

## Valuation Impacts of Land and Land Related Attributes

Back in 2014, one of the more surprising aspects of the Tyler reval was the fact that the land value became a much more important element in the determination of the total value of single family residences than it had been previously. The importance of the land value was even further extended in the Ryan reval.

The main purpose of this memo is to examine and illustrate this situation. The memo will also show that many of the differences between the Tyler and Ryan values can be attributed to differences in their handling of land related elements.

**Background.** Before getting into numbers, here are two key observations.

First, at a basic level, we can observe what I will call the “official land value.” New York requires that the Tentative and Final Rolls show a land value in addition to the total assessed value, even though it is only the total value that can be grieved and that otherwise matters for assessment and taxation purposes.<sup>1</sup>

Additionally, at a deeper, more analytical level, we can view the underlying elements that are used in determining the official land value. These include (i) the acreage, (ii) the location (in the sense of the neighborhood), (iii) the amount of traffic on the street, and (iv) possible other property-specific factors, generally referred to as “influences”. Examples of influences would be a steep slope, wetness or (on the positive side) a nice view. I will refer to all of these elements as “land related attributes.”

The land related attributes are not only used to determine the official land value. Under the Tyler and Ryan methodologies, they also impact the total assessed value beyond their impact on the official land value. This will be explained further, below.

The next section examines the relationship between the official land value and the total assessed value. The section after that examines in more detail the full impact of the land related attributes.

**Impact – Official Land Value.** Although it is not necessarily the case that a mass appraisal includes 100% of the official land value in the total assessed value, I would say that this is “approximately” how Tyler approached the process, and exactly how Ryan approached the process. To be more specific, with respect to Tyler,

- Land values were derived based on neighborhood, acreage, traffic and influences.
- The derived land values were used as the official land values in the roll, subject only to rounding.
- The derived land values were also used in the multiple regression that determined “model estimates” for properties with residences, with the result that 98.97% of the derived land value went into the model estimate. The model estimate was then used with “comparable sales” to determine a final value.<sup>2</sup>

---

<sup>1</sup> There may be situations where the official land value has standalone relevance, but these do not apply to Scarsdale.

<sup>2</sup> Discussion of the comparable sales approach is outside the scope of this memo, but I have addressed it elsewhere.

- So, technically, Tyler did not use 100% of the derived land value – it used 98.97%, subject to the further impacts of the comparable sales process.

Ryan’s process was simpler.

- Land values were derived based on neighborhood, acreage, traffic and influences.
- The derived land values were used as the official land values in the roll, subject only to rounding.
- The land values as used in the roll were added to separately-calculated “building” values to get the total values for the roll.

It should be noted that the official land value is always equal to the total assessed value where a property consists of vacant residential land.

Analysis of the recent rolls shows that the official land value is the predominant component of total assessed value. Table 1 shows the history, starting with the 2013 Final Roll for all of Scarsdale.

<b>Table 1</b>			
<b>Land and Total Values on Official Rolls</b>			
<b>Roll</b>	<b>Land Value</b>	<b>Total Value</b>	<b>Land Pct of Total</b>
2013 Final	49,055,390	154,563,530	31.74%
2014 Tentative (Tyler)	5,879,397,452	10,081,342,688	58.32%
2014 Final	5,875,893,367	10,043,758,088	58.50%
2015 Tentative	5,866,643,155	9,989,289,380	58.73%
2015 Final	5,864,226,645	9,969,719,544	58.82%
2016 Tentative (Ryan)	6,053,561,485	10,027,138,671	60.37%
2016 Final	6,011,228,834	9,956,632,220	60.37%
2017 Tentative	5,991,067,816	9,931,051,913	60.33%

The land percentage nearly doubled in the 2014 Tyler Reval and then jumped slightly further in the 2016 Ryan Reval.

Since there might be some concern that the mix of properties within the rolls might have changed over time, Table 2 is the same analysis but limited to 4,994 properties that I describe as “Stable Residences.” These are properties that appeared on all eight rolls as residences but not including properties with permitted improvements or new construction, tax exempt properties, split properties and other circumstances that could cause valuation changes to reflect anything other than revals and grievances.

Table 2			
Land and Total Values on Official Rolls -- Stable Residences			
Roll	Land Value	Total Value	Land Pct of Total
2013 Final	36,768,621	123,991,781	29.65%
2014 Tentative (Tyler)	4,821,092,400	8,037,424,300	59.98%
2014 Final	4,819,579,790	8,006,628,700	60.19%
2015 Tentative	4,812,879,570	7,900,712,400	60.92%
2015 Final	4,811,260,361	7,884,549,365	61.02%
2016 Tentative (Ryan)	5,019,750,000	7,783,875,000	64.49%
2016 Final	4,984,899,000	7,728,115,400	64.50%
2017 Tentative	4,971,225,938	7,642,670,957	65.05%

The Tyler and Ryan increases in the land valuation are even more apparent using this more refined dataset, and the land percentage is now 65%.

As an indication that appraisal professionals do not universally create these high land percentages, Table 3 shows the values for the Mamaroneck Strip as they appear on Mamaroneck assessment rolls. These properties are part of the Scarsdale School District, so I would think they are as comparable as any to Scarsdale properties.

Table 3			
Land and Total Values for Scarsdale School District on Mamaroneck Rolls			
Roll	Land Value	Total Value	Land Pct of Total
2012 Final	1,884,230	6,476,425	29.09%
2013 Final (reval)	96,733,700	348,988,253	27.72%
2014 Final	96,733,700	349,634,253	27.67%
2015 Final	96,733,700	404,516,838	23.91%
2016 Final	96,946,300	400,599,376	24.20%
2017 Tentative (reval)	133,529,300	411,547,501	32.45%

Although there was a jump in 2017, the land percentage is still just 32%.

Based on my experience with assessment professionals, I would not be surprised if any of them were to dismiss my concern about the land percentages. They tend say that a land value is only shown on the roll because New York requires it to be shown, but it is otherwise meaningless. They tend to say that it is only the total value that can be grieved and that otherwise matters, etc. My response is that, as explained above, an actual review of Tyler and Ryan shows that basically the full amount of the official land value was added mathematically in calculating the total assessed value. Thus, if we want to understand the total assessed value – as developed by these vendors -- we have to understand the official land value.

