State Tax Commission

LAND VALUE DETERMINATIONS & TAX MAPS

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1. OVERVIEW

An assessor is responsible for estimating a land value for every taxable parcel of property which is valued using the cost approach. Similarly, County equalization departments must also establish land values to appraise parcels included in equalization appraisal studies. In establishing land values, you must consider the general forces (economic, social, environmental, and governmental – zoning and deed restrictions) that affect the parcels' value as well as the parcels physical characteristics. These characteristics include location, size, view, frontage on a lake or river, topography, shape, existing vegetation, soil (whether the soil perks, etc.), available utilities, and unusual site preparation costs.

Several methods are available for the land valuation process, including the sales comparison, allocation, extraction, and subdivision development methods, as well as several income capitalization techniques. Land values should generally be applied as calculated and an assessor or equalization director should be prepared to explain any departures from the calculated land values. It is very important to keep land values and supporting documentation related to the development of land values up to date annually.

2. LAND VALUE DEVELOPMENT METHODS

Sales Comparison Method

Using the sales comparison method, information regarding sales of similar vacant land is collected, verified, analyzed, and adjusted to give an indication of value of the property being appraised. The first step in this process is the collection of vacant land sales data. Verification of sales information is essential before recording the information on maps or in a spreadsheet format for analysis as part of the mass appraisal process (or in a standard adjustment grid in single-property applications).

In analyzing data, it is important for an assessing officer to compare the characteristics of sold parcels such as location, highest and best use, size, etc. In mass appraisal situations, this allows the vacant land sales to be grouped based on similar characteristics and the assessing officer may then assign land values derived from the grouping to subject properties sharing similar characteristics with the group.

An important part of the analysis is the use of an appropriate *unit of comparison*. The square foot is the most widely used unit of comparison for land valuation. Because it is an area measurement, it considers all the land in a parcel and can be used to value any and all types of land. The square foot, as a unit of comparison, is especially adapted for valuing parcels with irregular shapes. The square foot is also most commonly used for commercial and industrial parcels.

For residential properties, value per front foot, value per square foot, or value per acre may the best unit of comparison. When using front foot values, it is necessary to consider a depth factor (the use of depth factors is covered extensively later in this program). "Frontage" is the lineal distance that a lot (usually referring to an urban or suburban lot) borders on a street or water, and is typically expressed in feet. Site or lot values are another option for residential properties, especially in platted subdivisions. Agricultural land is typically valued on a per acre basis. The acre is used as a unit of comparison when valuing large land areas (e.g., farms, pastures, timber lands, recreational lands, etc.).

Selecting the proper unit of comparison is important in gaining an understanding of how the market is behaving. Conversely, selection of an inappropriate unit of comparison can lead to faulty results. For example, it would generally not be a good idea to use front foot values to appraise land which has a highest and best use of agricultural.

In the mass appraisal process, regardless of the unit of comparison selected, you must also give consideration to adjustments for positive or negative influences in setting the land value for a parcel. Influences such as corner lots in residential settings, high traffic volumes (generally a positive influence for commercial parcels but generally a negative influence for residential parcels), unusual shape, unusual topography, nearby nuisances, etc. should be given consideration for possible adjustment. To the extent possible, adjustments should be derived from the market. For example, the market would likely recognize that a parcel in a residential area that has an unusual formation of bedrock just beneath the surface of the land (which would prevent a normal basement from being constructed) is worth less than normal for the neighborhood. In such a case, an assessing officer should determine an appropriate negative adjustment from available sales information and apply that adjustment to the neighborhood's front foot rate (or square foot rate or site value) for the affected parcel.

Regardless of the unit of comparison that is selected for use, it is important to note that **land lying under a public road right-of-way is exempt and should not be considered in a parcel's area.** For instance, in determining a parcel's value per acre the area under a public road right-of-way is not to be included in the parcel's area.

A table is provided below containing vacant land sales information compiled in a mass appraisal situation. The information shown has been collected, verified, analyzed, and sorted by surface area (size). In this case, the selected unit of comparison is value per square foot. This information has been developed to the point where a conclusion of value could easily be drawn and then applied to a group of subject properties with a highest and best use of office, a land area of roughly 90,000 to 110,000 square feet, and a good location in the same assessment unit and local school district in which the vacant land sales occurred. Where possible, vacant land sales information should be developed and

maintained by category of property to be appraised. (In practice the table would likely contain additional information such as parcel number, grantor, grantee, liber and page, adjusted sale price, etc.).

SALE DATE	SALE PRICE	AREA (SQUARE FEET)	SALE PRICE PER SQUARE FOOT	COMMENTS
1/27/2012	$363,700	88,712	$4.10	Good Location/Future Office Site
10/3/2011	$373,600	90,019	$4.15	Good Location/Future Office Site
2/10/2012	$370,000	91,814	$4.03	Good Location/Future Office Site
8/15/2011	$405,000	100,988	$4.01	Good Location/Future Office Site
12/8/2011	$412,900	101,954	$4.05	Good Location/Future Office Site
11/22/2011	$417,700	108,490	$3.85	Good Location/Future Office Site
10/14/2011	$424,100	111,598	$3.80	Good Location/Future Office Site
5/14/2011	$428,400	113,944	$3.76	Good Location/Future Office Site

The information provided above is uniform and logical in nature. In a real world setting, such a high degree of uniformity and logic is rare. An assessing officer establishing land values often must deal with difficult or confusing sales information. It can be common for sales information to contain outliers, which are values that lie outside the range of values formed by the majority of other sales. Another common problem is for the sales information to appear not to lead to a logical conclusion. Or it may be that there is a lack of sales information. Assessing officers must deal with all of these difficult situations when valuing land.

The chart from above has been reproduced with the addition of two outlier sales shown in strikethrough.

SALE DATE	SALE PRICE	AREA (SQUARE FEET)	SALE PRICE PER SQUARE FOOT	COMMENTS
1/27/2012	$363,700	88,712	$4.10	Good Location/Future Office Site
10/3/2011	$373,600	90,019	$4.15	Good Location/Future Office Site
~~10/25/2011~~	~~$495,700~~	~~90, 129~~	~~$5.50~~	~~Good Location/Future Office Site~~
2/10/2012	$370,000	91,814	$4.03	Good Location/Future Office Site
8/15/2011	$405,000	100,988	$4.01	Good Location/Future Office Site
12/8/2011	$412,900	101,954	$4.05	Good Location/Future Office Site
~~1/30/2012~~	~~$303,850~~	~~103,000~~	~~$2.95~~	~~Good Location/Future Office Site~~
11/22/2011	$417,700	108,490	$3.85	Good Location/Future Office Site
10/14/2011	$424,100	111,598	$3.80	Good Location/Future Office Site
5/14/2011	$428,400	113,944	$3.76	Good Location/Future Office Site

These two sales are considered outliers because their sale prices per square foot lie well outside the range of values formed by the other sales information. Under these circumstances, use of the outlier sales information may lead to faulty results. Often there will be a reason for the divergent sale price. If additional investigation showed that the buyer and seller involved in the sale for $2.95 per square foot were business partners and the reduced price was due to their business association, it would be appropriate to remove that sale from the analysis. Generally speaking, unexplained outlier sales should be given little weight in determining land values. They can remain in the chart but should be noted as inactive and not used in the analysis. If additional review does not reveal a valid reason to remove that sale from the analysis, the sale may remain in the chart, however it should not be given much weight in reaching a land value conclusion.

The following chart contains residential vacant land sales information. All of the sales information comes from the same residential subdivision and the same time period (and assume for this example that the lots all have the same depth). Looking at this information it would be difficult to determine the proper land value to use in this subdivision. As an example, the four indicated values for lots having

85 feet of frontage are: $547, $550, $625, and $647. Additional analysis is needed to form a conclusion regarding the appropriate front foot values to use.

SALE DATE	SALE PRICE	FRONT FEET	SALE PRICE PER FRONT FOOT	COMMENTS
2/27/2012	$45,000	75	$600	Residential Site
8/13/2011	$55,000	75	$733	Residential Site
11/25/2011	$56,000	75	$747	Residential Site
1/10/2012	$46,400	80	$580	Residential Site
6/6/2011	$54,000	80	$675	Residential Site
10/8/2011	$47,000	80	$588	Residential Site
2/30/2012	$46,500	85	$547	Residential Site
10/29/2011	$46,750	85	$550	Residential Site
7/14/2011	$53,125	85	$625	Residential Site
5/15/2011	$55,000	85	$647	Residential Site

When the assessor does more research, they find that a local school district boundary cuts through this subdivision. With this additional piece of the puzzle in place, a definite pattern emerges from the data, as shown below. School district B is clearly more desirable than school district A and the assessing officer can use the information below to establish reliable front foot rates for lots in this subdivision. The important point to remember from this example is that, with additional analysis, confusing data can be turned into meaningful information.

SALE DATE	SALE PRICE	FRONT FEET	SALE PRICE PER FRONT FOOT	COMMENTS
2/27/2012	$45,000	75	$600	Residential Site/School District A
8/13/2011	**$55,000**	**75**	**$733**	**Residential Site/School District B**
11/25/2011	**$56,000**	**75**	**$747**	**Residential Site/School District B**
1/10/2012	$46,400	80	$580	Residential Site/School District A
6/6/2011	**$54,000**	**80**	**$675**	**Residential Site/School District B**
10/8/2011	$47,000	80	$588	Residential Site/School District A
2/30/2012	$46,500	85	$547	Residential Site/School District A
10/29/2011	$46,750	85	$550	Residential Site/School District A
7/14/2011	**$53,125**	**85**	**$625**	**Residential Site/School District B**
5/15/2011	**$55,000**	**85**	**$647**	**Residential Site/School District B**

In many situations, an assessing officer setting land values will be faced with a lack of sales information. For example, an assessor trying to establish land values for tillable land in his jurisdiction may not have any sales within the entire Township during the two-year sales study period. Likewise, a county equalization department trying to create industrial land values may not have any industrial vacant sales in the county over the past several years. In difficult situations like these, land values must still be determined and used.

