support analysis and sales validation for transactions that are subject to external economic influence. *The assessor’s office has already recognized this problem and is developing a process for this.*

Recommendation: Create a specialty role or unit for the valuation of Luxury homes. *The assessor’s office has already recognized this problem and created this role.* Resources should be allocated for a complete data collection and validation project for these properties. This will go a long way toward addressing the under-valuation of high-end properties.

Recommendation: Expand the Sales Validation Unit to at least two full time employees. The validation unit has to review around 5,000 transactions each year. A more robust validation process requires more time and attention be given to each transaction to identify atypical market activity. This is too big a job for the current resource allocation.

Recommendation: Only use sales data that has been validated and where the attributes of the property at the time of valuation are the same as the attributes that were present at the time of sale for ratio studies. The Assessor’s office now keeps this kind of file in the Analysis database and has incorporated capture of attributes at time of sale as into the Sales Validation workflow.

Recommendation: Use regression models to isolate the effects of time in various sub-markets and adjust all prices calibrated to a common target date. Accurate time trending is a requirement for using the sales approach in mass appraisal. This is the most accurate and precise of the commonly used methods and can be adopted by the Assessor’s office with relative ease. The models that I used will be given to the Assessor’s office. These can be updated and maintained for future use.

Recommendation: Make the classification of Rural, Suburban or Urban based on Census Block Groups instead of Communities. Time trending for Rural, Suburban and Urban markets would benefit from a more precise method of classifying these areas. Designating each of the 168 Census Block Groups as one of these classes would improve performance of regression models used to isolate the effects of time.

Recommendation: Increase capacity in the Assessor's office to allow for a relisting of attributes and periodic field inspections on a regular cycle.

Recommendation: Change the definition of 'neighborhood'

I suggest using this definition: "A neighborhood is an area within which parcels with similar characteristics will sell for similar prices. It is not necessary for all properties within a neighborhood to be similar." This would support the assignment of land rates, but also greatly reduce the number of required neighborhoods.

Recommendation: Each property class should have its own set of location definitions. Create separate location layers for residential properties, condos, apartments, office buildings, retail, industrial and vacant land.

17.21 Data Management

Recommendation: Identify Entry Level, Discretionary and Externally Driven sub-markets. If these markets can be identified by some combination of location, price points or property attributes, they can be given consideration in the valuation process. The best solution would need to be researched and tested, but identification is the first step.

Recommendation: Create an Owner filter table to identify and possibly invalidate sales to entities that do not represent typical market activity. Parties that frequently buy or sell properties and whose actions are not typical of the market can be flagged for attention by sales validators. This technique can identify predatory speculators, properties whose attributes may not be correctly captured in the CAMA system and other anomalies in the sales data.

Recommendation: Field-check properties in the 8 Census Block Groups that represent disadvantaged communities to reduce the number of properties that will be overvalued based on condition. A complete re-listing of attributes may not be possible, but validating the condition codes in neighborhoods where properties are more likely to be in the cycle of decline can prevent over-valuation of these properties and improve equity in the large pool of unsold properties. Given that there are a small number of these neighborhoods, it might be possible to validate the data.

Recommendation: Create a workflow to support observation of properties in the cycle of decline. There is a good workflow in place to identify properties that are improved and to capture attribute data about properties as they are sold, but there is no workflow, other than happenstantial observation, to observe and capture data about properties that are not receiving adequate maintenance and have fallen into the cycle of decline.

17.22 Training

Recommendation: Revise the definition of valid transactions to include only transactions that are indicators of the value of comparable properties. The sales validation process should be revised to invalidate transactions that should not be used to indicate the values of comparable unsold properties. This will be helpful for both ratio studies and the valuation process.

17.23 Valuation Methods

Recommendation: Add sales regression modeling to the valuation process. The county can use the models that I built for this body of work as templates for training a modeling team and researching production quality regression models.

