

STATEMENT REGARDING PROPERTY TAX REVALUATION
SCARSDALE BOARD OF TRUSTEES MEETING
MAY 27, 2014

This statement addresses the preliminary assessment values, as released at the end of March. I will amend this statement, or develop an additional statement, once the tentative assessment roll is released. This statement is limited to analysis of single family residences (“SFRs”), which are the predominant class of property in Scarsdale.

Much of this analysis is based on information that I obtained through New York Freedom of Information Law (“FOIL”) requests.¹

I am not an employee of Scarsdale, or of Tyler. I am not in the real estate business, and I am not in the business of assisting taxpayers in contesting tax valuations. I have interests in two properties in Scarsdale.

You will see that I have many criticisms regarding the lack of transparency in this process, and fewer but still very significant criticisms regarding the actual substance and logic of the methods used.

Background and Goals. When I commenced this analysis of the revaluation, my primary focus was on the fairness and consistency of the results. Stated generally, I regard a situation as unfair and inconsistent if

- (1) The preliminary assessment value for one property is lower than the preliminary assessment value another property, but
- (2) The lower valued property has better attributes than the higher valued property.

The term “attributes” refers to the key property characteristics, such as (but not limited to) lot area (acreage), living area (square footage) and overall condition of the property.

Not only are these situations unfair and inconsistent, but they could well violate the New York law on real property taxation, which requires, generally, that the properties in a town be assessed at a “uniform percentage of value”.

Thus, for example, I identified situations in which a lower valued property has greater land value, more living area, better overall condition, better bath quality, more bedrooms and more baths than a higher valued property. I realize that there are additional factors that can affect value and that there might be errors in the data that I used. I also realize that I am not a real estate expert. So, I am not asserting unequivocally that any particular identified situation is unfair. But I am saying that there are too many to be ignored and that they all warrant review.

¹ I appreciate the efforts of Glenn Schnabel and John Goodwin in responding to those requests.

My analysis of inconsistencies led me to review the overall Tyler process in order to identify factors that might have caused these inconsistencies. Although I feel that I now understand the process, this effort was more difficult than it should have been because there is a real lack of transparency in terms of explanation and documentation.

While my own path through these issues started with the fairness issues, I think it best for purposes of this statement to now discuss the process issues. I will then return to the fairness issues, and conclude with some questions for Tyler and village management, and some recommendations.

Overall Process. I see Tyler’s process for the development of assessed values for single family residences as involving the following steps or phases.

- **Land Values.** Land values are developed, primarily as a function of neighborhood and lot area.
- **Model Estimates.** “Model estimates” are developed, primarily based on land values, living area, construction grade and overall condition. Finished basements, finished rec rooms and pools also add to the model estimate.
- **Identification of Comparables.** For each property (referred to in this context as a “subject” property), Tyler identifies a set of recently sold properties (“comparables” or “comps”). There are usually five comps, but sometimes only three or four. Comps are selected based on their similarity to the subject property.
- **Weighted Average.** The sales prices of the comps are adjusted based on the model estimates for the subject and the comps. The assessed value is calculated as a weighted average of the resulting adjusted sales prices.

This statement of the process is vague and general, but I will make it clearer below. Not all properties follow this process, or all steps of this process, but most do. I have found that properties that fit within normal parameters, in terms of lot area, living area, grade, condition, etc., follow this process.

Even though I feel I now understand all of these phases, I have concerns about the transparency. In retrospect, Tyler and/or village management could have very easily explained what it has taken me weeks to figure out. Furthermore – and really more important – I have concerns about the substantive logic of the approach and the impact on fairness.

Land Valuation. The most surprising aspect is the increase in land value as a proportion of total value. In the 2013 final roll, land value for SFRs was 29.9% of total value. In the 2014 preliminary roll, land value for SFRs was 59.6% of total value. Based on several conversations, I understand that this is the result of the “teardown” approach.² For example, if a property in a

² Internet research in the area of real estate economics indicates that the teardown approach is not the only accepted approach, and has been subject to some criticism, but discussion of this sort beyond the scope of this document.

particular neighborhood was sold for \$1.3 million, and then immediately demolished for new construction, the implied value of the vacant land was \$1.3 million plus the cost of the demolition.