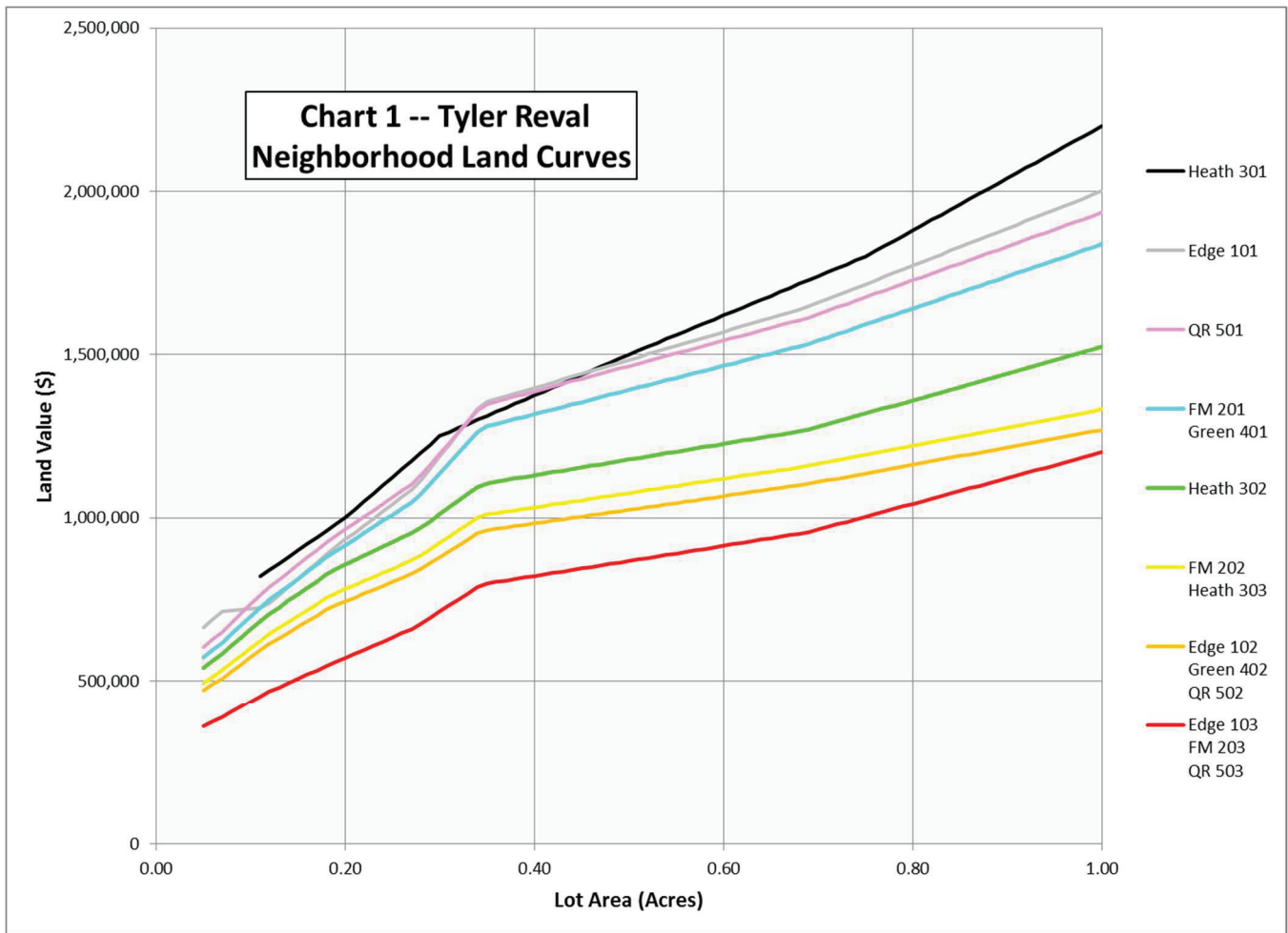
Indeed, as the largest component of the total assessed value, the land is at least as important as building related attributes such as square footage, number of baths, grade, condition, etc.

**Impact – Land Related Attributes.** I also performed a further, more intricate, analysis of the land related attributes by decomposing the Tyler and Ryan formulas. Although I am not showing the math, I went through the formulas to break the Tyler values and the Ryan values each into separate components.

Table 4 shows the results for Tyler.

<b>Table 4</b>					
<b>Breakdown of 2014 Tentative Roll (Tyler) -- Stable Residences</b>					
<b>Value Component</b>	<b>Amounts Related to Acreage and Neighborhood</b>	<b>+/- Other Amounts Related to Location</b>	<b>+/- Amounts not Related to Location</b>	<b>+/- Technical Elements</b>	<b>= 2014 Tentative Value</b>
Land	5,010,569,700	-189,321,765	0	-155,535	4,821,092,400
Building	-17,129,526	0	3,195,997,644	37,463,781	3,216,331,900
Total	4,993,440,174	-189,321,765	3,195,997,644	37,308,246	8,037,424,300

- For each column, the amount on the Land row plus the amount on the Building row equals the amount on the Total row.
- The far right column shows exactly the same 2014 Tentative Roll Land and Total values that appear on Table 2. The other columns add up to this column.
- The largest value component is the \$5.011 billion of Amounts related to Acreage and Neighborhood on the Land row. This value comes directly from the land curves that Tyler published and that I am illustrating in the following Chart 1.
- As will be discussed more extensively below, Tyler based residential land values on 14 neighborhoods, two for Greenacres and three for each of the other elementary schools. Ryan reverted to the five elementary school neighborhoods.
- There are really only eight distinct curves on Chart 1, because some neighborhoods shared curves, as shown. For clarity, I have limited this chart to one acre. The published curves go at least as high as necessary to cover the Scarsdale properties.



