In response to several comments received regarding the January/February 2025 article "Partial Taking Valuations: Part 1," written by Scott B. Arens, MAI, SRA, and Daniel M. Kane, IRWA's International Valuation Committee felt obligated to respond. Before proceeding any further, it is important to acknowledge and understand that the opinions and views expressed in the articles contained in Right of Way Magazine are those of the cited authors and their quoted sources. Those articles do not necessarily reflect the views, policies, or positions of the International Right of Way Association, its employees, officers, leaders, or membership. Furthermore, the article was published without the benefit of peer review. With this understanding, this article emphasizes that the opinions and views expressed in the January/February 2025 article, "Partial Taking Valuations: Part 1," and March/April 2025 article, "Partial Taking Valuations: Part 2," are those of its authors and not of IRWA nor the International Valuation Committee.

These articles touched on the objective reality that diminishing marginal returns exist. As size increases, the value per unit tends to decrease. However, the fundamental flaw in the argument is that the *value of a taking is calculated by multiplying the quantity acquired by the before unit value*. As the Arens-Kane article points out, when the methodology is dictated by law or custom, appraisers usually need to comply with this accepted convention.

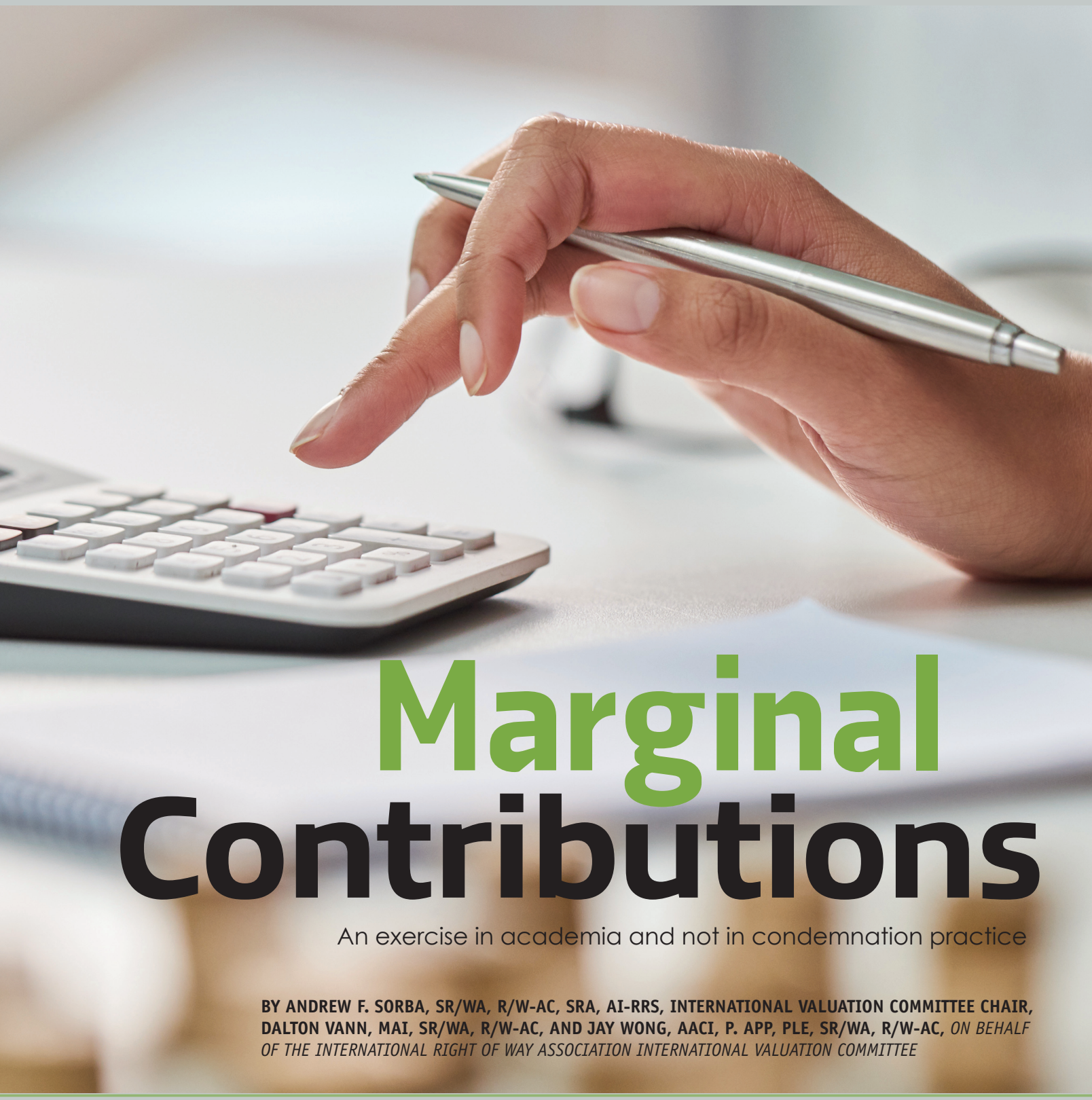
Readers of the Arens-Kane article would do well to appreciate the matter of consistency it presents. If the appraiser adjusts comparables for differences in land size to appraise the property *before* an acquisition, it is logical to apply a complimentary adjustment for size *after* the acquisition. The article would have benefited from focusing on the potential for *increasing marginal returns* to the remaining land value due to a reduction in land size, instead of the marginal contribution of the acquisition. Respectfully, the Arens-Kane article *errs* in applying marginal contribution principles to value of the part taken in a before-and-after scenario. The primary question in such a scenario is: what is the difference in value before and after? The contributory value of the part acquired is *not* part of the scope of work when following the before-and-after method.