The dramatic relative increase in land values is confusing, however, because of the effect it has on what I call the “implied structure value” – the excess of the assessed total value over the assessed land value. It is not hard to find situations such as the following: One property has an implied structure value of \$171,000, another has \$557,000. But the property with the lower implied structure value has over 5,000 square feet, “good” overall condition and bath quality, four bedrooms and 5.5 baths, while the other has 3,300 square feet, “normal” overall condition and bath quality, three bedrooms and 4.5 baths.

Here is how I now understand this situation: Under the “teardown” land value theory, the implied structure value should not be viewed as a construction value or replacement value. It should be viewed only as the incremental market value that the structure adds to the property, above the value of the land itself.

Another important aspect of the new land valuation is that it creates much more dispersion in values among neighborhoods. *E.g.* the basic value of 0.40 acres is \$822,000 in Fox Meadow 03 or Quaker Ridge 03, but it is \$1,318,000 in Greenacres 01.³ Although variance has been reduced within neighborhoods, it is increased for the town as a whole.⁴

My main complaint with respect to land values is the lack of transparency. Scarsdale taxpayers could and should have been informed in advance that the teardown approach would be used, resulting in substantially higher land values. Scarsdale taxpayers could and should have been informed in advance of the planned differentiation by neighborhood. It would not have been hard to publish this information back in March, with the release of the preliminary results.

Model Estimates. This is an area where I have been troubled by *both* the lack of transparency, and by the substantive formula even upon learning and understanding it.

It makes sense to me that real estate professionals can develop models, *i.e.*, formulas that calculate values based on sets of factors applied to attributes. It makes sense that value can be estimated as \$X per acre of lot area, plus \$Y per square foot of living area, plus other factors for other attributes. I can understand that these formulas can be sophisticated enough to contain factors that differentiate the value based on construction grade, overall condition of the property, bathroom quality, garage capacity, finished basement space, and so forth.

The New York Tax and Finance Department website explains how its software enables the development of model estimates, and the materials provided by Tyler in the informal meetings show model estimates. So, obviously, the Scarsdale revaluation involved the calculation of model estimates based on formulas.

³ Values in all neighborhoods are reduced for such factors as proximity to busy streets.

⁴ This observation is also supported by use of formal statistics.

However, neither Tyler nor village management ever published the formula for the model estimates. When I asked about this at the informal meeting, the response was basically, “this is something the computer does.” Reports in the local press have made it clear that the public is interested in knowing this formula. Finally, in response to a FOIL Request, village management provided me with a document that enabled me to understand the formula. I have presented it in Attachment A, along with a calculation that reproduces the published value for my own house

This formula is problematic with respect to both transparency and substance.

With respect to transparency, I have already mentioned the obvious point that it should not have required a FOIL request to understand this formula. Is there any good reason why Tyler and/or village management could not have released this at the end of March?

Even putting aside the details of the formula, I did not see anything that explained to the public the basic fact that construction grade and grade adjustment percentage are very important contributors to the formula, and thus to the ultimate assessed value. A person performing a property inquiry on the public website will not see construction grade and grade adjustment percentage. They will see such attributes as number of bedrooms, number of bathrooms, bathroom quality and central air conditioning. They see things that do not enter the formula, and they do not see things that are very important in the model estimate formula.

Thus, taxpayers who sought in good faith to use the informal process to convince Tyler to reduce the valuation were never informed in advance as to what facts really mattered.

With respect to substance, this formula raises multiple concerns.

- The interplay of the construction grade and grade adjustment percentage factors produces anomalous results. For example, a Grade B property with a 110% adjustment can have a significantly higher model value than if it were a Grade A property with a 90% adjustment. This is especially the case at lower square footages. This seem to conflict with the official manual, and it certainly conflicts with common sense.
- Another example of the surprising sensitivity of the grade adjustment percentage is a certain Huntington Ave house at Grade B with a 110% adjustment and a model estimate of \$1,173,900. Simply reducing the grade adjustment to 90% reduces the model estimate to \$933,000, which is \$240,000 less (or more than 20% less). Is Tyler seriously saying that a real estate purchaser who is willing to pay \$933,000 for a “90%” house will really pay \$240,000 more for an otherwise identical “110%” house?
- [Warning – math.] The use of the square root of the square footage for the grade adjustment component raises and distorts the relative value of properties with low square footages. A 2,000 foot property is 50% of a 4,000 foot property. But the square root of 2,000 is 44.72, while the square root of 4,000 is 63.25. Since 44.72 is 71% of 63.25, the calculation of values based on square roots implies that a 2,000 foot property is worth 71% of a 4,000 foot property.