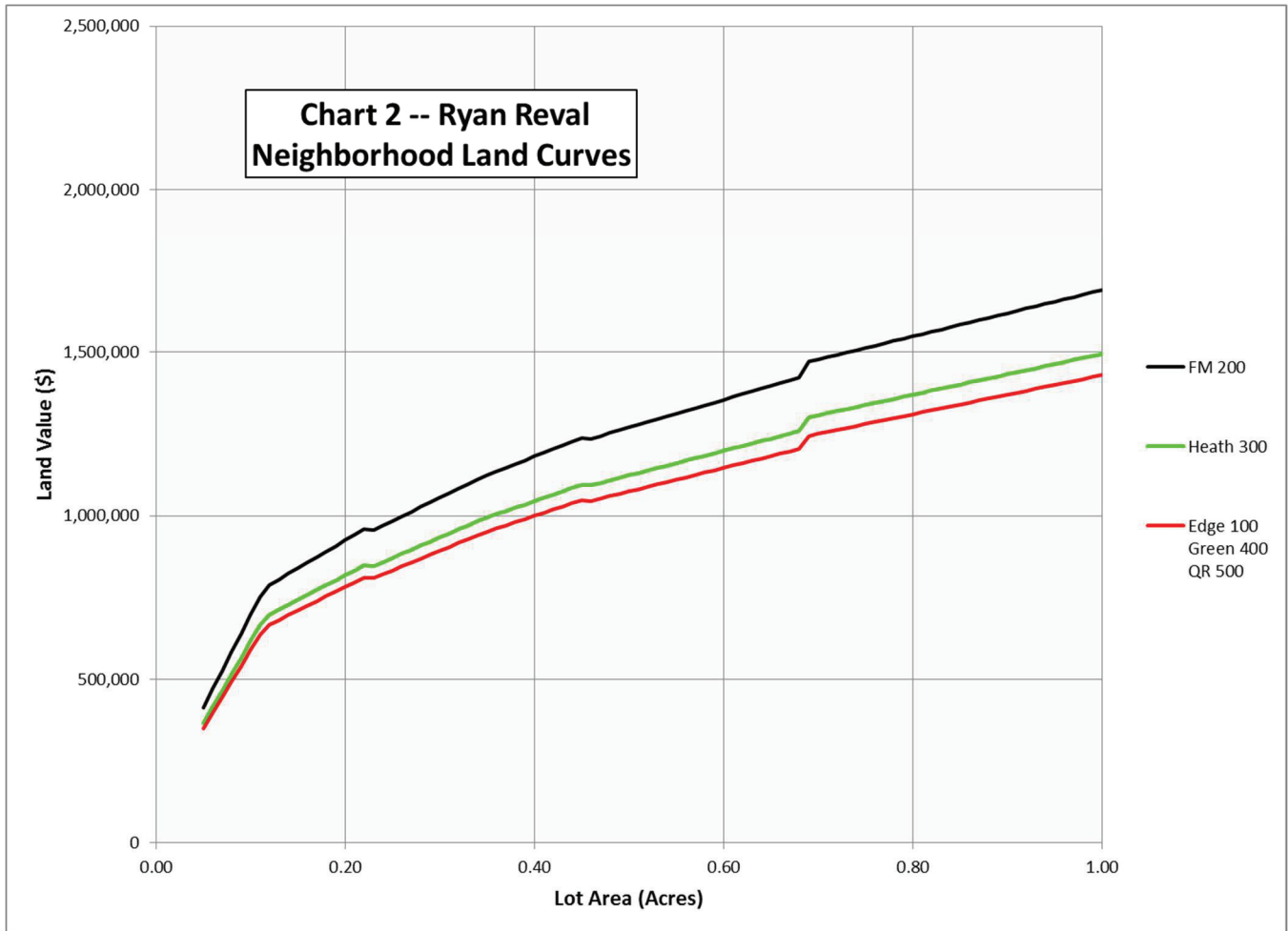
- The -\$17 million of Amounts related to Acreage and Neighborhood on the Building row exists because Tyler’s formula included a flat amount that depended only on neighborhood (e.g., \$110,189.60 for the Edgewood 103 neighborhood, -\$132,486.90 for the Heathcote 302 neighborhood). These amounts were not added or subtracted in calculating the official land value, but they were added or subtracted in calculating the model estimate, and thus in determining the total value.
- The -\$189 million Other Amounts Related to Location on the Land row are the (net) Tyler adjustments for traffic and influence.
- The \$3.196 billion Amounts not Related to Location on the Building row includes the balance of the Tyler model estimate.
- The Technical Elements on the Land row are basically rounding. On the Building row this includes the impact of the comparable sales after the model estimate.<sup>3</sup>

<sup>3</sup> Fine Print re (1 - .9897)

Table 5 shows the corresponding results for Ryan.

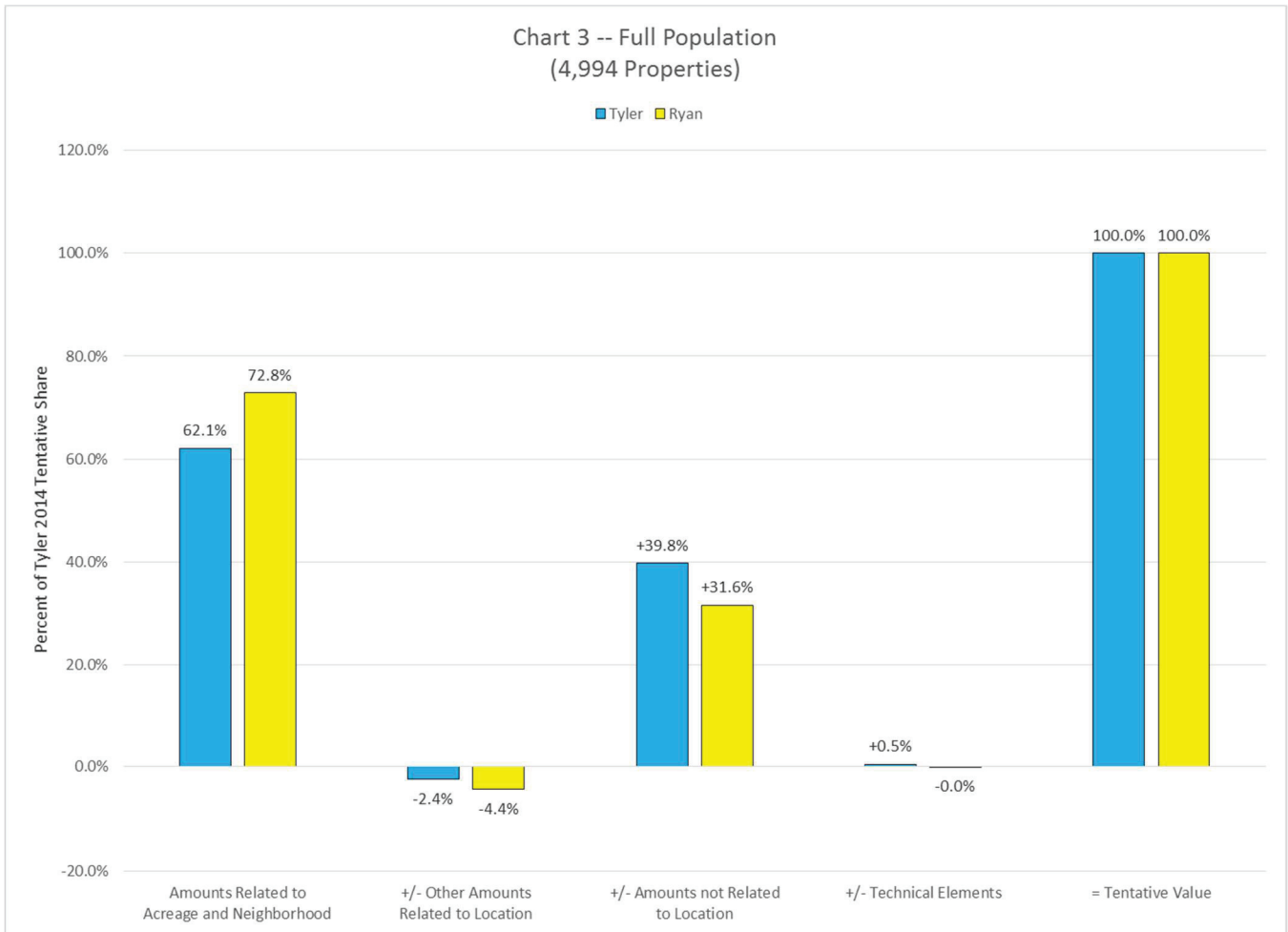
<b>Table 5</b>					
<b>Breakdown of 2016 Tentative Roll (Ryan) -- Stable Residences</b>					
<b>Value Component</b>	<b>Amounts Related to Acreage and Neighborhood</b>	<b>+/- Other Amounts Related to Location</b>	<b>+/- Amounts not Related to Location</b>	<b>+/- Technical Elements</b>	<b>= 2016 Tentative Value</b>
Land	5,286,081,567	-265,194,237	0	-1,137,330	5,019,750,000
Building	381,864,650	-74,953,873	2,457,663,010	-448,787	2,764,125,000
Total	5,667,946,217	-340,148,111	2,457,663,010	-1,586,117	7,783,875,000

