The importance of reconciliation in tree appraisal: Part 1 of 2

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Introduction

An often underutilized phase in the appraisal process is reconciliation. Appraising arborists often just pick a method (often the trunk formula method) and give a cursory footnote in their appraisal report stating why they didn't use any other methods of appraisal. Rather, the reconciliation phase is an important part of the appraisal process. While the many techniques of appraisal are designed to be mechanical and prescriptive, the reconciliation process gives the necessary subjective discretion for the appraising arborist to point to the value of the subject tree that applies to the appraisal assignment.

Reconciliation should be thorough, thought-out, and well-reasoned. It should make up the bulk of a report, rather than being a short footnote or quick paragraph in the conclusion. An ideal reconciliation section of a report should address all of the techniques used in the appraisal, and it should give justification for each one. It should explain why one or more of the values were rejected, and it should explain in detail why certain values were weighted more strongly than others.

In this two-part article series, I provide three examples that illustrate the importance of the reconciliation phase. This article assumes the reader has basic familiarity with the various techniques of appraisal. I begin each scenario where many arborists stop: after the various appraisal techniques have been calculated.

An ideal reconciliation section of a report should address all of the techniques used in the appraisal, and it should give justification for each one.

Techniques used in the appraisal scenarios in this article

1. **Property Value Difference Technique**: This technique compares two existing real estate parcels with recent sales transactions. One parcel contains the subject tree, and the other is identical to the first, except it does not contain the subject tree. The difference between the two property values is the solution.
2. **Direct Market Value Technique**: If the tree can be sold directly for some value either for board-feet of lumber or transplant to another site, an estimate is calculated for what that sale price would be.
3. **Income Approach**: the present value of the expected future benefits is calculated. Future benefits can be from saleable goods such as fruit production, or they can be indirectly calculated benefits such as those listed in the iTree benefits calculator.
4. **Market Value Percentage Contribution Technique**: This method compares the contribution of a subject tree to the landscape's overall value and then compares that to the market value added by the whole landscape to the real estate parcel.
5. **Reproduction Cost Trunk Formula Technique**: using the trunk formula to calculate the cost solution for an identical reproduction of the subject tree.
6. **Functional Replacement Trunk Formula Technique**: using the trunk formula to calculate the cost solution for a functionally equivalent tree.
7. **Reproduction Direct Cost Technique**: cost of a contractor to install an identical reproduction of the subject tree.
8. **Functional Replacement Direct Cost Technique**: cost of a contractor to install a cheaper, functionally equivalent tree.

Scenario 1

An oak tree grows in the center of the front yard of a single family residence in an upper middle class neighborhood with median property values of $400,000.

Suppose the following appraisal techniques have already been employed for the subject tree:

Scenario 1	Middle Class Front Yard
Appraised Solution	Technique
$0.00	Property Value Difference Technique
$300.00	Direct Market Value Technique
$1,200.00	Income Approach
$8,000.00	Market Value Percentage Contribution Technique
$10,000.00	Functional Replacement Trunk Formula Technique
$20,000.00	Reproduction Cost Trunk Formula Technique
$20,000.00	Functional Replacement Direct Cost Technique
$75,000.00	Reproduction Direct Cost Technique

Regardless of the assignment, the following observations should be made about the data:

- The cost of directly replacing the tree with a functional equivalent is the same as the trunk formula technique cost solution.
- There was insufficient data to tease out a difference in property value as a result of the tree.
- The sale of the tree as lumber does not yield much.
- As a percentage of the landscape, the tree contributes significant value to the property.
- Reproducing an identical tree is much more expensive than the other proposed cost solutions.

Now consider the following possible assignments for this appraisal:

1) Insured Loss: Suppose the assignment was to assess the replacement cost of the tree for an insurance claim. The policy provides for the replacement cost of a given loss, including landscape features such as trees. Any four of the cost solutions could potentially be useful for appraising for this insurance claim, but that does not necessarily mean that none of the other appraisal techniques are useful.

Because the direct reproduction cost is much greater than either of the other three cost techniques used in the appraisal, it can be rejected as an outlier. Although the tree can be directly replaced for a large sum, an equivalent tree can be replaced at a much lower cost. This leaves the functional replacement direct cost technique and the two remaining trunk formula techniques as possible cost solutions.