Recommendation: Build and maintain machine learning models in-house. The assessment Office is currently contracting a machine learning model through a vendor. These models can be built, maintained and run by trained in-house modelers.

Recommendation: Use spatial attributes to capture key relationships between parcels. Spatial attributes measure distances to features – such as parks, recreation, shopping or nuisances - that effect value. They increase the power of models by explaining variance *within* neighborhoods and allow for greater precision in the valuation process. The Assessor's office has a talented GIS unit that is entirely capable of managing this process.

Recommendation: Add spatial attributes to the valuation process. Once measurements for spatial attributes are made, they can be added to the valuation process to add an entirely new dimension to the assessment process.

17.24 Other

Recommendation: Play informational videos on a loop in the public access areas of the Assessor's office. Visitors to the office can learn about various aspects of the assessment process as they wait for services. These videos should also be available on the County website as part of the public outreach and education effort.

Recommendation: Incorporate Group Summaries into market value review and as an online resource for constituents. The group summaries that are shown in section 14.2 support comparison of market values to time adjusted sales for comparable properties as well as comparison of market values between groups with limited dimensions of difference, such as size class or condition, that are similar, but not completely comparable to a subject property. Users can 'drill down' to see lists of all properties and time adjusted sales that are considered comparable.

Recommendation: Improve tools for reviewing and revising projected values. The Assessor's office uses sampling techniques to review market values. Development of a more comprehensive and robust set of tools is recommended.

Recommendation: Engage with the North Carolina state legislature to expand the options for tax relief for constituents. Like many other jurisdictions across the country, Buncombe County is experiencing a crisis in affordability. Prices continue to rise; outpacing wage increases for many constituents.

18.0 Conclusions

After conducting this extensive body of work, I found

- No evidence of systemic Racial or Income Bias in the performance statistics. I found isolated indications of bias, in favor of or against price classes, condition of improvements and property types, but not in terms of race or income.
- No evidence of overt political interference. Political interference is common in the assessment process. Where it exists, it is often a feature - not a bug. Examining the legacy of practice exposes the roots of such interference, which is then identifiable through a variety of statistical processes. Allegations of bias in assessments frequently imply malfeasance on the part of the jurisdiction. Therefore, this statement is a very important element of this report.

- No evidence of bias in the attitudes of the workforce. Bias is frequently found in the (often unconscious) attitudes of those who work in the system. Examination of workflows and interviews with staff showed no causes for concern, and no support for a bias allegation.
- The appraisal system is overall 'Blind and 'Fair' and does not consider demographics in producing estimates of value. This does not imply that the process is perfect, or without room for improvement.

I found that

- Bias is entering the valuation process through Data Collection; Valuation Process; Sales Validation and Neighborhood Definitions and Delineations. Improvements are needed in those areas and specific recommendations have been made in section 17 of this report.
- Observed bias is not based on race or income, but evident in terms of price points and condition of improvements.
- The Assessment office is understaffed. They are maximizing the use of technology, but the current level of staffing limits the scope of what the office can achieve and needs to be addressed.

It is my opinion that the practice of mass appraisal in Buncombe County is fair and not biased in favor of or against any *demographically* identifiable group. Reports that have been published alleging or supporting allegations of bias suffer from the serious deficiencies enumerated in section 9.1 of this report, rendering them unreliable as credible sources of information.

The perception of bias should be acknowledged and addressed through increased public outreach and education, and encouraging constituents to engage with the Assessment office with both general and specific questions or concerns. Additional transparency regarding the valuation process is recommended, as there are general misconceptions surrounding the methods by which values are determined.

The Buncombe County Assessment office is very progressive and is invested in making improvements to the valuation process and its component sub-systems. They have engaged my services to monitor progress through the 2025 reappraisal and beyond. The County can expect measurable improvement in the quality and equity of assessments.

This concludes my report. Please contact me with any questions or concerns.

Appendix A Common Constituent Questions and Answers

Isn't price the value of a property?