When there is a lack of sales information, the assessor should use sales outside the normal time frame of the sales study period, or use sales from outside the area for which land values are being determined. If sales from outside the normal time frame of the sales study period are used, adjustment for market conditions (i.e., a time adjustment) should be made to bring the sales to the midpoint of the sales study period. If sales from outside the area for which land values are being determined are used, adjustment for location should be made.

The calculations below demonstrate how to determine an adjustment from market data for changing market conditions or time:

Original sale price (two years ago):	$175,500 (A)
Sale price of same property (present time):	$182,000 (B)
Change over two-year period (B ÷ A - 1 = C):	.0370, 3.70% (C)
Percentage change per year (3.70% ÷ 2 years = D):	1.85% (D)

The analysis above is called a “paired sales analysis”. A paired sales analysis is a technique to identify and measure adjustments to sales prices or rents of comparable properties. In order to apply this technique you need to use properties that are identical or as nearly identical as possible. A paired sales analysis will help you identify and isolate the effect of a single variable on the value of a property, for example time.

The example above indicates a 1.85% increase in market value per year for the subject property (this assumes no physical changes to the property, etc. over that time). Using paired-sales analyses like this, an assessor can determine an appropriate time adjustment and then apply that time adjustment to older sales to supplement existing sales information and determine land values for an area. It should be kept in mind that a single paired sales analysis is generally not considered sufficient to justify the adjustment of older sales information to the mid point of the current sales study period.

The following demonstrates how to make an adjustment for location from market evidence. Sale 1, for $27,000, is a vacant lot located in subdivision A which has no other vacant land sales. The assessor is trying to establish land values for subdivision A. Sale 2, for $25,000, is a vacant lot located in subdivision B which is similar to subdivision A. These two vacant lots are similar in all respects

except for location. The calculations below demonstrate how to determine an adjustment from market data for location:

Sale 1:	$27,000 (A)
Sale 2:	$25,000 (B)
Difference in value due to location (A ÷ B – 1 = C):	.080 or 8.0% (C)

This paired-sales analysis indicates that subdivision A is 8.0 % superior in location to subdivision B (i.e., this indicates that the assessor should use a multiplier of 1.080 to adjust vacant land sales from subdivision B to arrive at a land value conclusion for subdivision A). Using paired-sales analyses like this, an assessing officer can determine an appropriate location adjustment and then apply that adjustment to sales outside subdivision A to supplement existing sales information and determine land values for subdivision A. Assessors are cautioned that a single paired-sales analysis is generally not sufficient to justify the adjustment of sales outside the area in question for location and that a long time period on any type of paired sales analysis is not useful; over a long period trends will tend to be fairly normal looking.

As a last resort, an assessor could consider reviewing “asking prices” to help establish land values. If an assessor is going to use this method, they need to understand that actual sale prices are typically a percentage of “asking price”. For example, an asking price of $119,900 might result in an actual sale price of $110,000. It is important for an assessor to know their market extremely well when considering “asking price”. Discussions with knowledgeable sources, realtors, and fee appraisers may be used to support land value conclusions drawn by an assessor.

Practical Exercise for Time Adjustments:

The first step in determining a time adjustment is to locate parcels that are twice sold i.e.: those sold twice in a given time period. It is important to verify that there were no physical changes to the parcel between the sales. Divide the most recent sale price by the original sale price to determine the overall percentage of change. Finally, divide the overall percentage of change by the number of time periods between the two sales to determine the percentage change per month or year.

Below are is an example of twice-sold parcels. Fill in the blanks.

Original sale price (Sept 1, 2004):	$225,000 (A)
Sale price of same property (April 1, 2009):	$305,000 (B)
Percentage change in value between sales (B ÷ A – 1 = C):	(C)
Percentage change in value per month (55 months):	(D)

Original sale price (December 10, 2006):	$325,000 (A)
Sale price of same property (March 11, 2008):	$355,000 (B)

Percentage change in value between sales (B ÷ A – 1 = C): (C)
Percentage change in value per month: (D)

The paired-sales analyses above are of commercial parcels in a given assessing unit. Would it be appropriate to use a time adjustment determined from the above analyses for industrial parcels within that same assessment unit? Why or why not?

The paired-sales analyses above are from the time period September 2004 to April 2009. Would it be appropriate to apply a time adjustment determined from the analyses above to a sale that occurred in March of 2009 to bring that sale forward to April of 2012? Why or why not?

Time Adjustment Answers

Below are two twice-sold parcels which have been discovered through research. Fill in the blanks.

Original sale price (September 1, 2004): $225,000 (A)
Sale price of same property (April 1, 2009): $305,000 (B)
Percentage change in value between sales (B ÷ A = C): 1.356, 35.6%(C)
Percentage change in value per month: 0.65%(D)

Original sale price (December 10, 2006): $325,000 (A)
Sale price of same property (March 11, 2008): $355,000 (B)
Percentage change in value between sales (B ÷ A = C): 1.092, 9.2%(C)
Percentage change in value per month: 0.61%(D)

The paired-sales analyses above are of commercial parcels in a given assessing unit. Would it be appropriate to use a time adjustment determined from the above analyses for industrial parcels within that same assessment unit? Why or why not?

No. Market conditions typically affect industrial properties differently than commercial properties. It would not be appropriate to use a time adjustment determined above from commercial parcels for industrial parcels within that same assessment unit.

The paired-sales analyses above are from the time period September 2004 to April 2009. Would it be appropriate to apply a time adjustment determined from the analyses above to a sale that occurred in March of 2009 to bring that sale forward to April of 2012? Why or why not?

No. Market conditions between April of 2009 and April of 2012 may well have been different than the market conditions covered by the paired-sales analyses (the last sale in the analyses occurred in April of 2009). It would not be appropriate to apply a time adjustment determined above to a sale that occurred in March of 2009 to bring that sale forward to April of 2012 without additional support of some kind from the market or from market participants.

Example Land Value Analysis

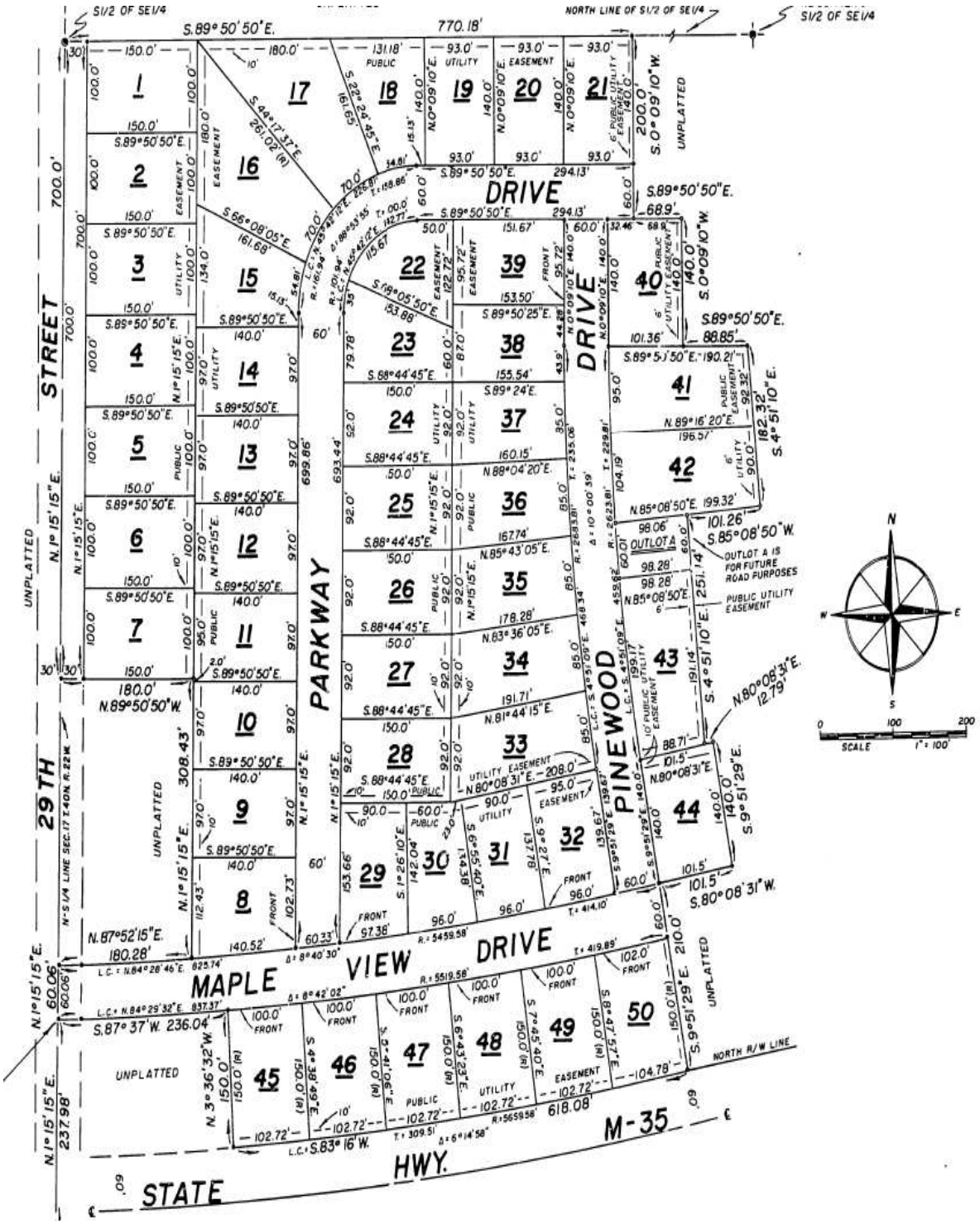
A land value analysis grid and a plat map follow as part of an example land value analysis using the sales comparison approach. In this analysis, several of the lots in the plat have sold and an appropriate analysis (the grid) and resulting conclusions are provided to show how to conduct a vacant land value analysis for a neighborhood.