Although the policy does not cover the market value of a tree, it can still be used as a test of reasonableness. The landscape percentage contribution technique shows that the tree contributes $8000 to the landscape value, and the property value difference technique didn't show any contributory market value. This suggests that the functional replacement direct cost and reproduction trunk formula techniques should be rejected as outliers because they are not reasonable relative to the market value of the tree. This leaves only one reasonable cost solution: the functional replacement trunk formula technique.

The purpose of insurance is to make an insured whole after a loss. If the insurance company were to provide funds for an identical reproduction, then the property owner could repair his loss by spending a portion of the funds on a functional replacement and then profit the difference. Incorporating market value into a cost appraisal can give a more justifiable cost solution.

2) Construction Bonding: Suppose the assignment was to assess the value of the subject tree for construction bonding purposes. The city containing the subject property has a tree protection ordinance in effect that requires property owners to post a bond for the replacement cost of any trees that may be affected by the construction. If the bonded tree dies as a result of construction activity, then the property owner must pay the city the amount of the bond.

At first, it may seem that this assignment is very similar to the insurance claim assignment. Both are assessing the replacement cost. However, the intention of the tree protection ordinance is different. While the intention of an insurance policy is to make a property owner whole after a loss, the intention of a tree protection ordinance is to preserve the existing trees in the landscape. Market value plays less of a role in determining the appraised replacement cost of a tree for the purpose of construction bonding.

The income approach may be rejected outright because the tree protection ordinance was enacted specifically because the calculable monetary benefits from the trees are insufficient justification for their protection. The citizens who supported the tree protection ordinance felt that the trees provided benefits that were not fully captured or described by the income or market approaches. Therefore, these techniques can be rejected, leaving the four replacement cost techniques.

The functional replacement techniques can be rejected because the intention of the tree protection ordinance is to retain the native and historic trees. Using the functional replacement technique would imply that the existing stock of native species may be diluted with cheaper species that provide the same landscape function. This leaves the reproduction cost methods: the direct cost technique and trunk formula technique.

It's important to note that the functional replacement method would be calculated using costs from less expensive trees and not necessarily the protected tree species. Although these cheaper trees would not be functional substitutes for the city ordinance, they would still be functional substitutes for the intention they were planted on the residential property or for the intention they were given by association with the built environment. The inadequacy of the functional replacement method would be explained here in the reconciliation phase and not with adjustments to the calculations of the functional replacement method.

Between the two reproduction cost techniques, the trunk formula technique is more appropriate. The trunk formula technique models the reproduction cost as if the tree were grown by a nursery. If a replacement tree eventually grew to the size of its predecessor, then it would still have the same value for the city as far as the intention of the tree protection ordinance goes. Conversely, the city does not necessarily require the instant gratification of an immediate replacement tree.

Tree protection ordinance fines are usually placed in either the general fund or a specific account for managing the city's stock of trees. Rarely are they actually used to plant a direct replacement on the same site of the recently deceased or removed subject tree. Therefore, an appraisal that better reflects the allocation of the funds would be one that assumes scalable long-term management of the entire city's stock. The best choice is the reproduction cost trunk formula technique.

3) Market Value Added: Suppose a property owner was concerned about the loss to the market value of his property if he were to remove the subject tree for a construction project. The assignment would be to assess the contributory market value of the tree for the property.

The direct market value technique may be rejected because the tree's contribution to the market value of a residential property is not driven by the timber value. Rather, the primary drivers are mostly the aesthetic and functional benefits of the tree. These are both reflected in the market approach and in the income approach, so both should be considered.

The property value difference technique resulted in zero value added. This supports the conclusion that removing the tree for the construction project would not significantly harm the property value. However, the presence of a well-groomed landscape does affect market value, and the tree contributes a certain percentage of that landscape value. This suggests that the market value added by the tree is greater than zero. The income approach also reflects a projected future stream of benefits provided by the tree that may be incorporated into market pricing of the whole property. Any of the three aforementioned techniques could potentially be used for this appraisal.