- The far right column shows exactly the same 2016 Tentative Roll Land and Total values that appear on Table 2. The other columns add up to this column.
- The largest value component is the \$5.286 billion of Amounts related to Acreage and Neighborhood on the Land row. This value comes directly from the land curves that Ryan published and that I am illustrating in the following Chart 2.
- As noted above, Ryan reverted to only five neighborhoods. Each Ryan curve is based on a single “base” curve, multiplied by 1.30 for Fox Meadow, 1.15 for Heathcote and 1.10 for Edgewood, Greenacres and Quaker Ridge. There are only three distinct curves on Chart 1, because Edgewood, Greenacres and Quaker Ridge share the same curve.



- The \$382 million of Amounts related to Acreage and Neighborhood on the Building row exists because Ryan’s formula also multiplied non-land elements (*e.g.*, square root of square foot, number of baths) by the applicable neighborhood multiplier (1.30, 1.15 or 1.10).
- The -\$265 million Other Amounts Related to Location on the Land row are the (net) Ryan adjustments to Land value for traffic and influence. There is also -\$75 million on the Building row because Ryan’s formula also multiplied non-land elements by the applicable traffic multiplier (*e.g.*, 1.00 for Light traffic, 0.95 for Medium traffic),
- The \$2.458 billion Amounts not Related to Location on the Building row includes the balance of the Ryan Building component.
- The Technical Elements on the Land and Building rows are rounding.

Based on the foregoing, I developed Chart 3 as a format to compare Tyler and Ryan. Again, these are results for the 4,994 properties previously described as Stable Residences.



Basically,

- Blue represents Tyler. Yellow represents Ryan.
- The five pairs of columns correspond to the five columns in each of Tables 4 and 5. The pair of columns on the far right is the total.
- The column heights *derive* from the Total lines in Tables 4 and 5. However, instead of showing dollar amounts, the vertical axis is scaled to show values as a percentage of the Tyler 2014 Tentative Roll share for this population. (The far right column is always 100% for Tyler, and is



100% for Ryan in this chart, because the chart comprises the full population. The scaling for Ryan is explained further in the following section.)

- The first pair of columns shows that the Ryan impact of acreage and neighborhood exceeds the Tyler impact. The second pair of columns shows that Ryan had more net reductions for traffic and influences, but not enough to offset the greater Ryan impact in the first pair.
- The third pair of columns shows that, as a result, the Ryan share not related to location is less than the Tyler share. Even for Tyler, this share is less than 40% of the total.
- The fourth pair of columns shows relatively insignificant technical impacts.

Bottom line, consistent with the view based on the official rolls in the preceding section, land related attributes account for the majority of the total assessed value and that percentage increased in the Ryan reval. This reinforces the point that land related attributes are more important to the total assessed value than building related attributes such as square footage, number of baths, grade, condition, etc.

**Further Analysis of Fox Meadow.** I have performed analyses for a range of different sub-populations, but in the interest of brevity this memo only drills down on Fox Meadow. Fox Meadow definitely shows the impacts of the differences between Tyler and Ryan.

The Tyler Fox Meadow neighborhoods were coded as 201, 202 and 203. As shown in Chart 1 the most expensive land curve was the 201 curve (blue), next was the 202 curve (yellow), and the least expensive was the 203 curve (red).

So, when Ryan consolidated the neighborhoods, the three curves were replaced by one curve. It was not surprising that (all other things being equal), the 201 properties would generally decrease relative to the other two and the 203 properties would increase relative to the other two.

Chart 4 compares the Ryan land curve to the three Tyler land curves, illustrating also that the Ryan curve was close to the Tyler 201 curve and well above the other two.