EXAMPLE LAND VALUE ANALYSIS GRID								
Lot	**Sale Date**	**Sale Price**	**Front Feet**	**SP/FF**	**Square Feet**	**SP/SF**	**Effective Front Feet**	**SP/EFF**
1	**11-11**	**$10,000**	**100**	**$100**	**15,000**	**$0.67**	**100**	**$100**
6	**2-12**	**$9,975**	**100**	**$100**	**15,000**	**$0.67**	**100**	**$100**
11	5-11	$11,000	97	$113	13,580	$0.81	97	$113
12	8-11	$10,900	97	$112	13,580	$0.80	97	$112
24	9-11	$10,300	92	$112	13,800	$0.75	92	$112
31	7-11	$10,500	96	$112	12,468	$0.84	94	$112
37	8-11	$10,750	85	$124	13,983	$0.77	87	$119
41	1-12	$12,600	95	$134	17,815	$0.71	94	$134
45	**4-11**	**$10,000**	**100**	**$99**	**15,204**	**$0.66**	**101**	**$99**
46	**5-11**	**$10,250**	**100**	**$101**	**15,204**	**$0.67**	**101**	**$101**

If the front of a lot is a different size than the rear, the formula for determining the frontage is as follows: ((2 X front feet) + rear feet) ÷ 3. In this case, the front of the lot is 96 feet and the rear of the lot is 90 feet. The calculation for the frontage to use in valuing the parcel is as follows: ((2 X 96 feet) + 90 feet) ÷ 3 = 94 feet. The frontages of other lots (37, 41, 45, and 46) in this example are determined in this manner as well.

Lots 1, 6, 45, and 46 are on the exterior of the plat and border on major roads (with higher speeds, greater traffic counts, etc.). The lower values of these lots reflect this negative influence. Lots 1, 6, 45, and 46 all have lower values per front foot and per effective front foot. The use of a site or lot value would work well for these as well. The remaining lots are all interior lots within the subdivision. The use of lot or site values for these lots would be less than ideal. Also, the sale price per front foot for these lots is less consistent. Using the sale price per effective front foot, however, yields consistent results for all the lots in the subdivision, with the exception of lot 24 which appears to be an outlier and should carry little weight in the analysis. Based on this analysis, a value of $100 per effective front foot appears appropriate for lots bordering on major roads and a value of $118 per effective front foot appears to be indicated for interior lots

within the subdivision. Alternatively, a rate of $118 per effective front foot could be used for all the lots with a negative location adjustment (of about $18 per effective front foot) used to value lots on major roads).



ALLOCATION METHOD

When limited sales data are available in a given neighborhood or area, it is sometimes necessary to use alternative methods of land valuation. In the allocation method, the assessor first determines a typical ratio of *land value to total property value* (or building value) for the specific type of property being appraised and then infers land value for the subject property or properties by applying that ratio. This method can be used when sales of vacant land are scarce (or non-existent) in a given area, but where there have recently been sales of improved properties and is especially applicable in residential appraisal situations.

This method is generally considered less reliable than the sales comparison method. However in completely developed neighborhoods it can provide a fairly good indication of value if a good analysis is conducted and outliers are reviewed and investigated.

If an assessor needs to determine land values for residential lots in a new subdivision A, which has not had any vacant land sales activity, and the assessor has a more established subdivision B, which is somewhat similar to subdivision A and has sufficient sales of both vacant and improved land; using the allocation method, the assessor would first analyze vacant land sales in subdivision B and determine their relationship to the improved sales in subdivision B.

Based on that analysis, if the assessor could conclude that land values in subdivision B are typically around 25% of the sale price of improved properties, then a ratio of 25% could be used to assign land values to lots in subdivision A based on improved property sales in subdivision A. As an example, if an improved sale occurred in subdivision A with a sale price of $350,000, the assessor would multiply that sale price by 25% ($350,000 x 0.25), giving an indicated land value of $87,500.

Allocation Method Example: In this example, there is sufficient sales information available for improved parcels within neighborhood "A" but few sales of vacant land. Both vacant and improved sales in a similar neighborhood B are available:

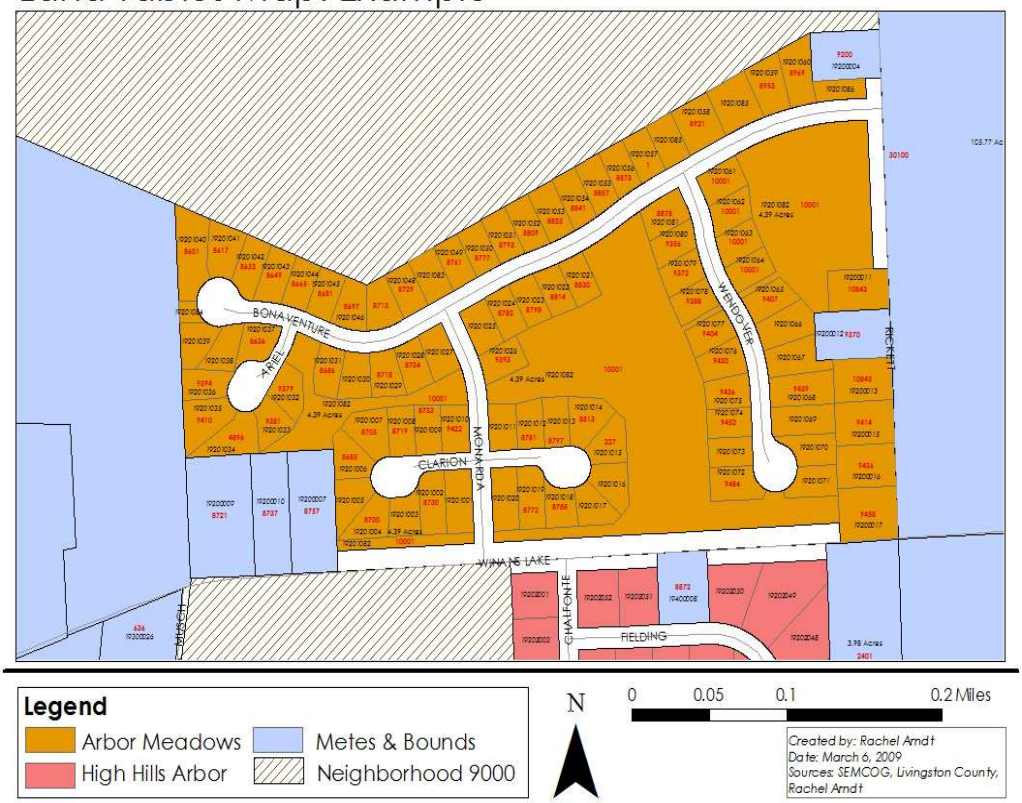
Vacant / Improved	Address	Sale Price	Indicated LV	Ratio LV to Prop	Ratio LV to Bldg
Vacant	8730 Clarion	$77,000			
Vacant	8700 Clarion	$73,000			
	Indicated LV->	**$75,000**			
Improved	8719 Clarion	$376,000	20%	**1 to 5**	**1 to 4**
Vacant	8829 Bonaventure	$58,000			
Vacant	8718 Bonaventure	$63,000			
	Indicated LV->	**$60,000**			
Improved	8803 Bonaventure	$310,000	19%	**1 to 5**	**1 to 4**
Vacant	8601 Bonaventure	$68,000			
Vacant	8665 Bonaventure	$72,500			
	Indicated LV->	**$70,000**			
Improved	8713 Bonaventure	$340,000	21%	**1 to 5**	**1 to 4**
Conclusion: Land Value to Prop. or Bldg. Value Ratio				**1 to 5**	**1 to 4**

NEIGHBORHOOD "A" VALUES – Based on a Land to Property Value Ratio of 1 to 5 (20% of Property Price or Value)

Parcel Number	Address	Sale Price or Property Value	**Indicated Land Value**	Building Value
4716-19-201-056	8873 Vista	$412,000	**$82,400**	$329,600
4716-19-201-060	8969 Vista	$390,000	**$78,000**	$312,000
4716-19-201-068	9439 Wendover	$350,000	**$70,000**	$280,000
4716-19-201-074	9452 Wendover	$450,000	**$90,000**	$360,000
4716-19-201-075	9436 Wendover	$335,000	**$67,000**	$268,000
4716-19-201-077	9404 Wendover	$400,000	**$80,000**	$320,000
4716-19-201-081	8878 Vista	$362,000	**$72,400**	$289,600

The chart above shows an indicated site value based on a land to property value ratio of 1 to 5 and or a land to building value ratio of 1 to 4. In analyzing a sale using this data, you would use the land to property ratio of 1 to 5 (20%) against the sale price to estimate a land value. In conducting a cost appraisal, you would determine the building value (RCNLD), and then use the land to building ratio 1 to 4 (25%) to estimate the land value.

Land Tables Map: Example



EXTRACTION METHOD

The extraction method is another alternative method of land valuation which can be used when there is insufficient vacant land sales information. This method is considered one of the least reliable methods due to the difficulty of measuring accrued depreciation. It does however work fairly well on relatively new structures that have recently sold as long as a proper Economic Condition Factor has been calculated.

In this method, an estimate of the depreciated cost of improvements is subtracted from the sale price of an improved property leaving an estimate of the value of the land. For example, an improved property that sold for $375,000 with an estimated depreciated cost of improvements of $262,500 would suggest a land value of $112,500 ($375,000 - $262,500 = $112,500).

SUBDIVISION DEVELOPMENT METHOD

This method is often used to value land in transition between uses, such as from agricultural use to a residential or commercial use. Under this method the assessor would use *highest and best use*. For example: assume the highest and

best use for the parcel is for development into a residential subdivision. The assessor first would estimate the costs associated with developing the parcel into a subdivision and then subtracts those costs from the anticipated sale prices of the developed sites. Because the subdivision development method uses many items that are difficult to accurately measure, use of method should be limited to cases where there are an insufficient number of sales of similar parcels available for development. A primary consideration in using this method is that the land must be ripe for development and either zoning permits this use or there is a reasonable probability of a change in zoning to allow this use.

Subdivision Development Method Example: A 20-acre parcel is zoned for single-family residences which is also the highest and best use of the property. Assuming the parcel can be developed into four lots to the acre, including streets, the first consideration is supply and demand as well as purchasing power. The market indicates a value of $40,000 per lot, or $3,200,000, when the parcel has been completely developed (4 lots per acre X 20 acres = 80 lots; 80 lots X $40,000 per lot = $3,200,000). Research then needs to be done into anticipated site development costs, including overhead, sales expenses, profit, and interest during development.