If the property owner were anticipating refinancing his house in the future, he could potentially use the property value difference technique. Single family residence appraisers often don't place any value on the tree by comparison with other recent sales, so the removal of the tree wouldn't may not affect the property's appraisal for the refinance. Therefore, the zero-value conclusion could be justified.

If the property owner were anticipating selling his house in the near future, then the appraised value of his property by sales comparison would be less relevant than the premium that buyers would be willing to pay for an aesthetically pleasing landscape. In this case, the market value percentage contribution technique might be the most relevant.

Lastly, if the property owner were anticipating renting his house out to a tenant in the near future, then the income approach may be more relevant to his decision because the higher rent he could charge would have an impact on the bottom line profit from the property. Also, if the rent stream would be higher, the difference in rent should be discussed in the appraisal report because that would have relevance if the property owner intended on refinancing after establishing a history of high rents – a larger loan could potentially be obtained based on the increased income alone, even without an increase in the market value of the property.

Although the replacement cost techniques do not carry much weight in this appraisal assignment, they should still be included in the report because these cost solutions are still useful to the property owner. With the cost approach methods, the property owner knows how much it will cost to "put it back" if he later decides that a tree is an important aesthetic element to the landscape. With the trunk formula techniques, the property owner gets a feel for how much it would cost to grow a smaller tree into the size of the subject tree. With the direct cost techniques, the property owner knows how much it would cost to replace subject tree with instant gratification. All of the relevant uses for the data should be discussed in the reconciliation phase of the appraisal report.

4) Litigation: Suppose now that the neighbor maliciously chopped down the subject tree. The property owner wants to file a lawsuit for damages caused by the neighbor. The assignment would be to assess the loss. Again, this assignment may seem similar to the insurance claim assignment because both have the intention

of making the injured party whole. However, in this assignment, the appraising arborist has the discretion of accounting for intangible losses as well.

With this assignment, the appraising arborist should make sure to give justifications for all of the appraised values and costs from all of the techniques employed because he is not the ultimate decider of the award – that is the job of the judge if the case is brought to trial. Although the final conclusion is useful to aid the judge and the parties involved in decision-making, the ultimate decision of the award amount is up to them, not the appraising arborist.

The property value difference technique has been argued as a both a valid and invalid appraised value conclusion in litigation. The theory is since the subject property would not be sold at a loss as a result of removing the tree, then the value of the tree is zero and no loss has occurred. Case history varying over time and between the states provides examples of judges both accepting and rejecting these arguments. More recent case history suggests that a zero valuation may be rejected because a precedence of zero valuations would erode property owners' rights. Either way, the technique should still be included in the report – it is not up to the appraiser to decide upon the final award amount. In this case, since the removal of the subject tree was done with malice and the subject property owner did not show any intention of eventually removing the tree, the market approach may carry less weight than the cost approach.

The direct market value technique may still be relevant in litigation depending on the case. Timber value lost could potentially be a measure of damages, even if the tree was not originally grown for that purpose. Timber value technique may receive less weight in the final appraised conclusion of this assignment because there may be other more applicable methods of showing loss.

The income approach may also receive less weight in a case of loss because it relies on projecting future streams of benefits. The litigation assignment is concerned with the immediately realizable loss in value the moment the damage occurred. What might be relevant is if the property lost rental income due to the loss of the tree then the replacement cost could be justified if it were to restore the rental income premium earned by the property with a tree. Even though the income approach may not be used directly in the final concluded value, certain components of it may still be relevant to the case.

Both replacement cost methods can be defended as valid. The functional replacement method may carry more weight for the same reasons stated in the insurance assignment. Why pay more when a cheaper substitute is available? However, it may also be rejected because it does not capture the full value created by the tree. If it can be argued that the intangible loss of value to the property owner was greater than the cost of reproduction, then the reproduction method may be shown to be the less-expensive option for appraising damages.

For either of the replacement cost methods, the trunk formula technique could be defended as valid because it reflects the cost of reproducing a given tree (of identical or substitute species) at market production costs. A prudent buyer would not pay more than the minimum necessary production costs to procure a tree. Conversely, the direct cost technique could be defended because it does not require a multi-decade time delay before parity is achieved. The subject tree was lost, so a new one must be installed in a reasonable time, or else the full extent of the loss has not been covered. On the other hand, it could also be argued that the trunk formula technique is better than the direct cost technique because the direct cost technique confounds the true market value with a premium for obtaining the tree sooner. On a time scale of tree growth, decades are short time periods, so using the direct cost technique would include the premium the buyer wants to pay for to minimize the time without a tree.