Flawed Premise

"Partial Taking Valuations: Part 1" commented that "When doing a partial interest valuation, the presence of decreasing returns profoundly changes the required methodology. Failing to understand and address these changes can result in conclusions that are not just wrong but often terribly wrong."

This statement is *incorrect*, as it did not recognize that when evaluating a partial taking, 1) the acquisition is almost never a marketable parcel on a standalone basis and 2) the value of the acquisition as part of the larger parcel is not only fair but accepted in many jurisdictions throughout the U.S. as well as other countries. In fact, the before-and-after method is not accepted outside the U.S. and is considered to be unfair to the affected owner.

The Arens-Kane article stated that the "Correct Math" is to recognize the incremental marginal contributory value. The example that is mentioned regarding the strip of land is a classic case where the methodology in the article fails and is wrong in other contexts. If the strip that is being taken is a particularly valuable section of land, like "commercial frontage," simply assessing its "marginal contribution" is misleading and wrong.



Marginal Contributions

An exercise in academia and not in condemnation practice

BY ANDREW F. SORBA, SR/WA, R/W-AC, SRA, AI-RRS, INTERNATIONAL VALUATION COMMITTEE CHAIR, DALTON VANN, MAI, SR/WA, R/W-AC, AND JAY WONG, AACI, P. APP, PLE, SR/WA, R/W-AC, *ON BEHALF OF THE INTERNATIONAL RIGHT OF WAY ASSOCIATION INTERNATIONAL VALUATION COMMITTEE*

Validity of Diminishing Marginal Returns

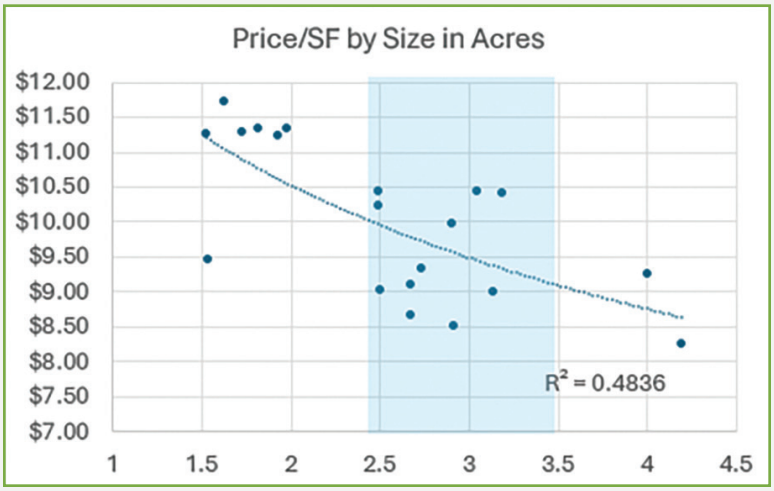
The concept of Increasing or Diminishing Returns is often termed a "law" because it captures the market reality that after peak value is reached, adding an additional unit of land size often results in a smaller proportional increase in value. Appraisers sometimes term this concept as "size regression"[1] since it is most often evident in changes in value due to changes in land size. As size increases, the value per square foot or acre will often decrease, although not universally true. For example, if the land increases in size by 10%, the value may increase by less than 10%. This is the reason appraisers make size adjustments in their grids. Diminishing marginal returns is also an important consideration in the Cost Approach. A lower unit price is often applicable to large quantities of construction materials. However, when small quantities must be replaced in a Cost to Cure analysis, a higher unit price may be applicable.

It is also true that the appraiser should use the same logic to adjust sales before and after an acquisition. So, taken at face value, if an appraiser makes a size adjustment to comparables used to value the property before an acquisition, a size adjustment should also be made to the same comparables if used to value the property after.