- There is an addition for a pool, but many seemingly important attributes are not here. Most houses have central air, but some do not, and the model does nothing to subtract for the absence of central air. Similarly, there is no subtraction for the absence of a garage. There is nothing that explicitly differentiates value based on the bath quality or the number of bathrooms. I think this would surprise most people who are involved in real estate.
- This looks like a formula that was conjured up out of a multiple regression exercise based on very limited input. It excludes relevant variables and thus biases other variables. We could understand this better if we saw the exact math that was used to generate this formula.
- This formula produces results as the net of adding some very large numbers and then subtracting some numbers that are large, but not quite as large. This creates much more volatility in the net results than if the formula were composed only of additive elements.

Whatever formula emerges, Scarsdale will be living with it for the indefinite future. This was the opportunity to develop a consensus formula that could be supported by real estate professionals and understood by common sense regular taxpayers. Instead, the formula as released last week is overwrought, and inadequate, and basically, “too clever by half”.

Selection of Comparables. Tyler produced a document entitled, *Village of Scarsdale 2014 Revaluation Residential Model Development Guidelines* (the “guidelines”), and this was published to the village website on May 14, 2014. This document explains the comp selection process as one in which recent sales are selected based on their “distance” from the subject. Distance is measured based on “points” associated with attributes. For example, each square foot difference in living area counts as 10 points. For another example, a recent sale in the same neighborhood adds zero points, while a recent sale in a different neighborhood adds 2500 points.

The basic goal of the selection process is to find the five (or sometimes four or three) recent sales that are the fewest points away from the subject

Aside from the fact that this could have been published and explained earlier, my main complaint in terms of transparency has been the failure to consistently publish the points results on the comparable sale reports (“CSRs”), that were created for each property and that were shown to taxpayers during the informal meetings. The guidelines state that, “The calculation is expressed as ‘POINTS’ on each comparable sales report for each comparable sale chosen.” Despite this assurance, the points calculation was not generally included in the CSRs. This makes it more difficult to understand and audit the selection process.⁵

The most significant substantive criticism is that the selection does not take into account the grade adjustment percentage, even though that percentage plays a large role in the model estimate itself, as discussed above.

⁵ It also makes it nearly impossible to understand and audit the averaging process, as discussed below. I have a pending FOIL request for the point scores for all combinations of subjects and comps.

Otherwise, in terms of the other factors and assuming the process was implemented as explained, I am not in a position to criticize it on the merits. I cannot say it is the “wrong” way to find the closest comps, but I imagine that people with more extensive professional knowledge of real estate might find reasons to dispute it.

My real criticism of the comps process is the failure to recognize that the use of only five comps is a statistically inadequate basis on which to adjust prices, as discussed next.

Weighted Averaging of Adjusted Sales Prices. The Tyler guidelines explain that “adjusted sales prices” are calculated for each comp, and then the assessed value is calculated as a weighted average of the resulting adjusted sales prices. “The adjusted sale price for each comparable, when compared to the subject, is calculated as follows:

(Model Estimate of Subject - Model Estimate of Comparable Sale) + Sale Price of Comparable Sale).”

I will use restate this using mathematical abbreviation:

$$AS_C = S_C + (M_S - M_C),$$

where

AS_C = Adjusted Sale Price of Comp,

S_C = Sale Price of Comp,

M_S = Model Value for Subject, and

M_C = Model Value for Comp.

Since the necessary values are normally provided on a CSR, it is not hard to audit these calculations.

For purposes of explaining what is really going on, I find it helpful to rearrange the formula:

$$AS_C = M_S + (S_C - M_C).$$

With the formula rearranged in this way, one can see that the adjusted sale price as the sum of (1) Tyler’s model, M_S , plus (2) the “error” in their model, expressed as the difference between the sales price and model price, $(S_C - M_C)$.⁶ Furthermore, because M_S is a value of the subject, and does not vary by comp, one can implement the averaging simply by adding M_S to the average of the $(S_C - M_C)$ error terms.

⁶ I want to be clear that the term, “error” is my term. Tyler does not present or discuss this as an error.