The appraising arborist may note that for this appraisal, the functional replacement direct cost technique is the same as the reproduction cost trunk formula technique. Evidence of the reasonableness of this value is more than one technique resulted in the same amount. Since the reproduction direct cost is so much higher than the alternative cost techniques, it may be rejected as an outlier, containing a premium for instantaneous replacement of a specific species.

If it could be shown that the subject tree carried any significant intrinsic value to the property owner, then a conclusion of $20,000 for the reproduction cost trunk formula technique would be reasonable. The cost approach is the most heavily weighted approach, and the trunk formula technique passed a test of reasonableness because it is the same as the cost of directly replacing with a functional equivalent. If it cannot be shown that the tree carried any intrinsic value, then the same concluding value could be defended, but with the functional replacement direct cost technique instead.

All of these possible conclusions should be discussed and addressed in a complete appraisal report. One may be chosen and defended as the concluding appraised value in the report, but any of them may be chosen by a judge at trial to use as the final award.

Scenario 2

A historic specimen tree grows in the back yard of a residential property in a working class neighborhood with median property values of $130,000.

Suppose the following appraisal techniques have already been employed for the subject tree:

Scenario 2	Replacement Cost is More than Property Value
Appraised Solution	Technique
$1,000.00	Property Value Difference Technique
$300.00	Direct Market Value Technique
$1,200.00	Income Approach
$1,000.00	Market Value Percentage Contribution Technique
$70,000.00	Functional Replacement Trunk Formula Technique
$70,000.00	Reproduction Cost Trunk Formula Technique
$250,000.00	Functional Replacement Direct Cost Technique
$250,000.00	Reproduction Direct Cost Technique

Regardless of the assignment, the following observations should be made about the data:

- The cost approach gives much higher appraised cost solutions than any of the other appraisal techniques.
- The marketplace of the subject property's neighborhood does not place much value on the tree or on its contribution to the landscape.
- The two techniques of the market approach resulted in the same appraised market value for the tree.
- Directly replacing this tree costs more than the real estate is valued.
- There is no cheaper functionally-equivalent tree. The functional replacement tree is the subject tree itself, so the functional replacement and reproduction cost methodsboth result in the same cost solutions.

Now consider the following possible assignments for this appraisal:

1) Insured Loss: Suppose the assignment was to assess the replacement cost of the tree for an insurance claim. The policy provides for the replacement cost of a given loss, including landscape features such as trees.

At first, it would seem that the best appraisal technique would be one within the cost approach. However, in this case, the test of reasonableness changes the appraised loss. There is a drastic inequality between the cost approach and the market and income approaches, suggesting that the cost approach does not best represent the amount of loss incurred by the property owners.

While insurance is designed to make property owners whole after a loss, it does not incorporate intrinsic or emotional value into its loss appraisals. Only measurable monetary losses are covered by insurance, so if the market and income approaches don't substantiate a cost-based appraisal, then an alternative technique must be utilized.

The market value percentage contribution and property value difference techniques both support each other by being close together. They are further supported by the income approach, appraising within 20% of their values.

It would seem that basing the conclusion off the market or income approaches would be doing injustice to an economically inhibited area. Rather, this is an opportunity for the arborist to use subjective discretion in the reconciliation process. It could be argued that the market and income approaches are too low *and* the cost approaches are too high. Therefore, a middle value could be determined by appropriate weighting of the relevant appraisal techniques. In this case, an appraiser may weigh the market approach more heavily, and choose a value of $10,000. This would not fully compensate for the replacement of the subject tree, but it would be a sufficient amount to produce a new tree that would still have a significant contribution to the landscape.

Another important factor in an insurance claim is the policy language. If the language specifies the amount to be paid is the replacement cost, then the market and income approaches may be excluded. If the policy language does not specify an approach, then the market and income approaches may be relevant to the appraisal.

