Age Calculation

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Preface

In 2018, the Department of Revenue (Department) Manuals Team undertook a major project to update all publications produced by the Property Tax Unit. The following three levels of updates were to be applied, dependent upon the perceived need:

Review: Publication conforms to standard style and formatting. Legislative and other citations verified. No changes to content, methodology, policy, or practice.

Revision: Includes applicable Review processes. Publication is newly edited. Nonsubstantive legislative changes incorporated. Addition or deletion of information that does not alter valuation methodology.

Rewrite: Includes applicable Review and Revision processes. Major substantive changes made to any combination of content, valuation methodology, policy, or practice.

This publication is a Revision of the *Age Calculation* guideline published by the Department in 1995. It supersedes all previous age calculation publications issued by the Department and remains effective until replaced. Additional information may be issued as an addendum to this publication or as a separate publication. Due to the flexibility provided for in statute, deadlines and procedures may vary from county to county across the state. The Department recommends contacting your county assessor for detailed information regarding the deadlines and procedures in their jurisdiction. The information in this publication is based upon laws and rules in effect at the time of publication. Should any content in this publication conflict with current laws or rules, the latter shall be controlling.

Authority

Authority to produce this publication is found in Arizona Revised Statutes (A.R.S.) 42-11054(A). Regarding the weight of authority of this publication, see A.R.S. 42-13051(B)(2).

Practical Examples

All practical examples herein are representative of how the Department would apply a given set of data while adhering to both industry- and Arizona-specific guidelines as well as standard appraisal methods and techniques. Practical examples may demonstrate the current best practices used to make a necessary determination. Some practical examples may demonstrate the application of a process mandated by statute. See A.R.S. 42-11001(6). Other practical examples may demonstrate methods that are adaptable to the particular situations of the various counties. Specific calculations used in the practical examples found herein are for demonstration purposes only.

All inquiries, comments, and suggestions concerning the material in this publication may be submitted to the following:

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This publication may be accessed on the Department website at:
https://azdor.gov/sites/default/files/2023-03/PROPERTY_AgeCalculation.pdf.

Introduction

Improvements on a property, including manufactured housing,[1] have two separate and distinct ages: actual age and effective age. A third measure of age, the weighted age, is applicable when an improvement is expanded by an addition subsequent to the original construction date. The following paragraphs further describe these three improvement ages.

Actual Age

The actual age of an improvement is equal to the number of years that have elapsed since construction of the improvement was completed.[2] Thus, actual age is also referred to as historical age or chronological age.[3]

Effective Age

In contrast to actual age, the effective age of an improvement is an estimated age that is based upon the condition and utility of the improvement.[4] To estimate the effective age of an improvement, the assessor uses standard appraisal methods and techniques and may conduct an inspection. Because effective age is based upon condition and utility, it may be greater than or less than actual age.[5] For additional information regarding effective age, refer to the Appendix below and to the Department publication entitled *Approaches to Value*.

[1] When estimating the effective age of a mobile home, unique considerations and procedures apply. For more information, refer to the Department publication, *Manufactured Housing Manual*, under the heading "Additional Factors Affecting Valuation", and the subheading, "*Modernization*".
[2] International Association of Assessing Officers (IAAO), Glossary for Property Appraisal and Assessment, 2nd ed. (Kansas City: IAAO, 2013), 3 [hereinafter, IAAO Glossary].
[3] Ibid.
[4] See ibid., 58. See also IAAO, *Property Assessment Valuation*, 3d ed. (Kansas City: IAAO, 2010), 270 [hereinafter, Property Assessment Valuation].
[5] See Property Assessment Valuation, *supra* note 4, at 270.

Weighted Age

When an improvement is expanded by an addition subsequent to the original construction date, the age of the entire improvement must be weighted to account for the fact that part of the improvement is new and part of it is not.

The weighted age of an improvement is most commonly calculated according to the square footage that is attributable to both the new portion and the original portion of the improvement.

A less common method utilizes the replacement cost new of each portion, rather than the square footage. If the replacement cost method is used, both the original portion and the added portion of the improvement should be of similar quality.

Factors Affecting Age

There are several factors that may influence the age of an improvement due to their effect on condition and utility. Both the effective age and the weighted age of an improvement may be impacted by the processes of modernization, rehabilitation, and remodeling, including additions. Effective age may also be impacted by the level of maintenance applied to an improvement.