Practicality and Evidence

The Arens-Kane article points out how market data is imperfect, and the principle is illustrated using "perfect" data. Appraisers often do not make precise size adjustments when the market does not support small adjustments for land size. *The appraiser should mirror the market based on adequate evidence.*[2] Often size adjustments are only made if the differences in size are substantial enough for the market to adjust the unit price. For example, when buyers and sellers agree upon the purchase price of land, they generally do not change the agreed price after the land is surveyed to determine its precise size. This is evidence that the market does not adjust for small changes in land size.

Instead of a perfect dataset, take the following dataset of land sales plotted by price per square foot relative to size in acres.



Observations:

1. There is a large variance between high and low price points even for tracts of similar size. This means the trend line doesn't fit the data well, and is therefore, poor support to quantify a small size adjustment

2. Sales from 1.5 to 2.0 acres all seem to trade for about the same price per square foot, excepting an outlier. Similarly, sales around 2.5 to 3.0 acres have a wide price per square foot range, yet their prices are all grouped below the previous size range.

Therefore, size adjustments from one size category to another are better supported, but small differences in size are poorly supported. This is why appraisers often adjust based on the number of doublings in size.

Contributory Value of the Acquisition

IRWA recently published the 5th Edition of "Principles of Right of Way" (PoRW), which is authored and edited by teams of dedicated professionals in the industry. Page 53 of PoRW defines the value of the part taken.

Since the highest and best use of a portion of the larger parcel that is acquired by condemnation or expropriation is as part of the whole, its value is calculated by multiplying the quantity acquired by the before unit value.

"Real Property Valuation in Condemnation," published by the Appraisal Institute, uses the term value of the "part taken as part of the whole" 11 times when applying the unit value before to the size of the acquisition. The International Valuation Committee is unaware of any jurisdictions that follow the Summation (State) Method who define the value of the part acquired based on its marginal contribution. "Real Property Valuation in Condemnation" goes on to address the scenario of highway frontage land where the front is worth more than the back.[3] The text cites three ways in which courts have valued a loss of 8,000 square feet of front land from a property of totaling 40,000 square feet.

- In *City of Los Angeles v. Allen*, a California court took the weighted average price per square foot of the front and the back to value the part taken and used the *same* unit values to appraise the remainder After.

- Following the methodology in *State Department of Highways v. LeDoux,* the Louisiana court would apply a higher value per square foot to the front, and the *same* value per square foot to the property After the acquisition as before.

- Even in the example provided for the federal method (before and after), the *same* unit values were applicable to appraise the property before and after.

In no case was the unit value after of each zone *increased* due to a loss in size. In *each* case, the methodology is dependent upon the jurisdiction. And in no case was the marginal contribution of each square foot of land considered within the zones/bands of value.

Bands of Value were recently discussed in this publication's July/August 2024's "Ask an Appraisal Reviewer" column, "How Can Size and Shape Impact Market Value After the Taking? Do these Changes Damage or Benefit the Remainder? Or Both?" by authors David Burgoyne, SR/WA, and Brian O'Neill, SR/WA. The following is an excerpt of David's answer from the article,

> *"As appraisers, particularly as right of way appraisers, we often think in terms of "Bands of Value." In partial takings, we often need to determine different unit values for different parts of a subject property (the larger parcel). If one is appraising a farm (for anything other than a partial taking) that is 80% tillable and 20% woods, if that 80/20 ratio is typical for our market and our comparable sales, then one can use a blended rate per acre of the farm, and there is no need to put a separate unit rate on tillable acreage and on woods. However, in a partial taking, where the take could be all woods or be all tillable, it is necessary to establish different unit rates for these "Bands of Value" to properly value the part taken (which may not be divided typically or like the balance of the parcel)."*

The Arens-Kane articles do not directly discuss Bands of Value or the economic theory of optimal size. However, through the article's canned beverage example, we can see the same principles at play but incorrectly applied. The article discusses a 6-pack with a price of $7.50 or $1.25/can and a 12-pack with a price of $12.00 or $1.00/can. The article would lead the reader to believe the first six cans contribute $7.50 of value, and the second six cans contribute $4.50 of value. However, there are not two 6-packs in every 12-pack, and we cannot say there is a 6-pack "zone of value" in the 12-pack. If there is *one* 6-pack zone of value in the 12-pack, then there must be *two* 6-pack zones, yet a 12-pack does not cost $15.00 (the cost of two 6-packs). Therefore, every can must have the same unit cost in each pack. We must follow the Unit Rule, so if land is acquired from the 12-pack-like land, unit is worth the same amount because the market would only buy the 12-pack as a 12-pack. If anything, the example validates the average price per unit should be applied to each can.