Example:

- Site development (streets, sewers, water service, site preparation, planning), 25 %
- Overhead and sales expenses (commissions, title work, advertising, general office expenses, accounting and legal expenses), 25 %
- Profit and interest cost during development and holding period, 25 %

Based on this information the remaining 25% of lot sales can be attributed to the contributory value of the raw land. The value of the land under the subdivision development method is then $800,000 ($3,200,000 total indicated value X 0.25 = $800,000 land value).

DEPTH FACTORS

A depth factor is used, usually in urban or suburban settings, to adjust land value for differences in the actual depth of a parcel compared to the standard or typical depth for an area. A lot that is deeper than the standard depth lot will usually have more value and a lot that has less depth than the standard lot will usually have less value. Depth factors allow for a uniform amount per front foot to be used to value parcels of different depths by adjusting for differences in depth by converting actual frontage into equivalent front feet. This equivalent frontage, multiplied by the established front foot value, gives the appraised value of the lot.

Depth factor tables can be used instead of calculating individual depth factors for each parcel being valued. If a depth factor table is used, the resulting values should be checked against market information to ensure that the table is

appropriate for the area being valued. When using a depth factor table (reprinted from the STC manual), it should be kept in mind that a given depth factor table will not work in all valuation situations.

Figure 36

DEPTH FACTOR TABLE

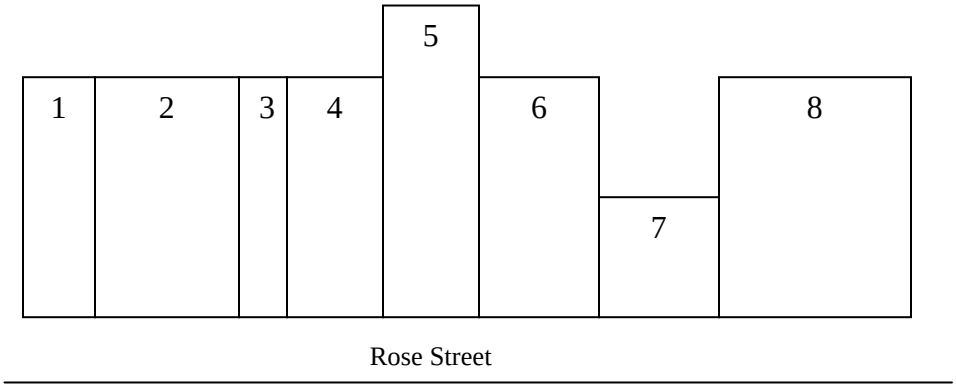
Actual Depth of Lot	Standard Depth of Lot					
	100'	110'	120'	130'	135'	150'
	%	%	%	%	%	%
5'.....	22	21	21	20	19	18
10.....	32	30	29	28	27	26
15.....	39	37	35	34	33	32
20.....	45	43	41	39	39	37
25.....	50	48	46	44	44	41
30.....	55	52	50	48	47	45
35.....	59	56	54	52	51	48
40.....	63	60	58	56	55	52
45.....	67	64	61	59	58	55
50.....	71	67	65	62	61	58
55.....	74	71	68	65	64	61
60.....	78	74	71	68	67	63
65.....	81	77	74	71	69	66
70.....	84	80	76	73	72	68
75.....	87	83	79	76	75	71
80.....	89	85	82	78	77	73
85.....	92	88	84	81	79	75
90.....	95	91	87	83	82	78
95.....	98	93	89	86	84	80
100.....	100	95	91	88	86	82
105.....	103	98	94	90	88	84
110.....	105	100	96	92	90	86
115.....	107	102	98	94	92	88
120.....	110	104	100	96	94	89
125.....	112	107	102	98	96	91
130.....	114	109	104	100	98	93
135.....	116	111	106	102	100	95
140.....	118	113	108	104	102	97
145.....	120	115	110	106	104	98
150.....	123	117	112	108	105	100
155.....	125	119	114	109	107	102
160.....	127	121	116	111	109	103
165.....	129	123	117	113	111	105
170.....	130	124	119	114	112	106
175.....	132	126	121	116	114	108
180.....	134	128	123	118	116	110
185.....	136	130	124	119	117	111
190.....	138	131	126	121	119	113
195.....	140	133	128	123	120	114
200.....	141	135	129	124	122	115

The depth factor table has been modified to eliminate decimals.

7 - 42

TAB 2

Depth factors account for differences between the lots with a standard depth and lots with depths that vary from the standard lot depth. A lot is of standard depth when it has a depth that is common for most other lots in the area. In the drawing below, lots 5 and 7 do not have standard depths while the remaining lots do have a standard depth.



If several of these lots have recently sold, an amount per front foot can be developed:

Lot Number	Sale Price	Front Feet (FF)	Sale Price Per FF
2	$16,500	80	$206
4	$12,000	60	$200
6	$14,500	70	$207
		Indicated Value Per Front Foot:	**$205**

From this information, $205 per front foot is appropriate for lots within this subdivision and all of the lots that have sold are standard depth lots. If the front foot rate of $205 is applied to all of these lots, will it be representative of the market value of each lot? Most people would probably argue that lot 5 should sell for more per front foot because of the additional depth, and lot 7 should sell for less. The use of a depth factor will adjust the front foot rate used for the lots and compensate for the differences in depth.

Using the table above, assume that the standard depth of the lots is 120 feet. Lot 5 is 140 feet deep and lot 7 is 60 feet deep. Both lots have 60 feet of frontage. Using the depth factor table provided, locate the column for standard depth of lot, 120 feet. Lot 5 is 140 feet deep, so go to the left hand column which has a heading of “Actual Depth of Lot”; following across to the right to the column 120 feet, the depth factor is 108. Do the same exercise for the 60 feet actual depth for lot 7, the depth factor is 71. The next step is to apply the depth factor to the actual front feet and then value the lots using the calculated front foot rate:

Lot 5 actual frontage = 60 X 108% = 64.8; 64.8 X $205 = $13,284 or $13,300 rounded
Lot 7 actual frontage = 60 X 71% = 42.6; 42.6 X $205 = $8,733 or $8,700 rounded

Formula used to calculate the depth factors:

Depth factor = $\sqrt{\text{actual lot depth} \div \text{standard lot depth}}$.

Example: 150 feet actual lot depth ÷ 120 feet standard lot depth = 1.25, $\sqrt{1.25} = 1.12$

3. LAND VALUE MAPS

Land value maps are a graphical presentation of land values for an entire assessment unit (i.e., an entire City or Township). A graphical display of land values enables the assessor to explain and defend the results of his or her land value analyses to taxpayers. Constructing land value maps also helps keep the assessor informed of land value changes or patterns in the assessment jurisdiction. Significant information which might not otherwise be noticed often becomes apparent when land value information is presented graphically.

MCL 211.10e requires that assessors maintain land value maps consistent with the standards provided in the State Tax Commission's Assessor's Manual. Land value maps are defined in the Assessor's Manual as "maps on which are recorded the front or square foot value of platted property and the square foot or per acre value of acreage property." A good set of land value maps will contain both, the value conclusions for land used by the assessor to determine assessments, and the vacant land sales information used by the assessor to reach those conclusions. This may take the form of two sets of maps (one with sales information and the other with the assessor's value conclusions). It is a good practice to have individual land value maps, or color coded at a minimum, for different classes of property such as agricultural, residential, commercial, etc.

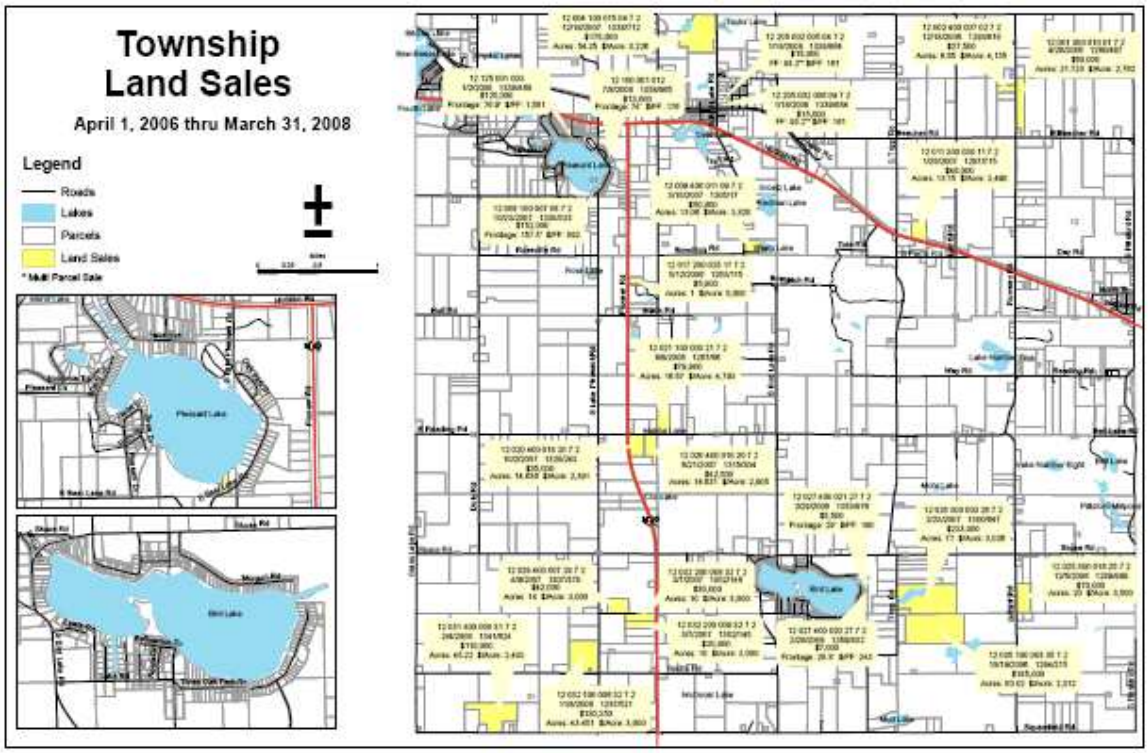
To set up a land value map system, you have to put together a set of maps for the entire assessing district. Types of maps that can be used include, but are not limited to, copies of tax maps; copies of recorded plats of subdivisions; City, Township, and County street maps; aerial photographs with map overlays; and zoning and land use maps. Maps need to be at a useful scale. Once a set of maps has been put together, known vacant land sales information which has been verified should be added to the maps. The sales information should be put on the map in an appropriate unit of comparison for the type of property involved. The land value conclusions of the assessor should also be added to the maps. This information will enable a property owner to see how his or her land has been valued as well as the supporting information behind that valuation. This

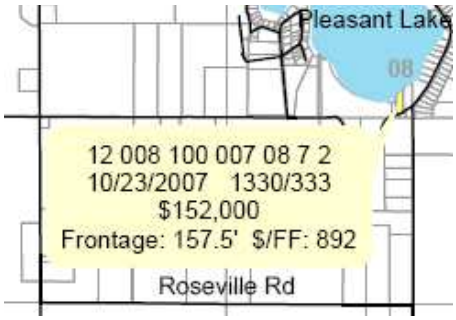
graphical presentation can be extremely helpful in explaining and defending assessments.