I have already explained why I think the model estimate, M_S , is flawed. Now I will explain why the averaging of the $(S_C - M_C)$ error amount over five or fewer comps is just as flawed or probably even more flawed.

As an abstract theoretical matter, I can see that it make could sense to add $(S_C - M_C)$ as an error adjustment in an environment where the error is consistent. For example, if Tyler is reassessing a town and finds that sales prices on comps are consistently about \$50,000 above the model estimates for those comps, the error term become a simple, consistent correction to the model.

However, analysis of the actual comps used for the Scarsdale revaluation demonstrates huge deviations in the $(S_C - M_C)$ error. For a small (admittedly nonrandom) sample of 86 properties used as comps,⁷ it averages -\$17,191 and ranges widely as shown here:

$(S_C - M_C)$ Range	Count
< -\$250,000	9
-\$250,000 to -\$150,001	10
-\$150,000 to -\$50,001	24
-\$50,000 to \$50,000	15
\$50,001 to \$150,000	11
\$150,001 to \$250,000	7
> \$250,000	10

This wide dispersion in $(S_C - M_C)$ values shows that the model does not do a good job of predicting or explaining sales prices. Furthermore, with patterns such as these, it is largely a matter of random chance whether a property gets 5 comps that average to a large number (increasing assigned value), or 5 that average to a large *negative* number (decreasing assigned value), or anywhere in between.

It is not hard to find situations such as the following: Two basically similar properties start with model estimates that are only \$50,800 apart. But the 5 comps for one property have a large average $(S_C - M_C)$ value, increasing the property value by \$113,500, while the 5 comps for the other property have large negative average $(S_C - M_C)$ value, decreasing the property value by \$127,000. So, an initial difference of \$51,000 becomes $\$50,800 + \$113,500 + \$126,700 = \$291,000$.

I intend to pursue a more rigorous statistical analysis, but even with the limited data, I am quite certain that differences in the average $(S_C - M_C)$ error factors are substantially a reflection of arbitrary happenstance and not some fundamental or scientifically valid difference in the comps used for different properties.

Bottom line, the comps process has some theoretical appeal, and may have merit in some circumstances, but that it is has counterintuitive, distortive effects in too many actual cases in this actual Scarsdale revaluation. These effects result directly in actual cases of unfairness.

⁷ This is about 23% of all the properties used as comps.

Fairness. I have developed mechanisms to test for fairness/consistency by comparing every pair of properties (every combination of two distinct properties), and identifying situations where the property that has the lower assigned value also has the superior attributes. By “value”, I mean the 2014 preliminary total value from Tyler, unless otherwise specified. What I have been using as comparative attributes, to this point, are the following, which are readily available on the village website:

- 2014 preliminary land value.
- Living area (square feet).
- Overall condition. Scale from 1 (poor) to 5 (excellent).
- Bath quality. Scale from 1 (poor) to 5 (excellent).
- Number of bedrooms.
- Number of baths, counting a half bath as 50% of a bath.
- Presence or absence of central air.
- Presence or absence of inground pool.

Some may dispute this list, and based on what I have recently about the formula for the model estimates, I will add grade and grade adjustment percentage. I can add the age of the property, and I can add other factors upon suggestion. However, this will not require a change to the mechanics of the process.

Once I understood that theory of the land value, I felt that it was a good comparative measure that incorporates lot area and neighborhood. While I might dispute the absolute level of land values, I can still accept it as a relative measure.

Here is an example of a consistency test: Find all situations in which the lower valued property

- Is greater or equal to the other property on bedrooms, baths, central air and pools, and
- Is greater than the other property on the other compared attributes. (So, more land value, more living area, better overall condition and better bath quality.)

I am not a real estate professional, but I think most people would agree that the resulting inconsistencies (or “mismatches”) are problematic in the sense that the properties have not been valued at a uniform percentage of actual market value. I think most people would agree that these should at least be examined, and that it would be reasonable to expect Tyler to have facts/documentation that justifies the relative values.⁸

⁸ The main circumstance that can invalidate one of these observations is an actual error in the underlying data. The most common such errors involve properties that were recently renovated – a new C of O in 2013 – with updated total values, but still with the pre-renovation living area, overall condition and other attributes. I remove these from the analysis universe when I discover them. I also recognize that very new houses can have higher values, analogous to a “new car” effect, and that very expensive houses can have additional differentiating factors, such as landscaping, tennis courts, elevators, extensive electronics, etc. But these additional considerations will not impact most analyses in Scarsdale.

