

Land Valuation Workshop

Land Modeling Basics

Property Tax Division Continuing Education

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Our Presentation Team

- Doug Braly – Yavapai County, CAMA Coordinator
- Jennifer McGovern – Yavapai County, CAMA Analyst
- Brit Ferguson – Navajo County, CAMA Manager
- Mike Lopata – DOR, CAMA Specialist

Who are you??????

By a show of hands.....

Customer Service Staff?

Cartography?

Residential Appraisers?

Personal Property?

Land Appraisers?

Bosses/Supervisors?

Commercial Appraisers?

Jack of all trades?

Not really sure what I am.....? 😊

What we are going to talk about today???

- Very basic concepts of mass land appraisal
- We are going to have fun.....I think.
- We are going to talk about land valuation challenges
- We are going to do some “in class homework”
😊
- Someone will win a prize!



End of class raffle and prize!!!

Name: _____

County: _____

What is your job title? _____

Comment? _____

In my county our Land Dept. could do a better job
by....??? _____

Must be submitted for chance to win!!

Let's do a little warmup



Mass Appraisal of Land.....

.....is difficult and challenging



Join our fraternity and take on
the challenge

We are here today to recruit
land appraisers!!!!!!!

Nothing GREAT
was EVER achieved
without enthusiasm.

-EMERSON

Land more challenging than Improved Property?

Say you are an appraiser in a Cost Model County, and you are responsible for both Improved Property Valuation and Land Valuation.

Cost Model for Improved Property

Total Value = Improvement Value + Land Value

- Improvement Value = Depreciated Cost
- Depreciated Cost Source: CAMA System Cost Provider
- Land Value Source: Your Land Valuation Market Model

Land Valuation: What is the basic objective?

In Arizona assessment, we need to set a land value for every property in the jurisdiction every year. At the beginning of the valuation cycle for each year, the values are unknown. Our job is to find a solution for these unknown values. Notwithstanding a few exceptions, we are required to set these values based on Market Value.

The basic objective is to estimate Land Market Value for virtually all properties.

Of course, it would be unreasonable to expect us to perform an individual single-property appraisal on every property in a jurisdiction during a valuation cycle. That's why we utilize computers along with Mass Appraisal methodology and techniques.

A common Mass Appraisal technique is known as Market Modeling through sales analysis.

The Market Model is the “CAMA-sized” version of the Sales Comparison Approach.

Mass Appraisal

- The process of valuing a group of properties as of a given date, using standard methods, and allowing for statistical testing.

Source: Glossary

Property Appraisal and Assessment
Administration - IAAO

IAAO Definition

“A Model is a representation of how something works”

Source: Chapter 14, page 315

Property Appraisal and Assessment
Administration

Market Model for Land

An inherent assumption or hypothesis in the Market Model is that Market Value can be explained by a mathematical equation.

Hypothesis:

Land Market Value = A dollar amount combination of property characteristics

Which characteristics? We have many to choose from. Let's make a quick list, acknowledging that it is not all-inclusive.

- Location (Neighborhood / Subarea)
- Zoning / Type of Use (Residential, Commercial, Industrial)
- Size / Land Area (Acres or Square Feet)
- Shape / Configuration
- Utilities (Water, Sewer, Gas, Electric)
- Lot Type (Corner, Interior, Shopping Center Pad Site)
- Topography
- Adjacent Influence (Lake, Golf Course, Power Lines)
- Traffic Count

What exactly is a Model.....again?

Simply put, a model is a representation of how something works, or how something behaves.

In the case of a Land Market Model, a mathematical equation is designed in an attempt to estimate Market Value (dependent variable), based on Property Characteristics (independent variables). In this scenario, our hypothesis is that the value for a particular property depends on its characteristics.

The model is an attempt to explain buyer and seller behavior in the real estate market for land.

Multiplicative Model Equation

- Multiplicative means all the terms are multiplied.

Market Land Value = Location x Size x Shape x Topography x Adjacent Influence ...

Land Valuation Methods

Sales Comparison Approach

Sales Comparison Analysis. The sales comparison approach, based upon the economic principle of substitution, uses direct evidence of market's opinion of value for the subject property. The approach involves analysis of sales of comparable properties. In addition to actual sales, other sources for sales information for analysis include listings, offers, opinions of real estate agents, and opinions of appraisers. This approach requires obtaining a concise description of the sale properties and a precise expression of the sales price and related information¹. The description of the sold properties goes beyond just the physical dimensions of the property to include the property rights and restriction to those rights that go with the properties.