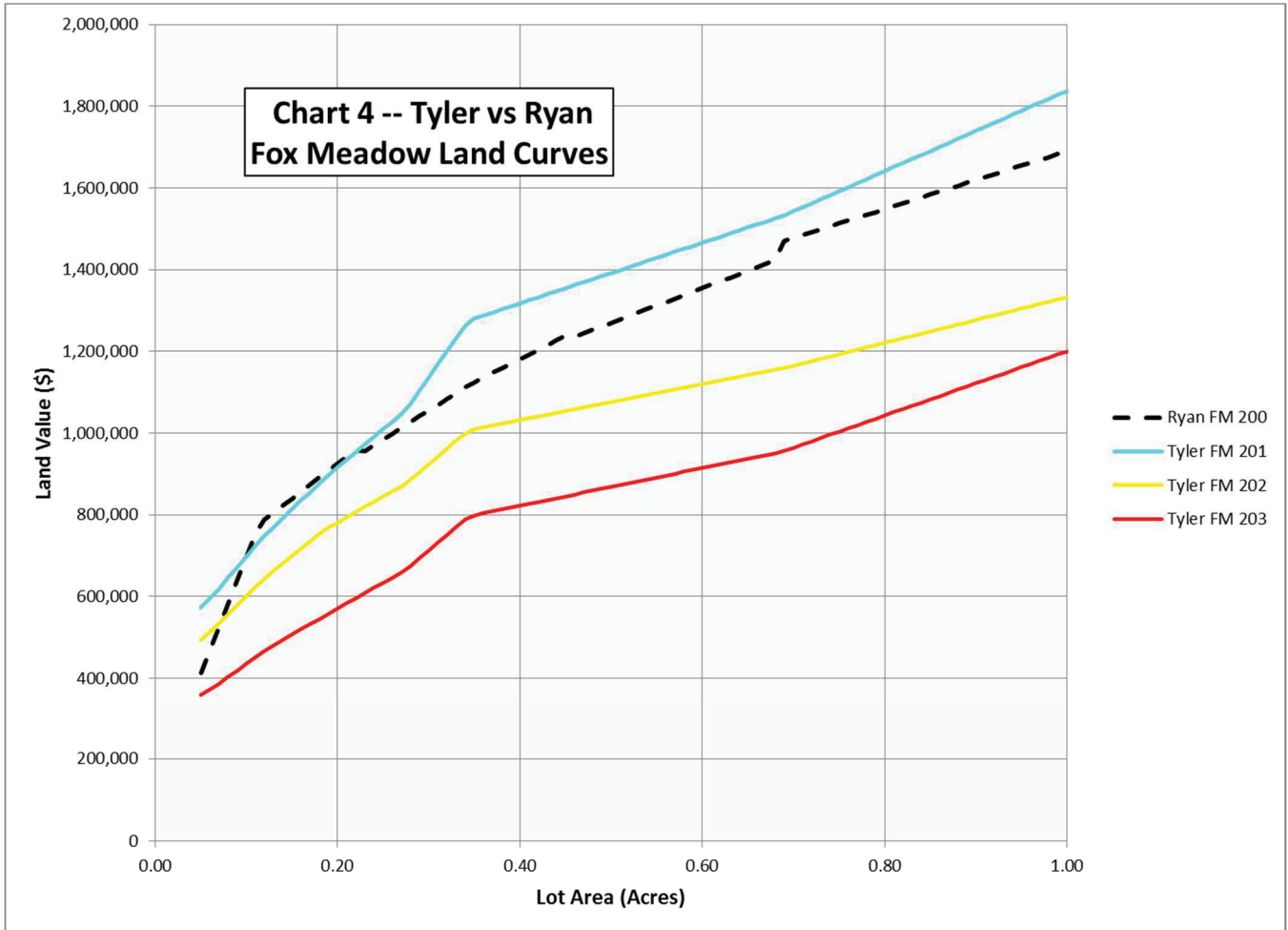
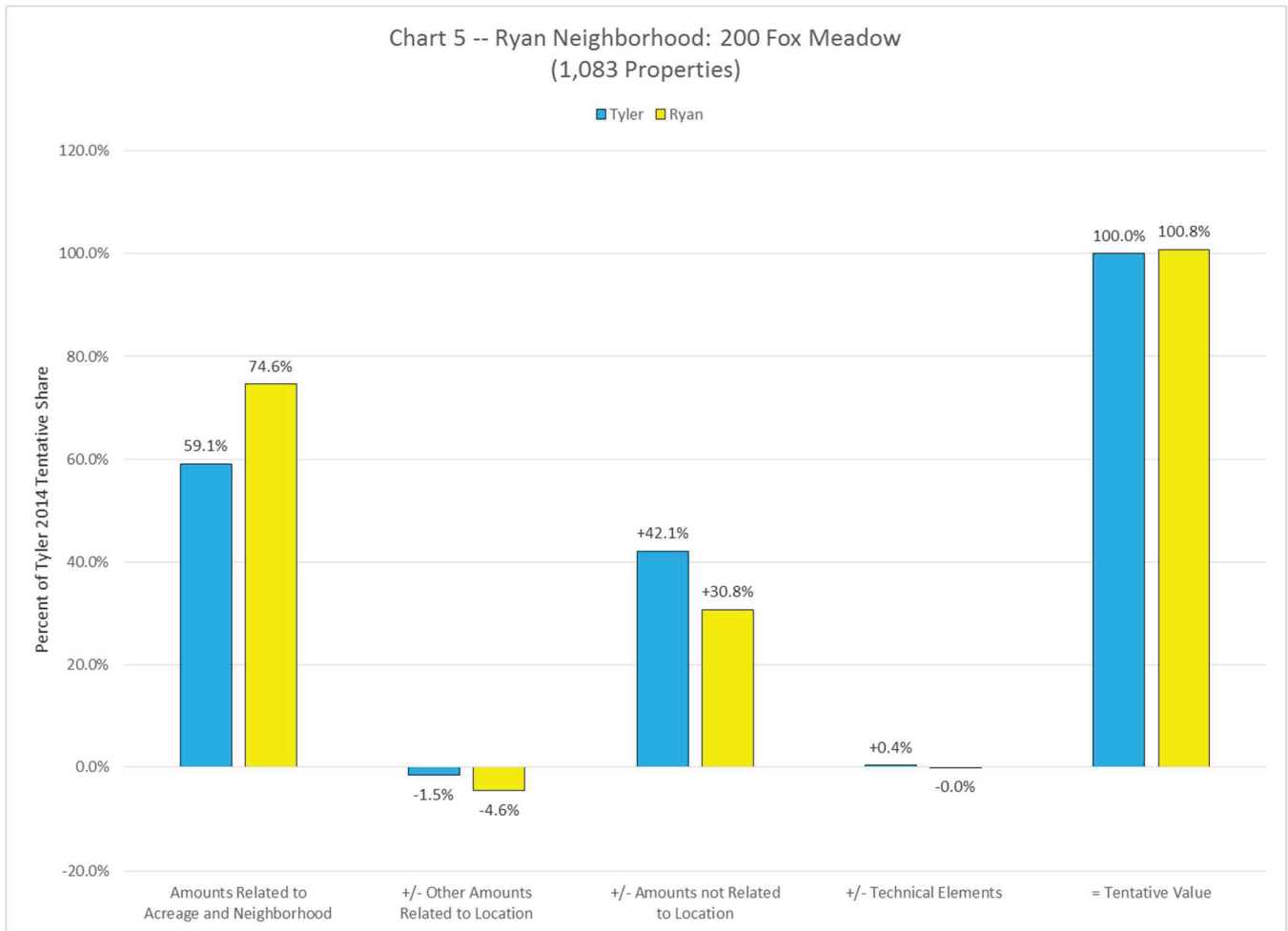


Chart 5 is the full Ryan Fox Meadow, comprising all three Tyler neighborhoods.