The results of this particular test are shown here.

Category	Mismatch Count	Distinct HV SFRs	Distinct LV SFRs	Avg Value Difference	Max Value Difference
All Mismatches	14,542	1,927	1,624	99,655	1,803,000
A Distinct SFR is on the HV Side of 5 or More Mismatches	12,182	719	1,582	104,228	1,505,000
A Distinct SFR is on the LV Side of 5 or More Mismatches	12,649	1,890	535	101,025	1,164,000

The first line shows that this test identified 14,542 mismatches. There were 1,927 distinct Scarsdale SFRs involved in these on the higher value (“HV”) side, and 1,624 distinct Scarsdale SFRs involved on the lower value (“LV”) side. (Remember, if your property is on the HV side it means your Tyler preliminary assessment is higher than that of others, even though they have better attributes.) The average difference in value was \$99,655, and the greatest difference was \$1,803,000.

The next line is restricted to cases where the same SFR is in the HV side of five or more mismatches, and the third line is restricted to cases where the same SFR is in the LV side of five or more mismatches. The point here is to focus on properties that are more frequently involved in mismatches.

In one case – and it is not the worst case – a Brewster Road property in Greenacres was valued at about \$1,200,000, with 46 other properties at lower values, despite having more land value, more living area, better overall condition, and better bath quality. Also, 23 of the 46 had more bedrooms and more baths. This house was built in 1926. I drove by it, and it did not appear to be gold plated. The minimum of the 46 was at \$807,000, and the average was \$1,134,000

Even more mismatches are observed if the test is modified in various reasonable ways, such as accepting equal overall condition and bath quality but finding cases where the lower valued house has at least 50% more living area.

Furthermore, my analysis indicates that these types of mismatches can be traced back to the process flaws described above.

Questions for Tyler and Village Management. Attachment B contains a list of questions, primarily directed at Tyler, but in some cases village management. I submit these in advance, in the hope that Tyler can be prepared to answer them at the May 29 meeting.

Recommendations. I note first that the Tentative Roll could well address the problems I have identified. We may find that Tyler has revised its model, and its comps, and has eliminated all reasonable fairness issues. If this is the case, I will be the first to acknowledge it. However, I am afraid that this will not be the case.

When taxpayers argue that the revaluation has flaws, a common response from supporters is that the grievance process affords an adequate opportunity to correct those flaws. Two things trouble me about this response.

- First, the grievance process forces taxpayers (such as the owner of the Brewster Road property described above) through the aggravation and uncertainty of obtaining an appraisal, possibly paying an attorney or other representative, and arguing the nuances of market value. This, despite the fact that ***Tyler and village management are in possession of all the facts necessary to prove that the taxpayer's assigned value is not at a uniform percentage of value as compared to other properties.***
- Second, this response implies that any valuation mistakes are property-specific irregularities. What I have learned, and have tried to explain, is that the flaws are comprehensive and systemic. The flawed model is not a one-off factual mistake; it is a broad problem. The statistically invalid use of comps, at least here in Scarsdale, affects many taxpayers, positively and negatively, in random and arbitrary ways.

I understand that the preliminary 2014 numbers, in aggregate, are probably fairer than the 2013 numbers. So, I know it is difficult to defer the implementation of the revaluation.

I recommend that if the Board of Trustees elects to approve the new revaluation, it also set up some mechanism – perhaps charge an existing committee – to review fairness in a comprehensive way, and identify and eliminate inconsistencies. The committee would also develop a truly transparent real estate model for Scarsdale that can be supported by real estate professionals and understood by common sense regular taxpayers. The committee would review the “5 comps” approach, and discard it if it agrees that the approach is not statistically valid.

Or if even this is too much, and everyone is overwhelmed by revaluation exhaustion, I ask that the Board at least declare a willingness to consider good faith, comprehensive proposals developed by Scarsdale taxpayers or groups of Scarsdale taxpayers.

I this way, we can really see a path toward solving this problem in 2015.