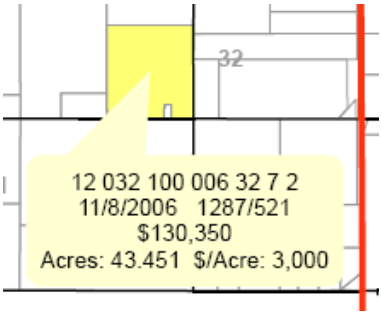
TYPES OF LAND VALUE MAPS

Land value maps can be prepared in different formats depending on the circumstances. A land value map for an urban area will be different from a land value map for a rural area. While the land value maps presented here were produced through the use of computers, it is not necessary to have that level of technology to produce an acceptable land value map; acceptable land value maps can also be produced by hand.

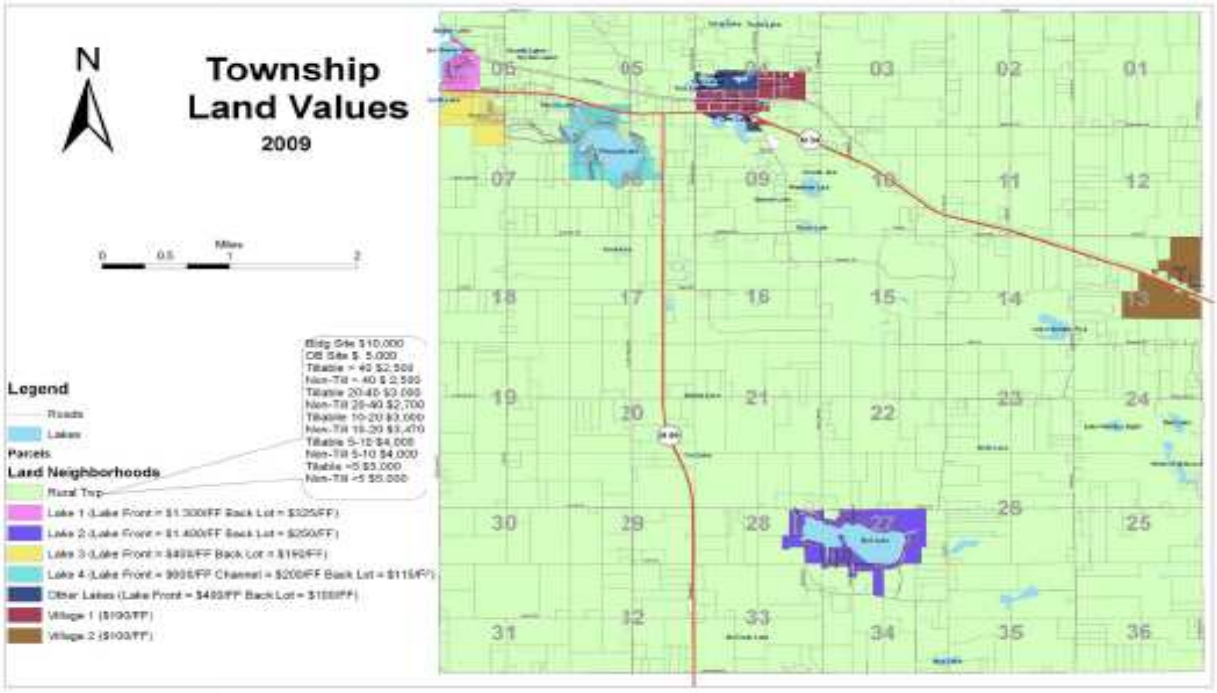
The following map shows vacant land sales information. The map is for a rural Township. Portions of the map have also been reproduced below the map to make them large enough to be read. Map should be printed in a scale that would allow the map to be legible. The sold parcels have been highlighted on the map and details regarding the land sale have been noted. The parcel number, the date of sale, the total sale price, and the sale price expressed in terms of a unit of comparison have all been noted for each sale on the map. This information is useful in establishing land values to be applied by the assessor.

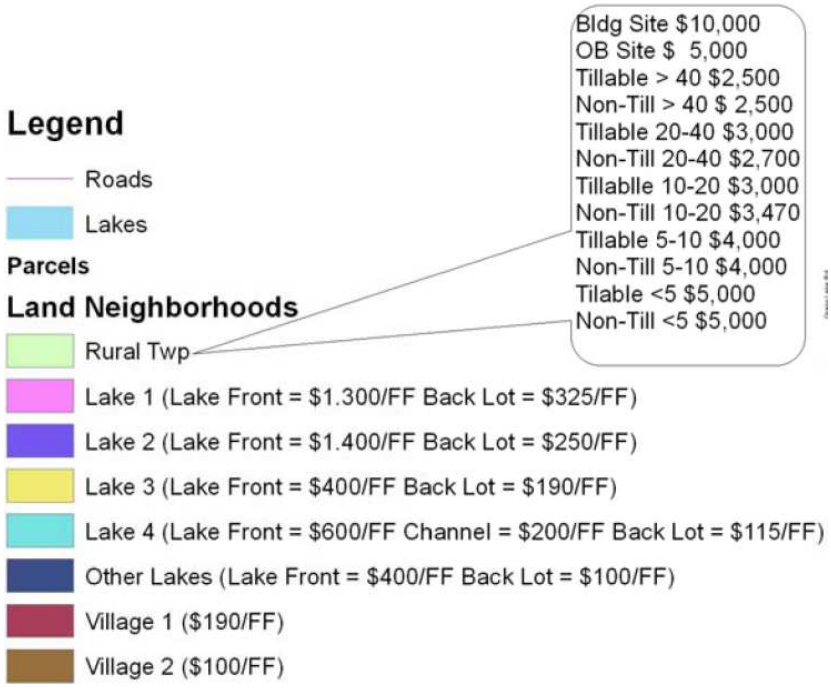






The map show above is one half of what is considered to be sound assessing practices with regard to land value maps. The other half is a map showing the land value conclusions used by the assessor to determine assessments. This map is for the same rural Township pictured in the map on the previous page but shows the value conclusions**.**





The legend from this map has been enlarged so that you can see the land value neighborhoods and the rates used for each neighborhood. Neighborhoods are broken out for tillable and non-tillable acreages, for lake areas and for the Villages within the Township (i.e., more dense developments). Any commercial or industrial areas should also be included. In many cases, this type of land value neighborhood breakdown will be sufficient. For a rural Township it is not usually necessary to have a significant number of land value neighborhoods. Often in cases like this, 'less is more' when it comes to land value analysis. Having too many land value neighborhoods can result in land value analysis complications due to a lack of sales information in each neighborhood, etc.

EXAMPLE LAND VALUE MAPS AND LAND VALUE DATA

Example land value maps and land value data are presented on the following pages and includes: Valuation of residential land in a hypothetical city; land sales information that has been verified, collected, and converted to equivalent front foot rates; maps produced using the land sales information and; application of the allocation method as support for land value conclusions reached by the City.

In Anywhere, Michigan, residential lots are valued on an equivalent front foot basis. Under this system, a lot that is deeper than the standard lot is assigned an increased value and a lot that has less depth than the standard lot is assigned a reduced value through the use of depth factors. The standard depth of a residential lot in the City of Anywhere is 120 feet. The depth factor table from the Assessor's Manual, is used in this example to adjust for differences in the depths of the different lots. The goal of the example situation is to arrive at an accurate front foot rate.

The table provided shows residential vacant land sales in the City from the two-year equalization study period. This represents all the verified residential vacant land sales activity in the City over this period. The table also shows the equivalent frontages for the sale parcels. Equivalent frontages have been divided into the sale prices to determine the sale prices per equivalent front foot. This provides indications of appropriate front foot rates for residential lots.