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Property Tax Division

LAND MANUAL

CHAPTER 3

LAND VALUATION METHODS

Revised: January 1, 2001

Page: 3.2

Land Valuation Methods - continued

- a) **Front foot.** Use front foot when front footage significantly contributes to value. Buyers usually purchase prime waterfront lots and prime commercial lots by front foot.
- b) **Square foot.** Use square foot as a unit of comparison when the analysis indicates that sites typically sell for a given price per square foot of land area.
- c) **Acre.** In general, market analysis will show that appraisers should use price per acre as the unit of comparison for large industrial sites rural and agricultural properties. Convert land area to acres by dividing square footage of land by 43,560 square feet per acre.
- d) **Site.** Use site value as a unit of comparison when the market does not indicate a difference in value due to land size. Typically, appraisers use site value as a unit of comparison for valuing residential subdivisions, planned unit developments and industrial parks.



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LAND MANUAL

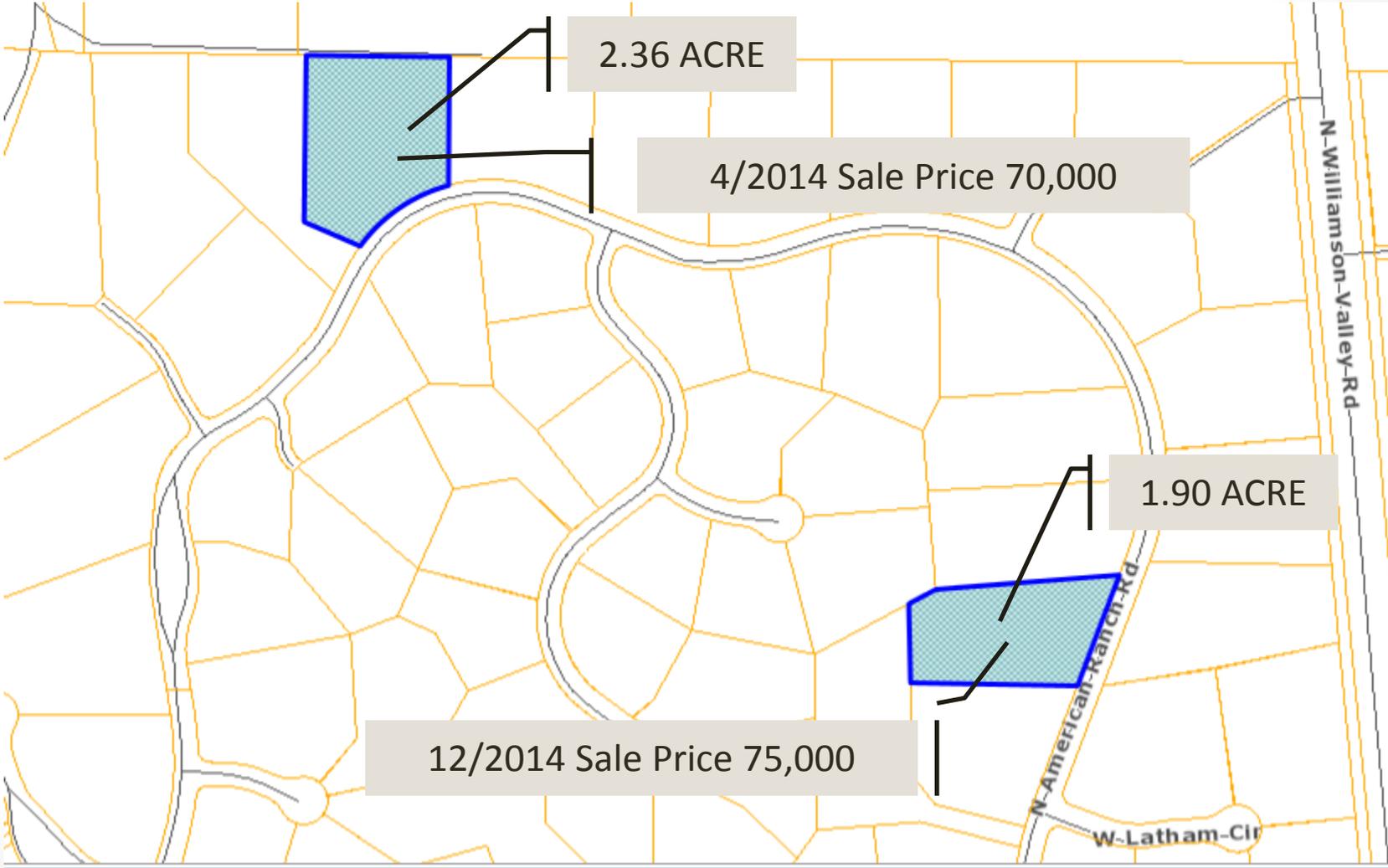
CHAPTER 3

LAND VALUATION METHODS

Revised: January 1, 2001

Page: 3.4

Site. Use site value as a unit of comparison when the market **does not** indicate a difference in value due to land size. Typically, appraisers use site value as a unit of comparison for valuing residential subdivisions