Modernization

Modernization is the process of updating an older improvement to conform with modern styles and standards. This process is frequently used to eliminate any curable functional obsolescence present in an improvement. Examples of modernization include updating a kitchen or bathroom, replacing an evaporative cooler with an air conditioning system, or improving energy efficiency by upgrading doors, windows, and insulation.

Rehabilitation

Rehabilitation is the process of restoring an improvement to a satisfactory condition (i.e., usable, safe, legal, etc.) without changing the original plan, form, or style of the

improvement. The rehabilitation process may be appropriate to address curable physical depreciation (deferred maintenance) or curable functional obsolescence, which can cause an improvement to have an effective age that is greater than its actual age. In such a case, the rehabilitation would generally result in bringing the effective age into agreement with the actual age. Examples of rehabilitation include restoring a damaged property, updating an electrical system to comply with code requirements, or performing lead paint abatement.

Remodeling

Remodeling is a process that changes the plan, form, or style of an improvement and may or may not include the addition of new square footage.[6] Remodeling is sometimes necessary to realize the highest and best use of an improvement. Examples of remodeling include reconfiguring a kitchen, removing a wall to expand a room, or constructing an addition such as a new floor or wing.

Maintenance

The maintenance level applied to an improvement has a primary influence on the effective age of the improvement. Superior maintenance tends to reduce the effective age (causes the improvement to be “newer”), while inadequate or deferred maintenance tends to increase it (causes the improvement to be “older”).

Approaches to Value and Adjusting for Condition

The condition of an improvement directly influences the effective age of the improvement.[7] Therefore, improvement condition should typically be reflected in the three approaches to value, as set forth in the attached Appendix. For additional information regarding the approaches to value, refer to the Department publication, *Approaches to Value*.

[6] See IAAO Glossary, *supra* note 2, at 142.
[7] See ibid., 58.

Calculating Age

Example 1 — Effective Age Calculation Using Construction Components (Modernize, Rehabilitate, Remodel)

The effective age of an improvement that has been modernized, rehabilitated, or remodeled (collectively, modified or modification) may be calculated by determining the percentage of the total improvement that has been modified, multiplying that percentage by the year of the modification and the remaining percentage by the original construction year, and totalling the two products to yield the effective age.

To determine the portion of an improvement that has been modified, a building component system may be used. In such a system, each building component (e.g., foundation, roof, walls) is assigned a percentage of the total building. These percentages may be added together to provide the total percentage of the improvement that has been modified.

The tables below provide component schedules for both commercial and residential improvements, based upon data in published construction cost indexes. The assessor may use these tables or may choose to create their own.

Typical Percentages by Component — Residential		
Component		**Percent of Improvement**
Built-in appliances		3
Built-in cabinets, interior doors, trim, etc.		13
Concrete		8
Excavation, forms, water/sewage hookup		4
Exterior cover		6
Flooring covers		3
Insulation		1
Interior drywall		8
Light fixtures and finish hardware		2
Painting and decorating		4
Plans, permits, and survey		2
Plumbing fixtures		5
Roof		3
Rough framing		21
Rough-in electric and mechanical		11
Rough-in plumbing		4
Windows and exterior doors	+	2
Total		**100**

Typical Percentages by Component — Commercial		
Component		**Percent of Improvement**
Electrical		10.5
Floor		10.6
Foundation		3.4
Heating & Cooling		9.1
Interior		19.2
Other Items		1.5
Plumbing		6.4
Roof		14.7
Structural		3.1
Walls	+	21.5
Total		**100.0**

In this example, a 10,000 square foot commercial building constructed in 2010 was remodeled in 2020, as follows: the interior of the building was gutted and replaced, a new heating and cooling system was installed, and the electrical and plumbing systems were updated. In addition, a new storefront was added to the building, which replaced 25 percent of the total wall area.

Step 1: Use the preceding schedule of commercial building components (or an alternative schedule) to determine the percentage of the building that was remodeled.

Percentage Remodeled	
Component	**Percent of Improvement**
Electrical	10.5
Heating & Cooling	9.1
Interior	19.2
Plumbing	6.4
Walls (21.5% x 25%)	+ 5.4
Total	**50.6**

Step 2: Multiply the percentage of each portion by its respective construction year, and add the two products together to yield the effective age.