RESIDENTIAL VACANT LAND SALES FOR ANYWHERE, MICHIGAN

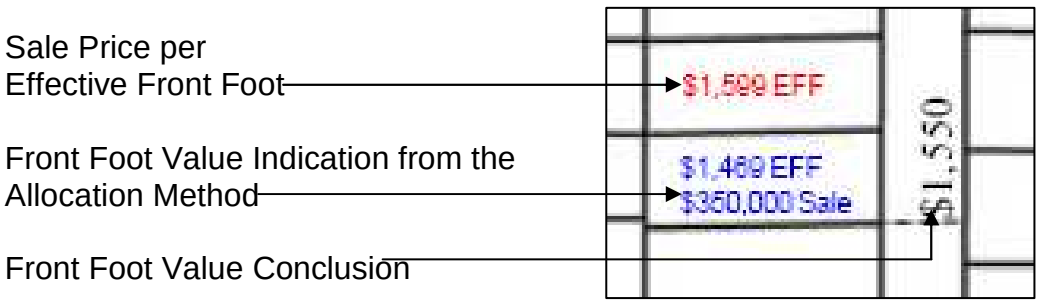
Parcel Number	Property Class *	Sale Date	Sale Price	Front Feet	Depth	Depth Factor	EFF	Sale Price per EFF
15-15-127-015	401	2/18/2011	$95,000	55.00	140.00	1.08	59.40	$1,599
15-15-128-016	401	11/22/2010	$75,900	44.50	140.00	1.08	48.06	$1,579
15-15-128-024	401	4/14/2011	$75,000	43.00	140.00	1.08	46.44	$1,615
15-15-130-002	401	4/27/2010	$80,000	65.00	86.00	0.85	55.25	$1,448
15-15-130-019	401	5/30/2010	$69,000	44.00	140.00	1.08	47.52	$1,452
15-15-132-012	401	6/6/2011	$120,000	92.10	124.00	1.02	93.94	$1,277
15-15-176-006	401	7/12/2011	$95,000	100.00	124.00	1.02	102.00	$931
15-15-177-012	401	12/20/2010	$82,500	50.00	140.00	1.08	54.00	$1,528
15-15-178-027	401	5/13/2010	$75,500	40.00	170.00	1.19	47.60	$1,586
15-15-181-005	401	3/10/2011	$82,000	50.00	132.00	1.05	52.50	$1,562
15-15-181-016	401	9/12/2010	$82,500	50.00	132.00	1.05	52.50	$1,571
15-15-182-005	401	5/5/2010	$84,900	50.00	148.00	1.11	55.50	$1,530
15-15-182-033	401	9/28/2011	$79,000	50.00	150.00	1.12	56.00	$1,411
15-15-202-014	401	10/24/2010	$65,000	50.00	130.00	1.04	52.00	$1,250
15-15-203-011	401	7/17/2010	$79,000	45.00	279.00	1.52	68.40	$1,155
15-15-204-015	401	3/13/2012	$95,000	72.85	120.00	1.00	72.85	$1,304
15-15-205-011	401	11/22/2011	$125,000	100.00	139.00	1.08	108.00	$1,157
15-15-206-010	401	10/30/2011	$105,000	90.50	120.00	1.00	90.50	$1,160
15-15-208-003	401	12/9/2011	$69,000	45.00	171.00	1.19	53.55	$1,289
15-15-208-018	401	9/21/2011	$95,000	60.96	171.00	1.19	72.54	$1,310
15-15-229-002	401	2/2/2012	$82,500	59.42	143.00	1.09	64.77	$1,274
15-15-230-004	401	8/17/2011	$69,500	48.00	149.00	1.11	53.28	$1,304
15-15-233-013	401	1/15/2012	$59,000	40.00	118.00	0.99	39.60	$1,490
15-15-254-016	401	1/11/2012	$64,900	51.00	120.00	1.00	51.00	$1,273
15-15-256-003	401	7/15/2011	$84,500	60.00	157.00	1.15	68.40	$1,235
15-15-258-003	401	11/13/2010	$72,500	50.00	120.00	1.00	50.00	$1,450
15-15-259-009	401	8/17/2011	$69,000	75.00	100.00	0.91	68.25	$1,011
15-15-260-002	401	1/11/2011	$82,500	60.00	159.00	1.15	69.00	$1,196
15-15-261-015	401	4/3/2011	$72,900	53.00	120.00	1.00	53.00	$1,375
15-15-279-003	401	11/29/2010	$50,000	50.00	133.00	1.05	52.50	$952
15-15-280-002	401	2/22/2012	$185,000	180.00	200.00	1.29	232.20	$797

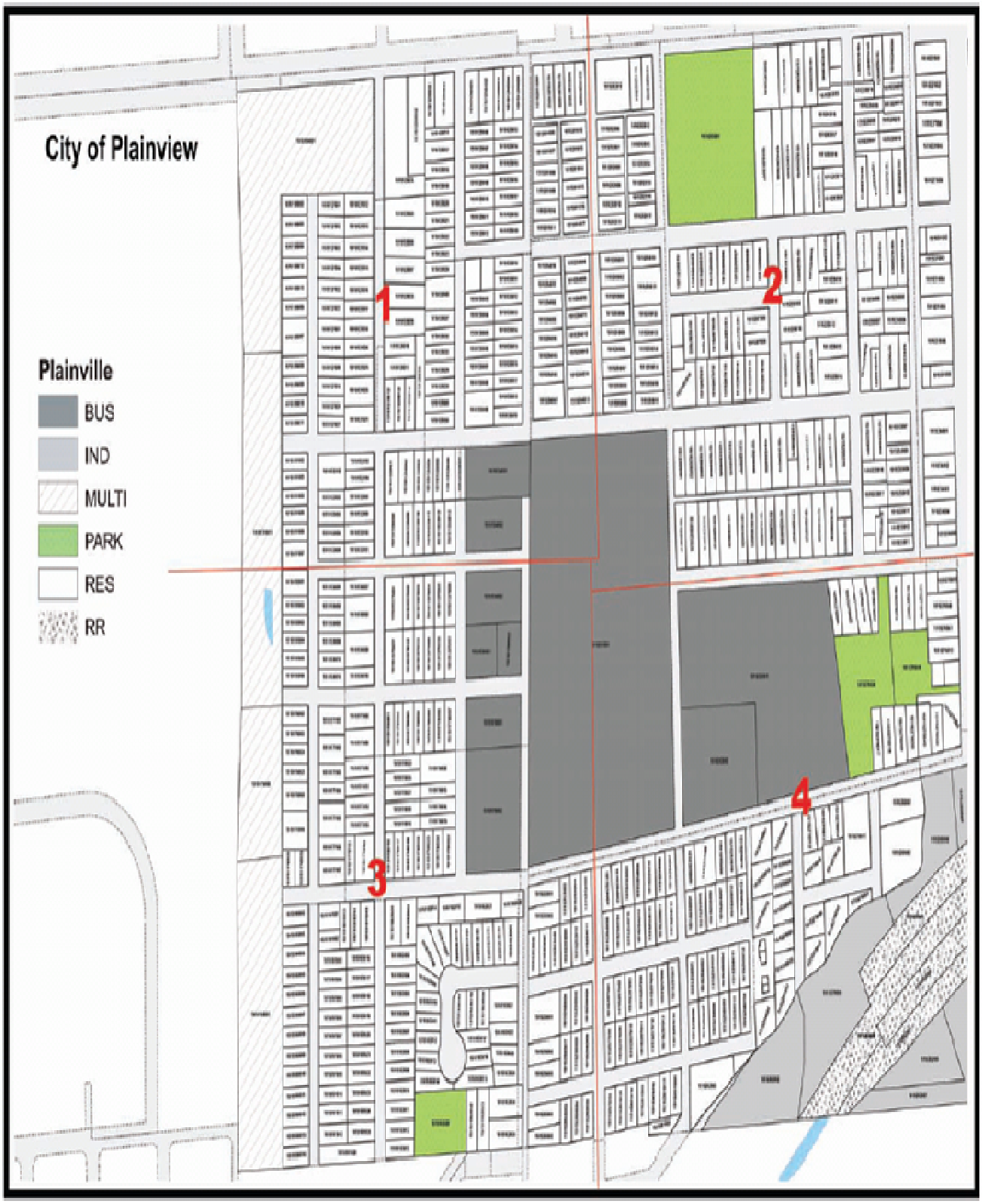
*401 = Residential Classification

*EFF = Equivalent Front Foot

Note: Using the preceding vacant land sales information, land value maps showing both prices and values have been created. All the vacant land sales have been plotted on four maps as shown below in the enlarged map area inset. For each sale, the verified sale price per effective front foot is shown. Also shown is the rate per effective front foot derived using the allocation method to support the vacant land sales information. Finally, value conclusions reached by the assessor to value the lots are shown in the road right-of-way areas. An overall City zoning map for the City of Anywhere is shown with additional maps showing smaller areas and the various land sales (in value per equivalent front foot) and the concluded land values for each street.

Enlarged Map Area




City of Plainview
Plainville
BUS
IND
MULTI
PARK
RES
RR
1
2
3
4


Section 1
$1,000 EFF $300,000 Sale = Improved Sales
$1,599 EFF = Vacant Land Sales
$6 = Other Values
$1,550 = Avg EFF
BUS
IND
MULTI
PARK
RES
RR
$6
$6
$1,550
$1,550
$1,550
$1,450
$1,450
$1,400
$1,579 EFF
$1,177 EFF
$445,000 Sale
$1,599 EFF
$1,469 EFF
$350,000 Sale
$1,615 EFF
$1,022 EFF
$369,900 Sale
$1,452 EFF
$1,304 EFF
$1,277 EFF
$25
$25
$30
$1,550


Section 2
$1,000 EFF
$300,000 Sale = Improved Sales
$1,550 EFF = Vacant Land Sales
$6 = Other Values
$1,550 = Avg EFF
BUS
IND
MULTI
PARK
RES
RR
$1,150
$1,250
$1,300
$1,400
$1,250
$1,400
$1,150
$1,150
$1,150
$1,250
$1,300
$1,250
$1,400
$1,157 EFF
$1,250 EFF
$1,406 EFF
$375,000 Sale
$1,398 EFF
$378,000 Sale
$845 EFF
$375,500 Sale
$582 EFF
$400,000 Sale
$1,289 EFF
$1,300 EFF
$1,160 EFF
$1,274 EFF
$1,140 EFF
$1,280 EFF
$1,495 EFF
PARK


Section 3
$1,000 EFF
$300,000 Sale
= Improved Sales
$1,699 EFF
= Vacant Land Sales
$6
= Other Values
$1,550
= Avg EFF
BUS
IND
MULTI
PARK
RES
RR


Section 4
$1,000 EFF
$300,000 Sale
= Improved Sales
$1,599 EFF
= Vacant Land Sales
$6
= Other Values
$1,550
= Avg EFF
BUS
IND
MULTI
PARK
RES
RR
$1,100
$1,094 EFF
$260,500 Sale
$20
$20
$25
$1,250
$1,273 EFF
$1,500 EFF
$290,000 Sale
$1,450
$1,450
$1,500 EFF
$300,000 Sale
$1,450 EFF
$1,011 EFF
$1,000
$800
$797 EFF
$900
$943 EFF
$5
$5
$5
$5
$1,350
$900
$1,350
$1,375 EFF

In reviewing the vacant land sales information, it was determined that the amount of vacant sales data was not ideal and that this lack of sales data would be a weakness in establishing residential land values in some neighborhoods in the City. It was decided to use the allocation method to support the value conclusions reached by the assessor.