It is important to understand that Price is not the same as Value. In assessment practice, it is commonly understood that Price is a proxy for Value – maybe the best proxy – but only a proxy none the less. Observed price may not conform to the definition of market value if either party is not knowledgeable; under duress; not typically motivated; or if the property is not exposed to an open market for a reasonable period of time. The Principle of Substitution states that a buyer will not pay more for a property than the cost of an equally desirable property. This assumes that equally desirable properties are available. With unique or high-end properties, the lack of supply tends to inflate the price that is ultimately paid. Price becomes biased in favor of the buyer that is willing to pay more than any other competitor, and that price may not be predicated on the attributes of the property and cannot be predicted for another similar property.

There are stakeholders in the county who are recommending simply making the market value of a property equal to the observed sale price. This practice is known in the assessment industry as 'sales chasing' or 'Welcome Neighbor' and its use is strongly discouraged. Value is something that must be predictable through a combination of the attributes of the property and normal activity of buyers and sellers in the market. The distortions that are observed in price relative to value are many. Using Price as the ultimate indicator of Value leads to problems in uniformly estimating Value through an objective and repeatable process.

Another problem with this approach is that only a small percentage of properties will be revalued using this method. In a full reappraisal, 100% of the properties – both sold and unsold – are considered. Given that only about 5% of the properties are sold each year, in a four-year period only about 20% of the inventory would be revalued. It would be very difficult for the County to project and maintain budgets, and could require across-the-board increases in the tax rate to maintain fiscal viability.

Another problem that jurisdictions that have taken this approach have encountered is that it tends to kill the resale market. If your taxes are based on the price you paid many years ago, why would you sell your home and buy another home in the county when your taxes will now be based on a much higher sale price? You would only sell if you were leaving the county. This tends to greatly reduce the number of homes available for purchase, and the limited supply drives up prices, which further restricts the resale market.

Looking at comparable sales doesn't tell me how the assessor arrived at the value. How can I better understand the process? There is a general perception that the county uses sales in the valuation process that determine market values. This is not actually the case. Sales are used in the ratio studies that compare prices to values, and in responding to inquiries, complaints and appeals, but do not *directly* enter into the valuation process. Think of sales as a mirror that reflects value, but does not determine value.

The county uses a modified cost approach to determine Market Values. This method is used by many assessment jurisdictions across the country. The process is discussed in detail in section 15.4 of the report. The important points to consider are that sales only influence the process indirectly, and only by making adjustments to *all* properties in a neighborhood, not to each property individually. At the neighborhood level, values are based on central tendencies, with only lot size, building size, quality of construction and condition of improvements offering degrees of freedom from the central tendency for specific properties.

One of the guiding principles of mass appraisal is that models have to do two things:

1. Produce a strong central tendency and
2. Account for variance from the central tendency.

This method does a good job producing strong central tendencies, but is very limited in creating variance from the central tendency. It will tend to undervalue the best properties in any neighborhood and overvalue the worst properties in any neighborhood. Most of the neighborhoods in the county are not homogenous. They are a mix of large and small; newer and older; and various designs and styles. Adjustments made at the neighborhood level will tend to over-generalize and introduce errors as properties are less like the 'typical' property.

Does the estimated market value change at the same rate for all properties?

No, the market value does not change at the same rate for all properties. There are many markets and sub-markets within the County, any or all of which can change at different rates. The most important point is that when properties are reappraised, market values are projected without regard to the current market value. There are techniques that calculate rates of change based on trending sale prices and apply those rates of change to the current value to estimate a new value, but those techniques are not used in Buncombe County. Change in value is not considered.

Are luxury homes valued in a different way than other homes?

The appraisal process is the same for all residences. The process follows the same steps for luxury homes as it does for other residential properties – the difference is in the data and attributes that are significant in luxury homes versus other residences. One step in the appraisal process includes plus or minus adjustments that may affect the assessed value of a home. Aspects of all properties (such as location, age, topography, etc.) are taken into account during the appraisal of all properties. There are specific adjustments that can be made for features present in a luxury home that may not be present in a standard home, such as renovated fireplaces, elevators, custom designs, materials or other special features.