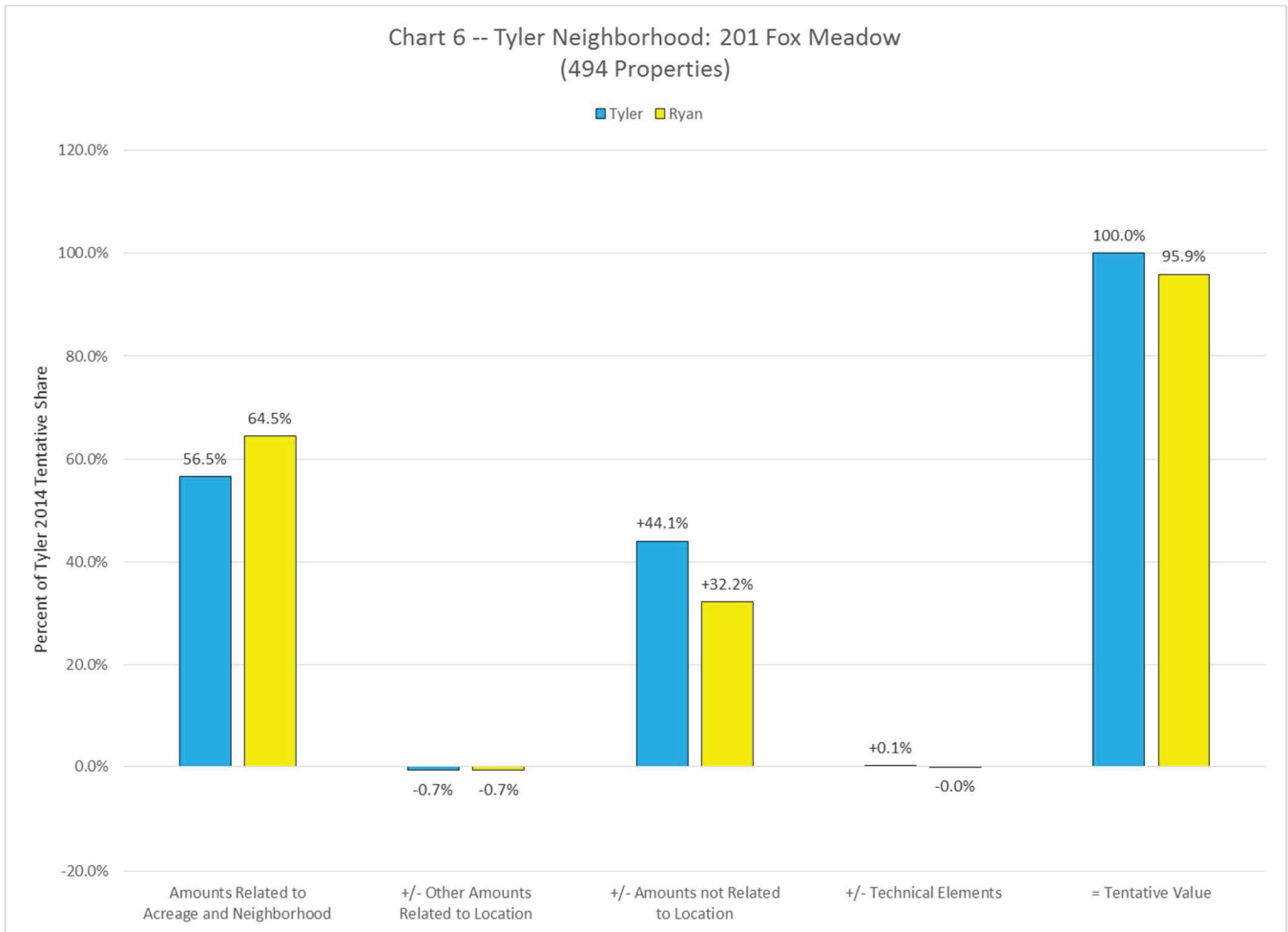


This chart looks quite similar to Chart 3. The acreage and neighborhood amounts were dominant under Tyler and became even more dominant under Ryan.

I should explain the far right column, which shows Tyler at 100%, but Ryan at 100.8%. The underlying explanation is that these 1,083 properties constituted 24.27% of the 2014 Tentative Roll values in the Stable Residences population. With the Ryan reveal, these same 1,083 properties constituted 24.46% of the 2016 Tentative Roll. Mathematically,  $24.46/24.27 = 1.0076 = 100.8\%$ . (Equivalently, this population's share went up by 0.8%.)

Indexed in this way – showing the Ryan share as a percentage of the Tyler share – the chart also shows how the changes in the components contribute to the Ryan impact.