Base Lot Method

2. **Base Lot Method.** This method uses the sales comparison approach to estimate the value of the base lot. The appraiser selects the most typical lot in the subarea as the base lot.
 - a) **Standard of comparison.** The base lot provides a standard of comparison to value the remainder of the parcels in the subarea by making adjustments for differences in property characteristics between the base lot and the subject parcel. The base lot method calculates adjustment amounts caused by differences in property characteristics between the base lot and other comparable sales. The application of these adjustment amounts to the base lot value for differences in property characteristics of individual subject parcels gives an estimate of value for all the parcels in the subarea.



ARIZONA DEPARTMENT OF REVENUE
Property Tax Division

LAND MANUAL

CHAPTER 3
LAND VALUATION METHODS

Revised: January 1, 2001

Page: 3.5

Base Lot Method: Sample Calculation

Base Value X Location X Physical Attributes = Land Value

Base Value X (Attribute 1 X Attribute 2) = Land Value

10,000 X (1.12 X 1.45) = 16,240

Or

10,000 X (1.624) = 16,240

Types of Land Attributes

Location

?

Adjacent Golf

Neighborhood

Adjacent River

Adjacent Freeway

Physical

?

Topography

Shape / Configuration

Floodway

Ground Arsenic

Happy Camper Subdivision



Time to create a land model for Happy Camper Subdivision

Lot#	VL Sale Price	Location	Lot#	VL Sale Price	Location
66	38,700		58	43,650	
7	65,800		12	63,800	
22	42,100		9	62,900	
60	39,100		53	41,800	
62	41,500		24	40,050	
6	39,050		68	36,800	

Base Site _____ X _____ = \$ _____

Attribute _____ Base Value _____ Adjustment _____ Site Value _____
 Base Site & _____ = _____ X _____ = \$ _____

Base Site & _____ = _____ X _____ = \$ _____

Base Site & _____ = _____ X _____ = \$ _____

Base Site & _____ & _____ = _____ = _____ X _____ = \$ _____

Happy Camper Subdivision Calculation Worksheet

NOTE: For extra credit fill in all designated site values on each lot of the subdivision lots. Then "theme" your site values by color coding.