The table below shows an analysis of sales of improved residential properties paired with sales of residential vacant land to determine the proper allocation. The analysis indicates that land value is approximately 25% of the total value of improved parcels, based on sales that have occurred in the City. That ratio was applied to a number of (verified) improved sales in town. The sale prices of the improved sales were also posted to the land value maps along with the equivalent front foot value associated with each improved sale. The equivalent front foot value was calculated by taking 25% of those sale prices and dividing the result by the equivalent front footage of each sold parcel. In this case, the resulting allocated land values were converted to equivalent front foot rates to be consistent with the unit of comparison used in other neighborhoods throughout the City. (See the maps on the preceding pages.)

CITY OF ANYWHERE, MICHIGAN LAND VALUATION BY ALLOCATION METHOD					
IMPROVED PARCELS			UNIMPROVED (VACANT) PARCELS		Ratio of Unimproved (Vacant) Sale Price to Improved Sale Price
Parcel Number	Sale Date	Verified Sale Price	Parcel Number	Verified Sale Price	
15-15-127-018	7/31/2011	$350,000	15-15-182-033	$79,000	23%
15-15-128-040	5/17/2010	$445,000	15-15-132-012	$120,000	27%
15-15-128-048	4/25/2010	$369,900	15-15-176-006	$95,000	26%
15-15-135-003	3/30/2012	$300,000	15-15-128-024	$75,000	25%
15-15-177-003	5/19/2011	$324,900	15-15-130-002	$80,000	25%
15-15-181-007	8/31/2011	$325,000	15-15-181-016	$82,500	25%
15-15-204-010	7/1/2010	$265,000	15-15-208-003	$69,000	26%
15-15-229-016	8/11/2010	$375,000	15-15-208-018	$95,000	25%
15-15-255-012	9/16/2010	$290,000	15-15-261-015	$72,900	25%
15-15-256-001	1/30/2012	$361,900	15-15-256-003	$84,500	23%
	TOTALS:	**$3,406,700**	**---**	**$852,900**	**25%**

4. AGRICULTURAL PROPERTY

Every county in Michigan has agricultural land. The agricultural classification of property includes a wide variety of uses, which are considered agricultural use. Section 211.34c of the General Property Tax Law provides that “agricultural operations” means farming in all its branches, including cultivation of the soil;

growing and harvesting of any agricultural, horticultural, or floricultural commodity; dairying, raising of livestock, bees, fish, fur-bearing animals, or poultry; turf and tree farming; and performing any practices on a farm as an incidental to, or in conjunction with these farming operations.

The method used to appraise any individual parcel of agricultural property will depend upon the most likely use of the parcel should it be sold. If the most likely use is as a cash crop farm, then the comparables should be sales of similar cash crop farms. For cash crop farms where soil productivity has a direct influence on value, a method known as the equivalent acreage method is commonly used to determine the value of soil. The equivalent acreage method is an appraisal technique which utilizes soil types and the productivity of each soil type to estimate the usual selling price. If the most likely use is a dairy farm, the comparables should be sales of similar dairy farms. If the most likely use is a change to commercial use, comparables should be sales of similar parcels being converted to commercial use.

Public Act 386 of 1976 provides that the value of land subject to a public right of way shall not be considered when the real property is being assessed. A later Attorney General Opinion stated “Land over which is located a county drain right of way is exempt. However, the legislature was careful to extend the exemption only to surface rights of way. Subsurface drains, or other rights of way, do not come within the exemption created by 1976 P.A. 386.”

AGRICULTURAL LAND VALUE INFLUENCES

Factors that influence farm land values can be grouped into general and specific categories. General factors influence the level of land values in a region and will commonly result in one area being known as a “fruit belt,” while another area will be known as a “cash crop area.” These factors include such items as:

1. Length of growing season
2. Precipitation
3. Proximity to and type of markets
4. Proximity to and type of transportation
5. Topography

Specific factors influence the land value of a limited parcel within a given region. Specific factors include such items as:

1. Productivity of the soil
2. Slope
3. Drainage
4. Management practices
5. Parcel size and shape
6. Quality and availability of water supply

Among the specific factors, parcel size and shape is sometimes given too little attention as to its effect on tillage operations. The presence of transverse ditches, pot holes, and other barriers can seriously reduce the value of otherwise productive land. The element of water supply should always be considered. Is there a plentiful supply? Are there restrictions on use? How deep are drilled wells? Is there an unusual mineral content? Can irrigation water be obtained from surface sources? Often, the issue is not supply but of quality for a particular use.

There are various combinations of the factors listed with the result that some areas may have unusually high land values for growing certain crops but similar land located elsewhere may exhibit very low land values for other crops. The first step an appraiser of farm land should take is to become familiar with general and specific factors which may have a bearing on the appraisal problem. There is a wealth of data available at various agricultural agencies in each county of the state.

5. Forest/Timberlands Property

Timberland or forest land typically includes parcels which are stocked with forest products of merchantable type and size and are not used for suburban or urban purposes. If you have determined that growing timber or other forest products is the dominating use of a parcel, the following are general procedures used to value forest or timberland property.

1. Determine the type or class of land. (Be certain the parcel is properly classified.)
2. Determine the type and extent of cover.
3. Determine the present and anticipated utilization of the parcel.
4. Estimate property values by comparing with similar properties. Any of the methods described later in this chapter may be used providing you correlate the method with the local market and apply the method in a uniform manner.

The forest land schedule must closely parallel the local forest land market at the time the schedule is used. Forest land values vary from region to region and can change over time. Land value schedules should be constructed from a background of experience in the sale or purchase of similar lands. There should be a substantial number of transactions to analyze. Lacking a good market for forest land, a preliminary schedule may be devised by careful analysis of the factors affecting land value. These schedules should then be carefully tested against a selected number of properties. If these properties sell at or near the schedule values, the schedules may be applied with a certain amount of confidence. The schedules should recognize all factors which will influence buyers or sellers of forest land. Depending on local conditions these factors may include: Site Quality, Species of Timber, Size, Age, Stocking, Terrain,

Accessibility to Market, Size and Shape of Tract, Commercial Values other than Timber, and Ease of Regenerating New Forest Stands

Chart Example:

Northern Hardwood	300
Lowland Hardwood	250
Aspen	225
Swamp Conifer	200
Pine	350
Lowland Brush	125
Upland Brush	275

Adjustments:

Market Location	–20% to +20%
Road Type	–10% to +10%
Harvest Seasons	–5% to +10%

Example of the use of the forest land value schedules:

S 1/2 of SE 1/4 of Section 21 containing 80 acres and located 15 miles northeast of Escanaba, Michigan. Paved county road boarders along the east side of the property. The land contains some seasonally wet areas that can be harvested during winters and dry summers. The remaining areas are dry. There are 38 acres of northern hardwood, 20 acres of pine plantation, and 11 acres of aspen.

Valuation:

38 acres hardwood x $300	=	$ 11,400
20 acres pine x $350	=	7,000
11 acres aspen x 225	=	2,475
1 acre road (exempt)	=	+ 0
Total		$ 20,875

COMPONENT METHOD

A common approach to buying forest land is to break it down into its components, assign a value to each, and add these values to determine how much to pay for the whole property. Components usually included are merchantable timber, young timber reproduction, minerals, and bare land. Although each component has a definite value if it can be acquired separately, the component cannot be readily separated in a forest or tree farm. The major weakness of this method is that it is difficult to assign correct values to each component, especially since some of them may not exist on all properties.

- Merchantable Timber Component

This is the value the property owner could receive if all of the timber is sold. This can be determined by estimating the volume of each specie and wood product on the land. Normally this must be done by a forester. The value of each specie product varies depending on its quality, ease of harvestability, quantity, distance from processing markets, and supply and demand. A fair estimate of its value can be determined by checking average stumpage receipts reported by the Michigan Department of Natural Resources. Once a volume and product value is determined, simply multiply the two values together to obtain the total value for the merchantable timber components of this method.

- Reproduction Component

Reproduction can not be sold; there is no commercial market for tree seedlings and saplings in a forest situation. Nursery stock, on the other hand, does have a value which is considerable and not within the scope of this discussion. The value of reproduction in the components system is an opinion of value estimated by the "industry." An estimate of the value of reproduction in 1995 (Upper Peninsula) ranges from $25 per acre for poorly stocked reproduction to $75 per acre for advanced, heavily stocked saplings.

- Mineral Component

A market for minerals exists, but the tendency is to base mineral appraisals on professional opinions instead of cash offers. Unless proven extractable minerals are known to exist on a parcel of land, this component should be ignored. It is listed because timberland also lies over reserves of coal, oil, gas, iron, copper, sand, and gravel. Although some of these minerals are extractable without damaging the productivity of a forest, they often require the removal of all forest products and the removal of the land from consideration as timberlands. These lands may properly be classified and valued as industrial land.

- Bare Land Component

The most uncertain component to be valued is that of bare land. It is almost impossible to find bare land for sale without its minerals, reproduction, and merchantable timber. As a result, the value is usually the result of an educated guess. For the purposes of timber management, bare land has a value only as a base for growing trees. It may have a value for speculation. Like the value of reproduction, the informed opinion of bare land ranges from $50 for poor, yet merchantable, timber land to $125 for higher quality sites (1995).

Occasionally a market will identify itself when a large number of parcels are clear cut harvested (removal of all trees) and then immediately sold. Although the mineral component is still intact, its value may be minimized as stated above.

Component Approach Problems

Problem 1:

N 1/2 of SE 1/4 of Section 21 containing 80 acres and located 15 miles northeast of Escanaba, Michigan. Paved county road boarders along the east side of the property. The land is seasonally wet but can be harvested during dry summers and autumns or during the winter. A cruise of the timber by a forester indicates that there are 1,580 cords of mixed aspen and 395 cords of mixed softwood. All of the timber is mature and ready for a harvest. The average value of mixed aspen is $11.56 per cord. The softwood is infested with budworm which has caused enough damage to reduce its value to $4.00 per cord. No known mineral value exists. Since the acreage is fully stocked with mature and over mature trees, no reproduction exists in the understory. Bare land of this nature generally is estimated to be worth $75.00 per acre.