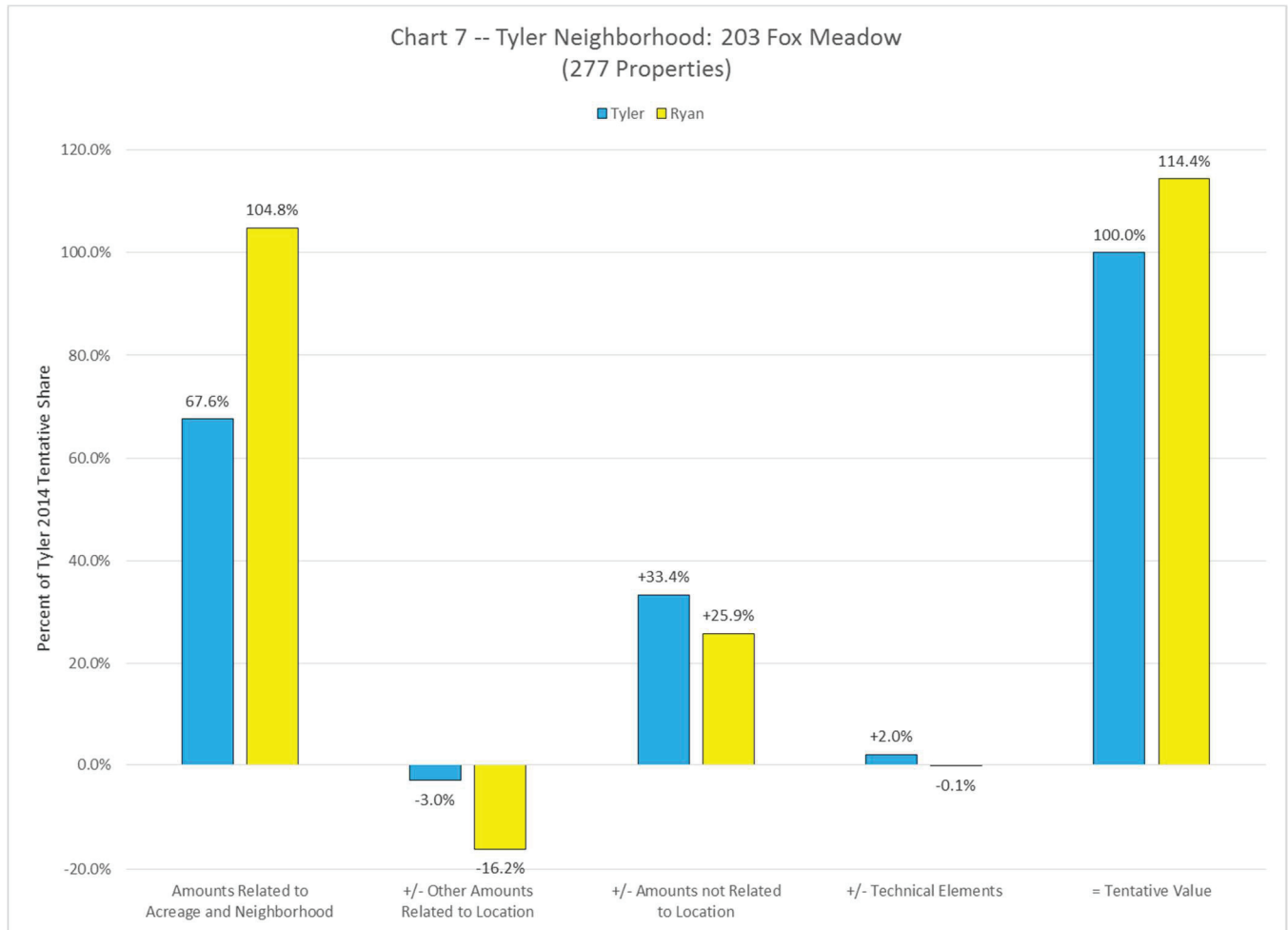
Chart 5 really masks the very different impacts among the three Tyler neighborhoods within Fox Meadow. Chart 6 shows just the Fox Meadow 201 neighborhood.



The acreage and neighborhood amounts increase from Tyler to Ryan, but this increase is moderate and is more than offset by the reduction in amounts not related to location (*i.e.*, amounts related only to the buildings and other improvements.)

Overall, the far right column shows a decrease in this population’s share of the full Stable Residences. . (The Tyler share was 13.95%, the Ryan share was 13.38%, and  $13.38/13.95 = 0.9592 = 95.9\%$ .)

The situation is very different for the Fox Meadow 203 neighborhood, as shown in Chart 7.



Here, the amounts related to acreage and neighborhood increased tremendously, entirely consistent with Ryan’s consolidation of this neighborhood with the two others that previously had higher land curves.

The second pair of columns shows that Ryan did make downward adjustments based on traffic and influences. John in fact discussed this at the August 17, 2016, meeting. He said that, even though he had “consolidated the sub-neighborhoods”, he was “able to capture some of the sub-neighborhood issue that was legitimate ... with other adjustments, *i.e.*, like traffic.” I understood this as saying that he used the traffic and influences adjustments where he thought it appropriate to retain differences among 201, 202 and 203 properties.

So, he did make downward adjustments, but obviously not enough to fully offset the underlying increases shown in the first pair of columns. Taking him at his word, he effectively concluded that the narrowing of the differences among the Fox Meadow neighborhoods was justified.

In this population, the average amounts not related to location are even lower than for the overall Stable Residences population in Chart 3.

The far right column shows Tyler at 100%, but Ryan at 114.4%. In other words, under Ryan, the 203 neighborhood experienced a 14.3% increase in its share of the assessed values. (The Tyler share was 3.67%, the Ryan share was 4.19%, and  $4.19/3.67 = 1.1435 = 114.4\%$ .) *And, to reiterate the basic point, the dominant driver in causing this result is the change in handling of land related attributes.*

**Observations Regarding Methodology.** Because of the dominant importance of land and land related attributes in the determination of total value, one would think that the vendors would provide good explanations of how they derived these values. However, Tyler’s explanations of these derivations are much weaker than Tyler’s explanations of other aspects of the reval, and Ryan provided no useful explanation.

The inadequacy of the explanations for these dominant components is particularly problematic in that the two vendors came up with significant differences that contributed to the significant differences in their total assessed value.<sup>4</sup>

With respect to Tyler,

- There was no documentation as to how neighborhoods were determined. The work was apparently done by Salim Serdah of Tyler, who provided only the following very general explanation.

Once these preliminary [school district] neighborhoods were assigned and posted, further delineation was required within each of these areas. Sub-neighborhoods were created where required, taking care to place neighborhood lines along a street or highway to avoid differing land values on adjacent parcels. The basis for these sub-neighborhoods was primarily differences in lot size (density) and housing stock. Sales were useful in identifying these areas, as well.

- The public was informed that land values within neighborhoods were based on sales of vacant land and teardowns, and a list of such sales was posted. However, there were only a limited number of these sales, and there was no documentation explaining how these were used to derive the curves shown in Chart 1. In some cases that I looked at, the teardown data was not consistent with the curves.
- Using FOILs, I eventually learned that Tyler had supplemented the vacant land/teardown approach with an analysis that they referred to as the “land residual technique.” As explained in their final report,

The land residual technique estimates the replacement cost new of the buildings as of the date of the sale, then deducts for accrued depreciation, yielding a replacement cost new less depreciation (RCNLD) for the building. The RCNLD can be deducted from the total selling price of the property to derive the portion of the selling price which can be allocated to the land.