Effective Age			
Remodeled portion	.506 x 2020	=	1022.12
Original portion (1 - .506 = .494)	.494 x 2010	=	+ 992.94
Total		**=**	**2015.06**

The effective age of the building is 2015.06, rounded to **2015**.

Example 2 — Weighted Age Calculation Using Square Footage (Addition)

The method set forth in this example may be used to determine the weighted age of an improvement that has been expanded by an addition. This method produces a weighted age based upon the percentage of the total square footage that is attributable to the original improvement and to the new addition.

It is important to note that this method is effective whether or not the addition and the original improvement are of the same quality (same replacement cost). As a result, this method is more commonly used.

In this example, a 2,030 square foot residence constructed in 2010 was expanded by a 500 square foot addition in 2020.

Step 1: Calculate the total square footage of the residence.

Total Square Footage		
Original square footage		2,030
Addition square footage		+ 500
Total	**=**	**2,530**

Step 2: Divide the square footage of each portion by the total square footage to determine the percentage of the building that each portion represents. The percentages are rounded to the fourth decimal place in this example.

Percentages			
Original portion	2,030 ÷ 2,530	=	.8024
Addition portion	500 ÷ 2,530	=	.1976

Step 3: Multiply the percentage of each portion by its corresponding construction year, and add the two products together to yield the weighted age. The products are rounded to the second decimal place in this example.

Weighted Age			
Original portion	.8024 x 2010	=	1,612.82
Addition portion	.1976 x 2020	=	+ 399.15
Total		**=**	**2011.97**

The weighted age of the building is 2011.97, rounded to **2012**.

Example 3 — Weighted Age Calculation Using Replacement Cost (Addition)

The method set forth in this example may be used to determine the weighted age of an improvement that has been expanded by an addition. This method produces a weighted age based upon the percentage of the total replacement cost that is attributable to the original improvement and the new addition.

It is important to note that this method is effective **only** if the addition and the original improvement are of the **same quality** (same replacement cost). As a result, this method is not as commonly used as the square foot method.

In this example, a 2,030 square foot residence constructed in 2010 was expanded by a 500 square foot addition in 2020. Both the original residence and the addition have an estimated replacement cost new of $150.00 per square foot, or $304,500 and $75,000, respectively.

Step 1: Calculate the total replacement cost new of the residence.

Total Replacement Cost New			
Original replacement cost new		$	304,500
Addition replacement cost new		$	+ 75,000
Total	**=**	**$**	**379,500**

Step 2: Divide the replacement cost new of each portion by the total replacement cost new to determine the percentage of the building that each portion represents. The percentages are rounded to the fourth decimal place in this example.

Percentages			
Original portion	$304,500 ÷ $379,500	=	.8024
Addition portion	$75,000 ÷ $379,500	=	.1976

Step 3: Multiply the percentage of each portion by its corresponding year of construction, and add the two products together to yield the weighted age. The products are rounded to the second decimal place in this example.

Weighted Age			
Original portion	.8024 x 2010	=	1,612.82
Addition portion	.1976 x 2020	=	+ 399.15
Total		**=**	**2011.97**

The weighted age of the building is 2011.97, rounded to **2012**.

Note that for the same improvement, the square foot method and the replacement cost method (assuming matching qualities) should yield identical weighted ages and related calculations. In this way, one method may be used as a check on the other.

Example 4 — Effective Age and Weighted Age Calculations Using Construction Components and Square Footage (Modification and Addition)

In some instances, an improvement is both modified and expanded with additional square footage at the same time. If this is the case, the effective age of the original improvement can be calculated using construction components as in Example 1, above. Then, using the calculated effective age in lieu of the original construction year (actual age), the weighted age of the expanded improvement can in turn be calculated using either the square foot method or the replacement cost method.[8]

In this example, the 10,000 square foot commercial building in Example 1 was remodeled as set forth in that exercise, but was also expanded with a 2,000 square foot addition. A review of information from Example 1 follows.

Original construction year: 2010
Remodel / Addition Year: 2020
Effective Age: 2015

For this exercise, assume the original building and the addition are of different quality (different replacement cost), so the weighted age should be calculated using square footage as in Example 2, above, rather than replacement cost, as in Example 3, above.

Step 1: Calculate the total square footage of the entire building.

Total Replacement Cost New		
Original square footage		10,000
Addition square footage		+ 2,000
Total	**=**	**12,000**

[8] Using the original construction year (actual age), rather than the calculated effective age, will skew the weighted age too heavily toward the original construction year.