Standard Lot Value

Lot # Sale Price

Median Sale Price _____

Attribute #1

Name: _____

Lot # Sale Price

Median Sale Price _____

Location Adjustment _____

Attribute #2

Name: _____

Lot # Sale Price

Median Sale Price _____

Location Adjustment _____

Attribute #3

Name: _____

Lot # Sale Price

Median Sale Price _____

Location Adjustment _____

Valuing Land By Size

Mike Lopata - DOR

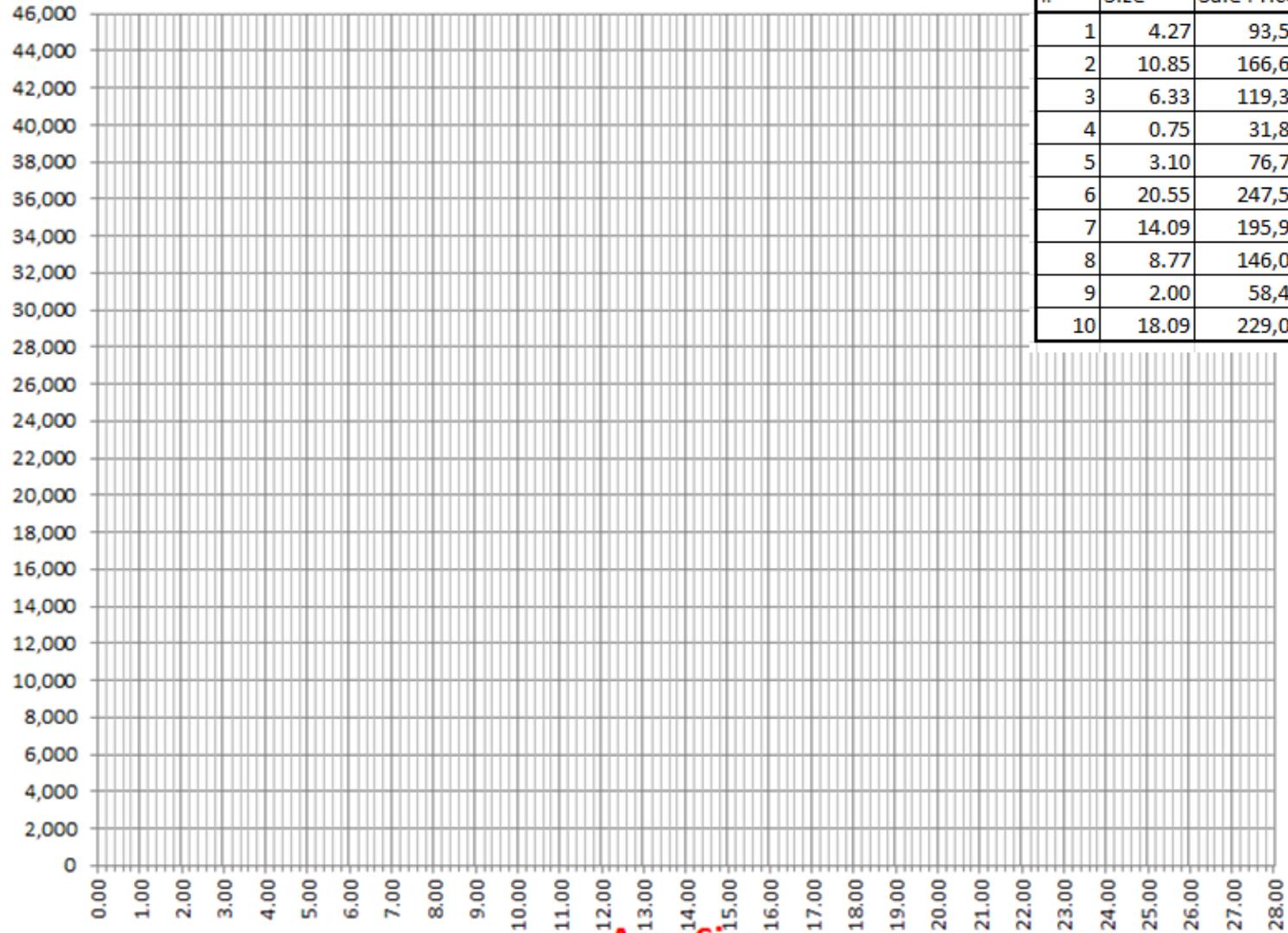
Curve Fitting

Another Gadget in the
Land Appraiser's Toolbox

Unit Price By Size

Sale #	Acre Size	Sale Price	Sale Price Per Acre
1	4.27	93,500	21,897
2	10.85	166,650	15,359
3	6.33	119,395	18,862
4	0.75	31,800	42,400
5	3.10	76,700	24,742
6	20.55	247,500	12,044
7	14.09	195,900	13,903
8	8.77	146,000	16,648
9	2.00	58,400	29,200
10	18.09	229,000	12,659

Price Per Acre



Price Per Acre

Acre Size

Software Functionality: Multiplicative Model

What the Software does do: **Calculations**

- Versatility – Different types of Multiplicative Models
 - a. Acre Model
 - b. Square Foot Model
 - c. Front Foot Model
 - d. Others?

Acre Model (general structure)

Intercept Constant \times (Acre Size $^{\wedge}$ Exponent 1) \times (Front Foot Transformation $^{\wedge}$ Exponent 2) \times Land Attributes

What the Software does not do: **Analysis**

This model requires the use of a **statistical tool like Excel or SPSS** to determine the Intercept and the Exponents.

Curve Fitting Demonstration

Intercept Constant \times (Acre Size $^{\wedge}$ Exponent 1)

Exponents Refresher

$$2^2 = 2 \times 2 = 4$$

$$2^3 = 2 \times 2 \times 2 = 8$$

$$2^1 = 2$$

$$2^0 = 1$$

$$5^0 = 1$$

$$4^1 = 4.00$$

$$4^{0.8} = 3.03$$

$$4^{0.5} = 2.00$$

$$4^{0.2} = 1.32$$

$$4^0 = 1.00$$

$$4^{-0.2} = 0.76$$

$$4^{-0.8} = 0.33$$

$$4^{-1} = 0.25$$

$$4^{-2} = 0.06$$

Thank You!

Questions and Discussion

Who is the prize winner????