Regardless of whether the insurance company or the property owner commissioned the appraisal report, the conclusion would be the same. But each respective side may use the appraised values in different ways. The property owner may argue that the lowest-cost functional replacement would be the minimum compensation. The insurance company may argue that the highest market value amount would be the maximum compensation. But the independent appraising arborist would not be involved in advocating for either side of that dispute – the appraisal report would stand alone and contain justification for both methods of the appraisal.

2) Construction Bonding: Suppose the assignment was to assess the value of the subject tree for construction bonding purposes. As stated in the previous scenario, the cost-approach is more reasonable than the market or income approaches because the city intends on preserving the existing tree stock, not allowing free market

forces to dictate which trees may be preserved. Within the cost approach, the functional replacement and reproduction cost methods are the same, so both are reasonable relative to each other. Also as stated earlier, the trunk formula method would be more appropriate because the city does not allocate the revenue generated by issuing fines to instantaneous replacement of lost trees. Rather, it allocates the revenue over its entire replanting program. Therefore, the reproduction cost trunk formula technique would be the most appropriate appraisal for this assignment.

Although this is a relatively simple reconciliation, the discrepancy between the cost approach and the market and income approaches should still be discussed in the appraisal. It is possible that future litigation between the property owner and the city could opine that the fines are "unreasonably high," and the appraisal report could be justification for that argument. Although the tree would be appraised with the reproduction cost trunk formula technique for this assignment, the work done for this appraisal report may justify an entirely different conclusion in the future.

3) Market Value Added: Suppose a property owner was concerned about the loss to the market value of his property if he were to remove the subject tree for a construction project. The assignment would be to assess the contributory market value of the tree for the property.

Again, this would be a relatively simple reconciliation. Both market value techniques resulted in the same appraised value, so they support each other as reasonable. The direct market value technique would receive little or no weight, and the appraised value of the tree for this assignment would most likely be $1000.

The cost-approach techniques should still be included so the property owner has a reference point for how much it would cost to bring the landscape back to parity following construction. That information is relevant to the report reader because it may affect the decision of whether to move forward with the project or to rethink the plans. If only the market approach were included in the report, then the property owner would be led to believe that since the tree was not worth much it would be easy to replace, too.

4) Litigation: Suppose now that the neighbor maliciously chopped down the subject tree. If the property owner did not show any intention of removing the subject tree, then it would be reasonable to ask for a replacement. To address the large discrepancy between market and cost appraisals, a middle value between the two could be chosen. For this case, it may be appropriate to give more weight to the cost approach than in the insurance appraisal to account for the emotional and personal value associated with the tree. As a test of reasonableness, the appraised value should not be greater than the cost of replacement.

Scenario 3

A bottlebrush tree is growing in the front yard of a residential property in a Southern California neighborhood with median property value of $600,000. Bottlebrush trees have high unit-costs in the Western Region's Species Classification Guide, resulting in relatively high unit trunk formula technique appraisals. They are also popular trees for their aesthetic qualities. Suppose that to respond to demand, nurseries have begun to produce very large specimens for transplanting, and it is relatively easy to locate and install a large replacement bottlebrush tree.

Suppose the following appraisal techniques have already been employed for the subject tree:

Scenario 3	Direct Replacement is Cheaper
Appraised Solution	Technique
$0.00	Property Value Difference Technique
$300.00	Direct Market Value Technique
$1,200.00	Income Approach
$8,000.00	Market Value Percentage Contribution Technique
$30,000.00	Functional Replacement Trunk Formula Technique
$50,000.00	Reproduction Cost Trunk Formula Technique
$20,000.00	Functional Replacement Direct Cost Technique
$30,000.00	Reproduction Direct Cost Technique

Regardless of the assignment, the following observations should be made about the data:

- The direct cost technique is less than the trunk formula technique for both cost methods.
- The cost approach still appraises the tree significantly higher than either the market or income approaches.
- Functional replacement trees can be acquired less expensively than reproductions.

Now consider the following possible assignments for this appraisal:

1) Insured Loss: Suppose the assignment was to assess the replacement cost of the tree for an insurance claim.