Step 2: Divide the square footage of each portion by the total square footage to determine the percentage of the building that each portion represents. The percentages are rounded to the fourth decimal place in this example.

Percentages			
Original portion	10,000 ÷ 12,000	=	.8333
Addition portion	2,000 ÷ 12,000	=	.1667

Step 3: Multiply the percentage of each portion by its corresponding year of construction—substituting the effective age (2015) for the original construction year (actual age) (2010)—and add the two products together to yield the weighted age. The products are rounded to the second decimal place in this example.

Weighted Age			
Original portion	.8333 x 2015 ~~2010~~	=	1,679.10
Addition portion	.1667 x 2020	=	+ 336.73
Total		**=**	**2015.83**

The weighted age of the building is 2015.83, rounded to **2016**.

Appendix

Effective Age and Depreciation

For purposes of the application of depreciation to an improvement, effective age has a relationship with the total economic life and the remaining economic life, as set forth by the International Association of Assessing Officers.

> *Economic life* is the total number of years during which the improvements on the site/land contribute to total property value; economic life is equal to effective age plus remaining economic life and is sometimes referred as total economic life.
>
> ….
>
> *Effective age* is the age of property based on the amount of observed deterioration and obsolescence it has sustained. Effective age may be different from chronological age (typical age of structures equivalent to the one in question with respect to condition and utility, as of the appraisal date), or it may be less than, greater than, or equal to actual age depending upon design, quality, workmanship, materials used, maintenance, and so on.
>
> Effective age + remaining economic life = total economic life.
>
> An improvement's effective age reflects the quality of its construction and the degree of maintenance it has received. Any improvement suffers some physical defect eventually, whether from the elements or from the way in which it is used. Those defects have a greater effect on improvements that were poorly constructed. If necessary maintenance and repairs are neglected, the process of deterioration is enhanced, and the physical life of the structure is shortened. On the other hand, well-constructed and well-maintained improvements benefit from a prolonged physical life.
>
> *Remaining economic life* is the estimated number of years remaining during which the improvements continue to contribute to total property value.
>
> Remaining economic life = total economic life – effective age.
>
> ....

The five methods of measuring depreciation consider the above-mentioned age-life relationships either directly or indirectly.[9]

Approaches to Value and Adjusting for Condition

Adjusting for Condition and the Cost Approach

With respect to the cost approach, the condition of an improvement should typically be accounted for by subtracting the estimated cost to cure any deferred maintenance from the replacement or reproduction cost of the improvement as an item of accrued depreciation.

Adjusting for Condition and the Income Approach

The income stream that a property generates is typically subject to the economic forces of supply and demand. A property in superior condition, relative to competing properties, would generally command above-market rents, while a property in inferior condition would typically produce below-market rents. Therefore, the condition of a property is inherently reflected in the amount of rent paid, and no adjustment to the income stream for condition is necessary.

When estimating the market value of a property using the income approach, the net operating income is based upon market rent rather than actual rent. Market rent is the amount of rent that a property should command in the open market. However, a property that is subject to deferred maintenance may not be able to command market rent or may not be able to attract a tenant at any rent level if the deferred maintenance

[9] Property Assessment Valuation, *supra* note 4, at 270-71.

is too severe. Therefore, it is appropriate to subtract the cost to cure the deferred maintenance from the final value indicated by the income approach, as follows:

1. Calculate the net operating income of the property using market rent.
2. Capitalize the income to estimate the market value.
3. Subtract the cost to cure the deferred maintenance.

This procedure provides an **as is** value of the improvement, as indicated by the income approach. Subtracting the cost to cure the deferred maintenance from the estimated market value accounts for the fact that market rent is generally unattainable until the condition of the subject property is improved to correspond with that of competing properties.

Adjusting for Condition and the Sales Comparison Approach

When utilizing the sales comparison approach, inadequate or superior maintenance should typically be reflected in the condition adjustment to comparable sales. If a comparable property is inferior in condition to the subject property, then a positive adjustment to the value of the comparable property must be made. Alternatively, if the condition of a comparable property is superior to that of the subject, a negative adjustment to the value of the comparable property is required. If deferred maintenance is the only factor affecting the condition of the subject property, the cost to cure the deferred maintenance may represent the appropriate condition adjustment.