How are property assessments equitable?

In assessment we consider equity to be a state wherein a group of properties that share a given set of attributes have similar values for tax purposes. The assessment industry has performance measurements and standards that are used to measure the accuracy and equity of property appraisals. These are applied statistics based on the collection and analysis of sales data.

A Ratio Study is a statistical process that compares sales prices to assessed market values. Ratio studies are commonly used to evaluate the health of assessments. For each observation, market value is divided by sale price to calculate the ratio. The resulting ratios are analyzed to calculate the median ratio (the ratio where half of the ratios are higher and half are lower), the mean (average) ratio and the weighted mean (total market value divided by total price) ratio. Of these, the median ratio is typically used to describe the overall level of assessment. In most jurisdictions, median ratios should be close to 1.00 – which indicates that price and value are equal. The industry standard for level of assessment is the median ratio for all classes of property should be between .9 and 1.1. It is of greater importance that median ratios for the inventory when stratified – by location, price class, property type or any other attribute – should be reasonably uniform. If the median ratio for the county is .91, all strata should have median ratios close to .91.

Median ratio tells us about what is typical, but we also examine the degrees to which ratios vary away from the median. Ratios are also analyzed to both vertical and horizontal equity. All properties that sell for the same price should have close to the same assessed value. This is called horizontal equity and there are industry measurements and standards that are applied.

Properties in all price ranges or categories should be assessed at the same level. This is called vertical equity and is also measured in ratio studies.

When assessments are equitable, all classes of property will be assessed at close to the same level, and variance will be within desirable ranges and explainable.

How does the Assessor know if the value is accurate if they do not see the inside of a property?

This is a common problem for all assessors. Not seeing interior of properties presents a challenge for assessors. Most appraisers can only rely on what can be seen ‘from the curb’, although there are sources of property data that can refine observations. These include online resources, fee appraisals, and aerial or street level imagery, all of which are used in Buncombe County. That said, the lack of direct observation often results in inaccurate or incomplete data – especially in the large pool of unsold properties.

The primary goal is to produce estimates of value that are uniform and where variance can be traced back to specific attributes. Accuracy of the estimates of value are an important, but secondary, consideration. The appraiser must use the best data available to estimate value. It is important that property owners review their data and communicate with the appraiser when it is inaccurate. This can be done by returning the post card mailers, through the County website or by contacting the Assessor’s office directly.

Will attribute data be available online?

Property Record Cards (PRCs) will be available online. They will be accompanied by a detailed Schedule of Values (SOV) that will be published to give definitions of the various attributes and data elements. Owners should review these for accuracy and make corrections where needed.

How does my neighborhood affect my property value?

One step in the mass appraisal process is the grouping of neighborhoods with like characteristics (such as geography, age, zoning, school districts, etc.). This allows similar neighborhoods to be compared to each other. From there, a method called neighborhood clustering is used. This means that properties with similar characteristics within those neighborhoods are grouped together. Land values are determined based on land sales within neighborhoods, and possibly modified by a common adjustment factor. Building values are also adjusted by another neighborhood adjustment factor to ‘fine tune’ those values to align with sales.

Using this method, appraisers are able to estimate property values that reflect recent sales data. This results in more accurate and uniform assessments that consider trends in market data.

Does a unique property within a neighborhood influence the market value of other homes?

No. The value of each property is estimated independently based on its land value and (possibly) unique set of building attributes. Properties are not directly compared with one another in the valuation process.

Are assessments based solely on the home or does land size/location factor in?

Land size and location are both factors that influence assessment. There are separate adjustments that include land size, type of land, topography, road frontage, view, and area type (rural, suburban and subdivisions, and urban). Buildings are valued based on the estimated cost to build as new, minus depreciation.