The Benefit Offset Rule

As a matter of practicality, such situations are already difficult enough to comprehend without adding marginal changes in price per square foot. Furthermore, in jurisdictions that follow the summation method, marginal changes in land value rarely matter to the compensation estimate due to the benefit offset rule. The article implies that the acquisition results in a benefit (increase in price per square foot). Let's illustrate the matter using the example provided in the Arens-Kane article, first following the summation (state) method and then the before-and-after (federal) method.

Summation Method

	Size (SF)	Price/SF	Value
A. Before Acquisition	10,000	$10.00	$100,000
B. Acquisition as Part of the Whole	1,000	**$10.00**	$10,000
C. Remainder as Part of the Whole (A.-B.)	9,000	$10.00	$90,000
D. After Acquisition, Disregarding Benefits	9,000	$10.00	$90,000
E. Damages (C.-D.)			$ 0
F. After Acquisition, Considering Benefits	9,000	**$10.50**	$94,500
G. Benefits (D.-F.)			($4,500)
H. Net Damages/Benefits (E.-F.)*			$ 0
Appraised Compensation (B.+H.)			**$10,000**

*Cannot be less than zero

Following the accepted definition for the value of the acquisition as the size of the part acquired multiplied by the before unit value yields the "contributory" value of the part acquired. The summation method also allows for an increase in the unit value of the land after. This is known as the "Value of the Remainder After Considering Benefits." However, in the summation method, benefits (an increase in value) can only offset damages and not the value of the acquisition. Therefore, the compensation estimate is still $10,000 regardless of the "benefit."

An argument could be made in the summation method, that if the optimal site size was 8,000 square feet (the smallest lot identified in the article) and contributed $88,000 in the before, and a 10,000 square-foot lot such as the subject was valued at $100,000, the surplus 2,000 square feet have a contributory value of $12,000. An acquisition of 1,000 square feet from the surplus land and the remaining 1,000 square feet of surplus land would each contribute $6,000 as part of the whole. Thus, the "After Value, Disregarding Benefits" would be $94,000, the original $88,000, and the remaining 1,000 square feet of surplus land. The appraised compensation would be $6,000.

Let's repeat the same valuation from the first Arens-Kane article using the before-and-after method.

Before-and-After Example

	Size (SF)	Price/SF	Value
Before Acquisition	10,000	$10.00	$100,000
After Acquisition	9,000	$10.50	$94,500
Difference	**1,000**		**$5,500**
Allocation of Value:			
Acquisition as Part of the Whole	1,000	$10.00	$10,000
Damages			$0
Benefits			**($4,500)**

If market evidence suggests that a reduction of 1,000 square feet results in a $0.50 per square foot increase in unit value, *then this is truly the difference in value before and after.* The fundamental questions become:

1. Does the jurisdiction consider an increase in unit value due to a reduction in land size to be a special benefit?
2. What is the offset rule for that jurisdiction? (See page 31 of *"Real Property Valuation in Condemnation"*)

Most significantly, appraisers *should* acknowledge the rare cases where sufficient local data are available to support an increase in the unit value of the remainder from *increasing marginal returns* (size regression) when benefits can offset the value of the acquisition.

As discussed in the summation (state) method, using bands of value and optimal site size, the before-and-after (federal) method could result in compensation of $6,000 if no benefits were identified and the acquisition is only of surplus land, as the article implied.

Closing Thoughts

While the Marginal Contribution approach is not recognized or appropriate in condemnation/expropriation partial acquisition valuation, it should be appreciated for its academic and thought-provoking merits. The authors should be recognized for presenting a novel approach, which has generated a strong response from the right of way community and readers of this publication. Right of way professionals are reminded to follow the applicable laws and regulations of the jurisdiction in which they provide services and that laws vary between jurisdictions.

The International Valuation Committee meets virtually on the third Thursday of every month at 12:00 p.m. (Pacific) / 3:00 p.m. (Eastern). If you'd like to learn more about the Committee, please contact the International Valuation Committee Chair, Andrew F. Sorba, SR/WA, R/W-AC, SRA, AI-RRS, at asorba@appraisalgroupnw.com. ✪

[1] Real Property Valuation in Condemnation. Appraisal Institute (Chicago, 2018). Pg. 71

[2] "Without adequate market data, the apparent precision of quantitative adjustments can convey a false sense of accuracy." Uniform Appraisal Standards for Federal Land Acquisitions. The Appraisal Foundation, 2016. Pg. 27 and 121.

[3] "Real Property Valuation in Condemnation" Appraisal Institute (2018). Pg. 27-28