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 were vacant and/or 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

A representation study was conducted 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 Identifiers (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.

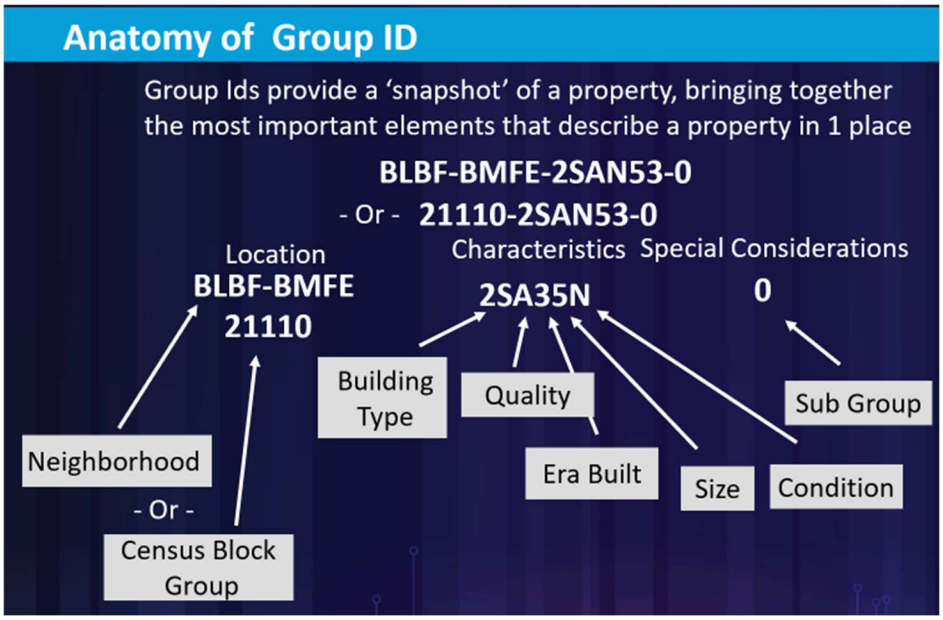


Figure 14 Anatomy of a Group ID

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

- Make decisions at the group level, ensuring that all properties in the group are treated 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 better 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.

Group IDs were built using both the 2,600 neighborhood codes and 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, therefore Group IDs, based on Census Block Groups were used. Even so, almost 74% of the groups, which includes 49% of the properties, are not directly represented by at least one sale. The assumption that sold properties represent all of the unsold properties is just *wrong*. We cannot assume ratio studies actually reflect assessment performance for all properties.
Figure 14.1 shows 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

14.2 Group Summaries

After building the Group IDs, groups were summarized and a report was created, that comparing 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 of this report, showing 6 groups from Shiloh/Sweeten Creek:

Group Summary Report

Community / GroupId	Accounts / Sales	Avg Mkt Value / Avg TASP	Min Mkt Value / Min TASP	Max Mkt Value / Max TASP	MV per BldSf / TASP per BldSf	Min / Max MV per Sf / Min / Max TASP per Sf	Avg BldSf	Min / Max BldSf
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 14.2.1 Group ID Report Sample

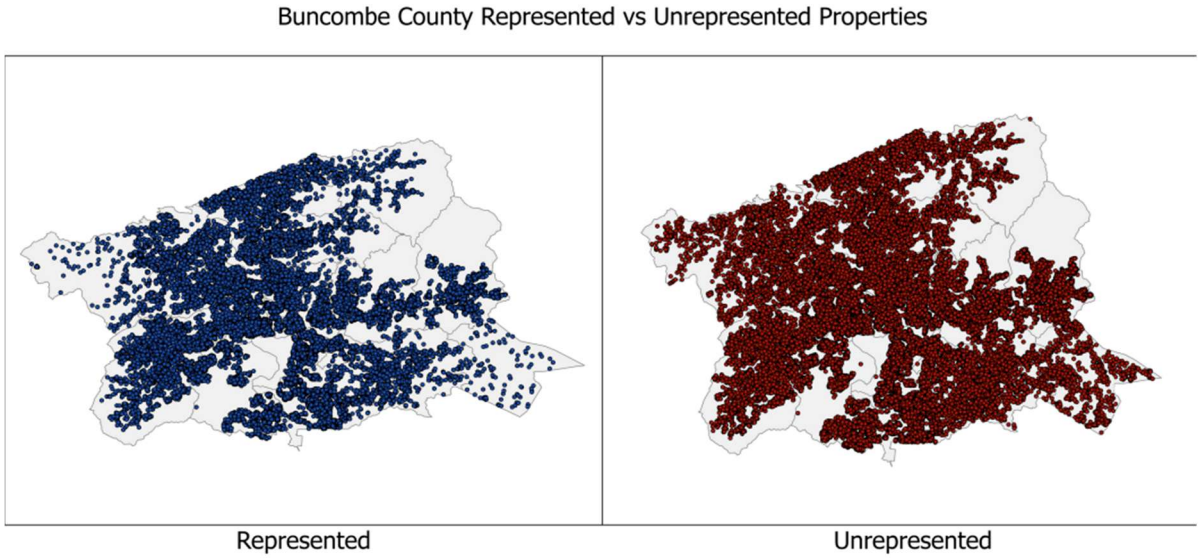
Group 20042SC53N0 – a group of 28 large two-story residences of average quality, built between 1965 and 1985 and in average condition – appear to be well represented by eight sales. The range in both market value ($102,000 to $423,100) and market value per square foot ($60.98 to $252.45) appear wide, suggesting 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 versus normal condition is reflected in the higher values in 21021RaC22G0 versus 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.

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

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. Any address can be linked to its Group ID and the summary for that group. Other closely related groups can also 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. Appraisers can use Group Summaries to review projected values to determine if they are reasonable and in balance with values for similar groups.

Every property that is not represented by at least one sale can be identified. 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.



Map 14.2 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

			Represented2		
			No	Yes	Total
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%
	SWANNANOA	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 14.2.2 Representation by Community

Figure 14.2.2 shows both the number of represented and unrepresented properties in each 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.

		Represented2 No	Represented2 Yes	Total
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 14.2.3 Representation by Race and Income

Figure 14.2.3 This table shows that almost 90% of the properties in mostly non-white middle income neighborhoods are not represented by sales. It would be risky to draw conclusions or make policy decisions about this population from ratio studies. Unfortunately, representation is rarely considered by assessment analysts.

ValueClass * Represented2 Crosstabulation

			Represented2 No	Represented2 Yes	Total
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 14.2.4 Representation by Value Class

Figure 14.2.4 shows that the lowest rates of representation are in the lowest and highest Price Classes. This is largely due to the non-homogenous inventory in those price ranges.

Condition * Represented2 Crosstabulation

		Represented2 No	Represented2 Yes	Total
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 14.2.5 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	Represented2 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 14.2.6

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

14.3 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 in order 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 submarkets 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.