---

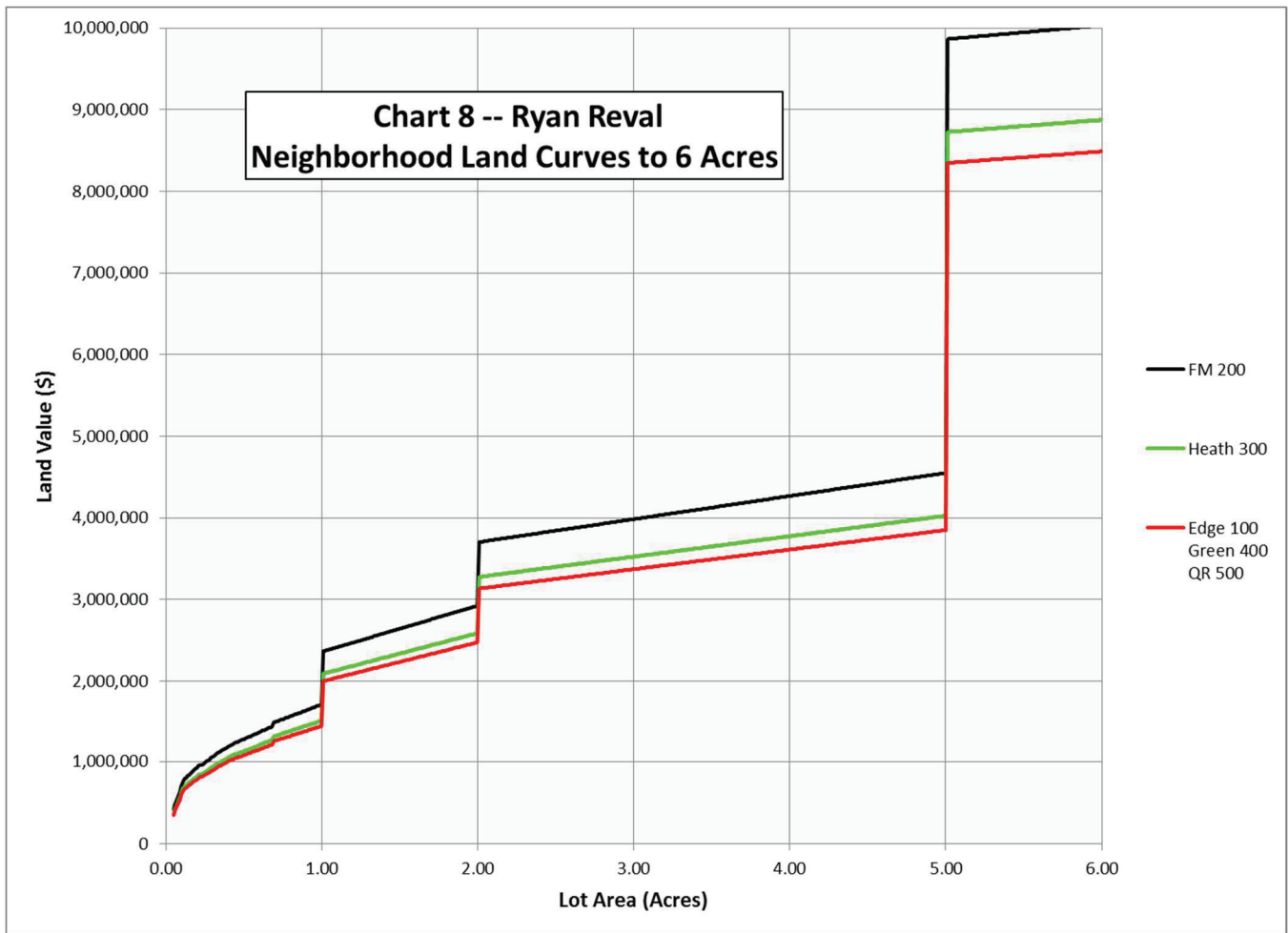
<sup>4</sup> Obviously, acreage itself is a hard number, based on surveys and other formal documents, and I am not criticizing the determination of acreage.

- This explanation – which was not provided while Tyler was on site – is still at a high level and does not explain the integration of this technique with the teardown data. It does not explain the derivation of the curves. It seems to me that the combined use of two distinct techniques could have resulted in biases if the two techniques were not combined in a uniform way for all neighborhoods.
- Tyler did not include property-specific influence and traffic attributes on the data mailers that Tyler provided to the public.

At least with Tyler, there is some indication of the techniques that may have been used. One gets the sense that they could have documented their processes and conclusions if we had been able to pursue an explanation. But overall, Tyler's documentation of these land and land related attributes was much weaker than Tyler's documentation of other aspects of the reval.

Ryan provided no documentation at all regarding his development of land values. All I am able to do is provide some examples of how inexplicable his process was.

One example involves the dramatic inconsistencies within his land curves at the larger acreages. Chart 8 shows the same curves that appear on Chart 2, but extended out to six acres.



As is obvious from the chart, these curves have enormous discontinuities at 1 acre, 2 acres and 5 acres. As a specific example, the value at 1.00 acre in Heathcote is \$1,495,000, and the value jumps to \$2,091,563 at 1.01 acres. This means the incremental one-hundredth of an acre (435.60 square feet) is valued at \$596,563. At the August 17, 2016, meeting, I showed John Ryan the underlying curve and stated that he could have smoothed it out. He said, “I don’t disagree with you”, but he still did not explain the derivation.

Obviously, most Scarsdale residential properties are less than one acre and thus not affected by these anomalies, but this one chart alone makes the point that the derivation of Ryan’s numbers cannot be explained based on observed data.

Another Ryan example involves his handling of Butler Road in Fox Meadow. Butler Road has 28 single family residences, of which 17 have an Influence Factor of 1.20 due to “Location”, causing the land value to be 20% greater than the standard curve value. Another two are at 1.15, thus 15% above the standard. Most of the other Butler Road properties are very close to Fox Meadow Elementary School or to the Bronx River Parkway.

However, in all of the rest of Fox Meadow, there is only one other property with an Influence Factor above 1.10. There are 56 properties at 1.05 and 1.10, and all the other properties are at 1.00 or below.



So, on what basis could Ryan have been so certain that the fair market value of Butler Road land is 20% greater than the same acreage in most of the rest of Fox Meadow? There were only two Butler Road sales in his published sales base, hardly sufficient statistically to make this generalization. The Tyler data does not show any such special treatment of Butler Road, and certainly not a 20% premium on land value.

Is it possible that this was based on guidance from experienced staff in the Assessor's Office? I asked the Assessor and these Butler Road Influence Factors were entirely from Ryan. Were John and Gerd just able to tell from driving by that Butler Road land is worth a 20% premium?

I can provide other examples of unexplained Influence Factors and Traffic Factors, but I do not want to further clutter up this memo.

Finally, beyond the "historical" question of how the values were calculated, there is the ongoing question of how the Assessor can rely on any of these values going forward with no understanding of how any actual data supports them.

**Conclusions and Suggestion.** I hope I have made the point that land values had a dominant impact on total values in the Tyler and Ryan revals, were handled differently by the two vendors and were not well explained.

This are certainly lessons to be learned here for future revals if Scarsdale decides to pursue one, although I am not advocating a future reval.

But even without another reval – and even without a near-term expectation of changing anyone's values – I suggest that the Assessor and her office develop their own sense of the relative values of land and land related attributes in different parts of Scarsdale. If you are going to say that land values really are sensitive to the actual street, you might need ten years of sales data to prove that.

Michael Levine  
July 5, 2017