How will I be notified of my 2025 reappraisal value?

A notice of value will be mailed to all Buncombe County real property owners on file with the Buncombe County Assessor's Office on or about Jan. 30, 2025.

Will reappraisal affect my property tax bills?

An increase or decrease in the appraised value of a property may not predict whether your property tax will increase, decrease, or remain the same. Only after the tax rates are set by the Buncombe County Board of Commissioners can the property tax be determined. Tax rates are set by July 1 every year.

What if I disagree with the County's assessed value?

There is an appeal process for property owners that disagree with the appraised value. First, an informal appeal form must be completed and returned to the Assessor's Office prior to April of the year in which the appeal is being made. You may start the process online or call the Assessor's Office at (828) 250-4940 to request a form.

Does the appeal process favor higher value properties? Do higher end properties have more success?

Everyone deserves a fair assessment. Everyone is entitled to appeal a value that does not seem equitable. Each case is heard on its merits. Appeals are heard and resolved by a separate Board and are not part of the Mass Appraisal process. Decisions do not necessarily conform to appraisal logic or methods, and are not made with consideration of uniformity.

In mass appraisal, the most difficult properties for which to accurately estimate values are those in the highest and lowest ends of the value spectrum. A 5% error in million-dollar property is pretty significant and not likely to be ignored. A 10% error in a fifty-thousand-dollar property is less significant, and more likely to go unchallenged. Higher valued properties are inherently more likely to be the subject of an appeal, and also more likely to have a significant error in the estimate of value that merits revision.

Is Property Tax Relief Available

Under specific circumstances, property owners may be eligible for reduced taxes or exclusions due to age, disability, and/or Veteran status. Taxes may be deferred through participation in other deferment or special programs. For more information on elderly, disabled, and disabled veteran relief visit buncombecounty.org/taxrelief.

Does my income affect my value in my residential property?

No. Demographics like race, age, income or educational attainment are not considered in the valuation process. Data about property owners – other than that used to support the Assessors' keeping of public records - is not used for analysis or the estimation of property values. Property owners' income has no influence on the value of the property.

How often is property reappraised in Buncombe County?

North Carolina statute calls for a reappraisal every eight years, or when the yearly reported median ratio falls below 85% or rises above 115%. Buncombe County routinely plans for a revaluation on a four-year cycle. The Assessor is currently conducting a reappraisal for 2025, four years after the last reappraisal in 2021.

Can the county reappraise more often than on a four-year cycle?

There are constituents that are suggesting more frequent reappraisals. Due to the rapid increases in price in almost all submarkets since the last reappraisal, the median ratio has fallen dramatically, meaning that the county is losing potential revenue as the market outpaces assessments.

A reappraisal should not be undertaken if the limitations of the mass appraisal staff do not allow for an effective and reasonably uniform and accurate project. A reappraisal should improve, not degrade, performance. A reappraisal project that makes things worse for constituents should not be undertaken. There must be adequate time between reappraisals to digest the results, answer complaints and appeals, make necessary data improvements, and improve the valuation process so that the next reappraisal project best serves all stakeholders.

Appendix B Ratio Study Separate Doc

Appendix C Disqualification Study Separate Doc

Appendix D Specific References to Published Reports

Appendix E Model Performance Summaries

Maps

Cblock Groups by Race and Income 8.5

Cblock Groups by Disadvantaged 11.1

Qualified / Disqualified Sales 12.2

Sales by Current Price Class 13.6

Sales by Current Ratio Class 13.61

Sales by Current Ratio Class (Fake)13.61

Cblock Groups by Ratio Class 13.62

Sales by Modeled Price Class 13.8

Sales by Modeled Ratio Class 13.81

Cblock Groups by modeled Ratio Class 13.82

Unrepresented Properties 14.1

Represented Properties 14.1

Less than Avg Condition properties 15.2

Unsound Properties 15.2