Calculate the value of this property using the components method. 80 acres (1 acre road right of way)

Bare land 79 ac x $75	=	$5,925
Reproduction		0
Minerals		0
Merchantable timber		
Aspen 1,580 x $11.56	=	18,265
Softwood 395 x $4.00	=	1,580
Total property value		
by component method		$25,770

Problem 2:

40 acres, no road right of way, 20 acres of the total contains 21,000 board feet of red maple, 6,000 board feet of sugar maple, 2,500 board feet of beech, 435 cords of mixed hardwood pulpwood, small amount of reproduction ($25 per acre), 8 acres of grass and brush, 12 acres of aspen saplings ($75 per acre), no minerals. A check with the DNR forester indicates going rates as follows: Sugar Maple, $95/1000 bf; Red Maple, $55/1000 bf; Beech, $45/1000 bf; Hardwood Pulpwood, $10/cord. Estimated bare land value is $100/ac.

Merchantable Timber

Sugar Maple	$95 x 6 Mbf	=	$ 570.00
Red Maple	$55 x 21 Mbf	=	1,155.00
Beech	$45 x 2.5 Mbf	=	112.50
Hwd Pulp	$10 x 435 Cords	=	4,350.00
Total Merchantable Timber			$ 6,187.50
Reproduction			
Aspen	$75 x 12 ac	=	$ 900.00
Hardwood	$25 x 20 ac	=	500.00
Total Reproduction			$ 1,400.00
Minerals	No Value		0.00
Bare Land	$100 x 40 ac	=	$ 4,000.00
Total Value by Components Method			$11,587.50

The most common use for this method of valuation is to effect the trading of acreage between two forest land owners. Investors may employ this method but due to the inherent weaknesses, they generally use it only when market data is lacking or when a timber harvest is eminent and sale of the land can be assured within a reasonable time.

6. TAX MAPS

Tax maps are simply line maps showing the current parcel and usually have road, section boundaries, rivers, villages, or cities. You should be able to find any parcel in question by looking at a tax map. Tax maps are essential to doing splits and determining Principal Residence Exemptions on adjacent vacant land and as an overall aide in the assessment process. In order to properly assess, you have to know what and where you are assessing.

Essential items to be included on a tax map are:

1. Location and name of all streets, roads, alleys, lakes, railroads and other outstanding physical features.

2. The location of lot lines, property lines, or both; the dimensions, bearings and acreage where required.

3. Lot numbers, block numbers and parcel number by means of which each parcel as assessed may be identified.

Other information which may be included on a tax map:

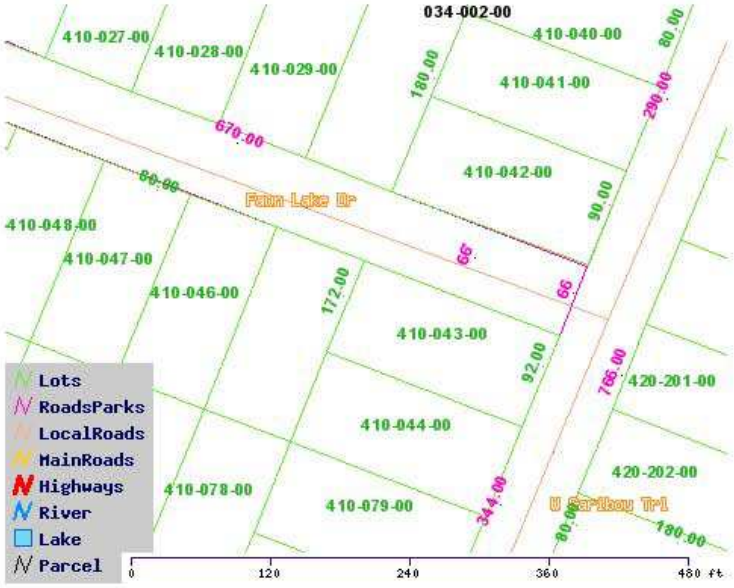
1. Ward or assessment district boundaries.

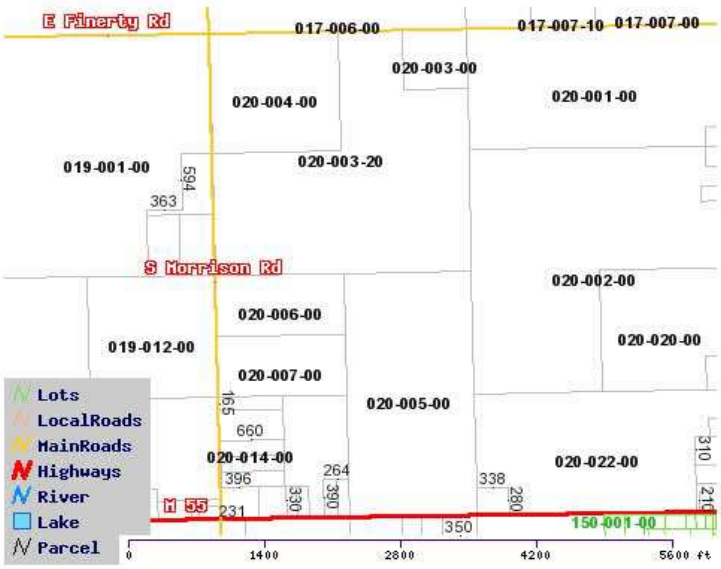
2. Names of public buildings, parks, churches and other more or less permanently tax exempt properties.

3. Names of property owners may be entered on the tax map however; the cost of keeping the map up-to-date is increased due to the necessity of making frequent changes of ownership on the map.

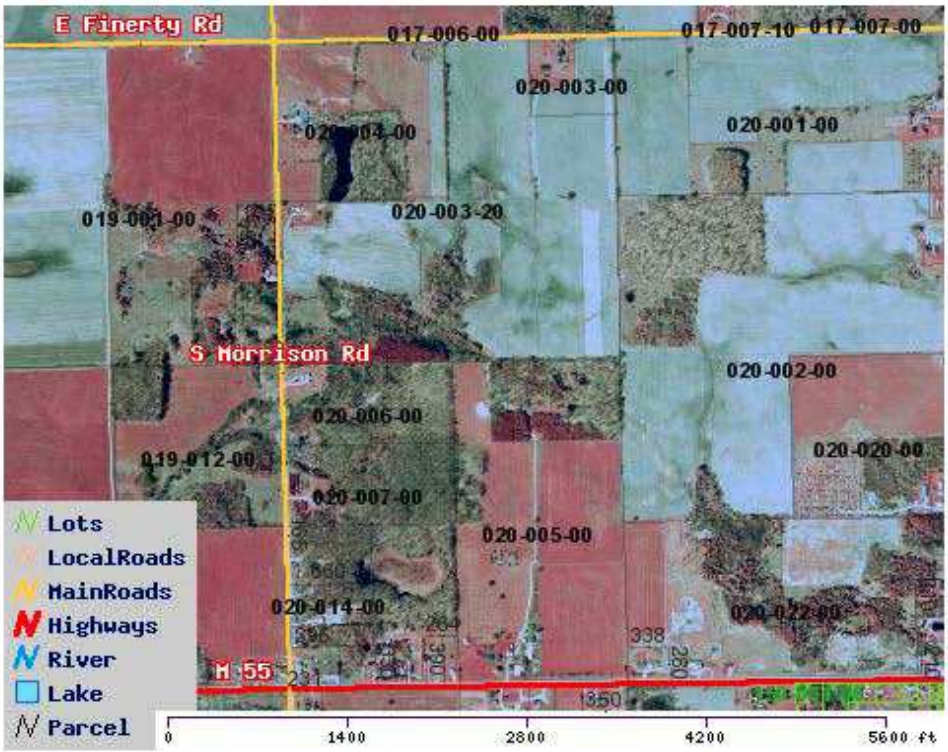
House numbers, assessed valuations, public utility services and location of improvements should not be placed on the tax map unless the scale of the map is 100 feet to the inch or more.

Tax Map Examples:





Tax Map Overlay on an Arial Photo:



Preparation of Tax Maps

The first step in the preparation of assessment maps of all types is to prepare a base or tax map. A tax map is a map drawn to scale which shows public highways, rivers, lakes, railroads and other outstanding physical features. The scale of the base map will depend upon the amount of information which is desirable to be shown on the completed map. In urban areas the recommended scale is 200 ft. to the inch; in strictly rural areas 1320 ft. to the inch which is 4" to the mile, or 660ft. to the inch which is 8 inches to the mile. Most recent professional tax mapping projects have used a scale of 100 feet to the inch in urban or dense resort areas and 400 feet to the inch elsewhere.

After the scale has been selected you need to decide upon the size of the completed map. Again this will depend on the ultimate use of the map. Following are the steps to be followed in preparing tax maps:

1. Lay out section lines according to the latest G.L.O. and Surveyor's Field Notes.

2. Plot meandered lakes and rivers according to the latest G.L.O. and Surveyor's Field Notes.

3. Plot the boundaries including bearings and distances of all recorded plats. Occasionally plats will be found which are inaccurately described or are not described at all. When these plats are found, adjoining plats with good descriptions should be mapped first, then the plat in question plotted by scaling the distances directly from the plat or by matching streets, alleys, etc. with adjoining plats.

4. Plot the balance of the lakes, rivers, etc. which are desirable to be shown on the base map from the enlargement of the aerial prints in areas outside recorded plats. Also check the location of meandered lakes as plotted from G.L.O.'s against the aerial photo scaled enlargements. In case the correct shore line on the aerial photo does not agree with the meandered shore line mapped from the G.L.O., indicate the G.L.O. meander line with broken lines and the correct shore line with solid lines. More often than not the actual shore line will not coincide with the G.L.O. meander lines along a lake or river because the surveyed meander line is a series of straight lines while the actual shore line is an irregular curve. Also meander posts or corners were more often set at the high water line or beach than at the water's edge actually encountered.

5. Plot the location of all highways and right of ways (width of road right of ways) which lie on section or quarter lines from the highway map and others from aerial or highway right-of-way maps. Show type of highway, highway numbers or names if desirable.

6. Plot railroad right-of-way, using railroad right-of-way maps. In rural areas of comparatively low value, only the center line of the right-of-way need be mapped; in urban and also in areas in which the railroad right-of-way forms the boundary of descriptions, the width of the right-of-way should be shown.

7. Plot streets, alleys, lot and block lines with dimensions and bearings where required and enter names, numbers and/or letters by which each lot is identified exactly as they appear on the recorded plat.