Thank you for your consideration,

Michael Levine
54 Walworth Ave
914-725-7716
ml@mlevine.us

ATTACHMENT A
MODEL ESTIMATE FORMULA FOR SCARSDALE REVALUATION

Model Estimate:

0.9897 * (land value).

Plus: \$138.3028 * (square feet of living area) if the property is construction grade A, or
\$56.2649 * (square feet of living area) if the property is construction grade B.

Plus: \$251.3456 * (square root of square feet of living area) * (construction grade
adjustment percentage).

Plus: \$90.1151 * (square feet of finished basement).

Plus: \$8.8048 * (square foot of finished rec room).

Plus: \$81,750.17 for an inground pool.

Minus: \$49.5873 * (square feet of living area) if the property is overall condition 5, or
\$63.8349 * (square feet of living area) if the property is overall condition 4, or
\$73.5378 * (square feet of living area) if the property is overall condition 3.

Minus: \$1.2252 * (square feet of living area) * (2013 – year of construction).

Plus/Minus: An amount that varies by neighborhood, as follows.

Edgewood 01	-207,828.50
Edgewood 02	-11,065.88
Edgewood 03	110,189.60
Fox Meadow 01	0.00
Fox Meadow 02	21,510.43
Fox Meadow 03	70,014.81
Greenacres 01	-129,859.80
Greenacres 02	0.00
Heathcote 01	-160,862.80
Heathcote 02	-132,486.90
Heathcote 03	15,849.13
Quaker Ridge 01	-323,971.90
Quaker Ridge 02	-45,698.38
Quaker Ridge 03	-2,772.45

Minus: \$681,755.00

Example (54 Walworth Ave):

Land value: \$898,000.
Neighborhood: Greenacres 02.
Square feet of living area: 3,925.
Square feet of finished basement: 0.
Square feet of rec room: 1,142.
Grade: A.
Grade adjustment pct: 90.
Overall condition: 3.
No pool.

Model Estimate for Example:

$$\begin{aligned} & 0.9897 * (\$898,000) \\ + & \$138.3028 * (3,925). \\ + & \$251.3456 * (3,925 ^ 0.5) * (90). \\ + & \$90.1151 * (0). \\ + & \$8.8048 * (1,142). \\ + & \$0.00 \text{ for no pool.} \\ - & \$73.5378 * (3,925). \\ - & \$1.2252 * (3,925) * (2013 - 1917). \\ + & \$0.00 \text{ factor for Greenacres 02.} \\ - & \$681,755.00 \\ = & \$1,426,806.05 \end{aligned}$$

Actual published Model Estimate = \$1,426,500.

ATTACHMENT B
QUESTIONS FOR TYLER AND/OR VILLAGE MANAGEMENT

All questions refer only to single family residences.

- (1) Can you provide the exact math (*i.e.*, data and methods) used to produce the formula for the model estimates?
- (2) The model estimates for some properties, especially those used as comps, seem to have changed over time. I say this because different FOIL requests resulted in different model estimates. Why was this done?
- (3) If the model estimate for a property used as a comp was changed between the time it was used as a comp and the time it was the subject of its own valuation, did you recalculate values for the properties for which it was used as a comp? If not, why not?
- (4) Why does the formula for the model estimate **not** include bath quality, or the number of bathrooms, or the existence of central air, or the existence of a garage? Is it your belief that these attributes do not affect market value?
- (5) According to the New York Assessor's Manual, field assessors are instructed to "consult your supervisor" before applying a construction grade adjustment. This suggests that these adjustments are unusual. Yet, a sample [admittedly nonrandom] shows that more than 50% of the properties have grade adjustments other than 100%. Can you explain the reasoning and process behind this?
- (6) How many assessments were changed between the preliminary and the tentative? How many went up? How many went down?
- (7) Can you show us studies from other projects that show patterns, count, averages, standard deviations/variances and ranges of ($S_C - M_C$) values?
- (8) How often, as a percentage, is the 2014 preliminary total value something other than the weighted average of the adjusted sales prices of the comps? When this happens, do you produce documentation that covers the decision and the calculation?
- (9) Is there any indicator in the data that identifies houses that were not physically inspected, and for which some of the attributes (such as overall condition) are guesses/defaults?
- (10) [For village management]. Can you please post on the village website the contract between Tyler and the village, any contract amendments or modifications, and all invoices submitted by Tyler indicating the nature of services provided?