Since directly replacing the subject tree is less expensive than either of the

trunk formula methods, the trunk formula technique can be rejected outright. Not only is the trunk formula technique not the prudent choice for appraisal, it also carries a lower level of precision than the direct cost techniques. The trunk formula technique is a projection of costs by unit area, so it is less precise than actual quotes from contractors.

The decision for the insurance company then is to choose between the functional replacement direct cost and the reproduction direct cost. In this case, the functional replacement direct cost technique would be the most appropriate choice for the appraisal. The property owner would receive funds to restore the landscape function of the lost tree, and the appraisal would be supported by strong evidence of real quotes from large tree nurseries.

The market and income approaches would be rejected as options for appraisal, but they still help to justify the choice of a given appraisal technique. In this case, the market and income approaches were significantly lower than the cost approach, so the choice of the lowest cost technique can further be bolstered by this test of reasonableness. The market value percentage contribution technique is high enough that it bridges the gap between the lower appraised values and the cost approach. If the percentage contribution were more in line with the income approach, then it may be appropriate to use a middle value between the cost approach and the market and income approaches. In this case, the market value percentage contribution is sufficiently high that no middle value need be used.

2) Construction Bonding: Suppose the assignment was to assess the value of the subject tree for construction bonding purposes.

Usually the reproduction cost trunk formula technique would be used for this purpose, but in this case the direct replacement technique results in a lower appraised replacement cost. By the principle of substitution, it is better to pay less for a tree now than pay more for a tree that would grow to maturity after many decades. Therefore, the trunk formula technique can be rejected. The most appropriate method of appraisal for this assignment is the reproduction direct cost technique.

3) Market Value Added: Suppose a property owner was concerned about the loss to the market value of his property if he were to remove the subject tree for a construction project. The assignment would be to assess the contributory market value of the tree for the property.

The property value difference technique resulted in a zero value, but it is not a very precise technique of appraisal. The market value percentage contribution technique does a better job of showing value created by the subject tree. It could potentially be concluded that this is the best technique for appraisal.

For a more complex argument, it could also be argued that the market value percentage contribution technique results in too high of an appraised value relative to the other market and income techniques. By the test of reasonableness, this value may also be rejected. Therefore, a middle value may be determined somewhere between the income approach and the market value percentage contribution technique.

It does not matter for the selection of which approach is used in this assignment whether the direct cost technique results in a greater or lesser cost solution than the trunk formula technique. However, this cost information is relevant to the property owner and may be included in an appraisal report if the property owner is considering replanting following construction.

4) Litigation: Suppose now that the neighbor maliciously chopped down the subject tree. Just like in the previous scenarios, any of the approaches could be argued. However, within the cost approach, the trunk formula technique should be rejected outright because the direct cost technique provides a replacement immediately and with clear supporting evidence from contractor quotes. It is also likely that the property value difference technique will be rejected when determining an award amount.

The functional replacement direct cost technique may be the best technique for this appraisal report. The market approach does not substantiate losses greater than $10,000, so the reproduction direct cost technique may be rejected. This leaves a discrepancy between the market value percentage contribution technique and the functional replacement direct cost technique. It might be fair then to find a middle value between the two, or the functional replacement direct cost technique could be used without any adjustment.

Conclusion

As shown in the preceding scenarios, the reconciliation phase of appraisal plays an integral role in formulating a defensible appraised value. Reconciliation gives the appraising arborist the opportunity to defend the concluded value by comparing it to the alternatives. It also provides discretion to introduce adjustments to help the calculated values better reflect the final appraised value.

The assignment is a large determiner of how the final appraised value will be reconciled.

Although the assignments discussed were the same across all of the six scenarios, they still resulted in different appraisal techniques for each scenario. Appraising arborists should be acutely aware of the intended use of their appraisal, and the assignment should be cleanly documented in unambiguous language to prevent disputes later.

Although certain assignments tend to use certain appraisal techniques, it is always important to include all of the relevant techniques. As was shown in several examples, these alternative values may be rejected as final values, but they can be used to

help justify decisions that are made in the reconciliation phase. Appraisers should make sure to pay attention to the reconciliation phase because it may make the difference between a thorough appraisal report and one that is incomplete.

The next article in this series will take a look at three different scenarios.

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