



STATE TAX COMMISSION OF MISSOURI ASSESSOR MANUAL

CHAPTER:

TECHNICAL ASSISTANCE

REVISION DATE: 2/1/2008

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5.0 INTRODUCTION

The office of assessor is probably the single most responsible office connected with the entire system of state and local taxation. In 2006, the property tax generated in excess of 5.5 billion dollars in revenue for local governmental entities. The work of the assessor lies at the very foundation of the system. Without effective administration, the burdens of taxation cannot be fairly distributed and the revenues needed to support government and its institutions cannot be generated.

The assessor's task of preparing an assessment roll which accurately reflects the true value in money of all taxable property within the county, in an efficient manner, is a tremendous challenge. Under Missouri law, assessments are set at a percentage of true value in money. Section 137.115 RSMo defines the percentages for each subclass of real and personal property. For example, residential real property is assessed at 19% of true value in money and most personal property is assessed at 33 1/3% of true value in money. Assessment accuracy refers to the degree to which each property in the county is assessed relative to the legally mandated percentage of true value. Assessment efficiency refers to the cost of assessment operations. The cost of assessment operations will vary with the type and nature of property within the county. Farm and commercial properties, for example, are more difficult and costly to appraise accurately than residential properties. Similarly, the appraisal of older custom built homes generally entails more time and expense than newer tract homes.

5.1 COMPONENTS OF AN EFFECTIVE ASSESSMENT SYSTEM

Knowing that an appraisal is an estimate of value and that an assessment is a statutory regulation of that value does not comprise the development of an assessment system. There are certain key components common to an effective assessment system:

- A. **Administration** Adequate budget, competent staff, effective internal controls, data processing and storage, and public relations.
- B. **Records** Accurate sales data, property ownership and characteristics files.
- C. **Assessment Maps** Maps which reflect ownership configuration and parcel identification.

D. Data Collection

Required data, accurate physical and economic data.

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| E. | <u>Valuation</u> | Effective cost approach, effective income approach, and effective sales comparison approach. |
| F. | <u>Statistical Studies</u> | Measure accuracy and uniformity of assessments. |

In total, these elements represent the foundation of a cost-effective assessment system. Each is briefly described below:

A. **Administration**

An adequate budget is the first requirement of an effective assessment system. The budget must be sufficient to develop and maintain an accurate data base and to provide the personnel and support resources necessary to apply sound appraisal techniques. Standards for assessment budgeting are difficult to specify due to the complexities involved in the assessment system and the varying status of an individual assessment county within that system. The cost of a reappraisal program, beginning with the establishment of an effective mapping system, accurate data collection, and the development of accurate valuations, on a per parcel cost basis, would be higher than that of conducting an ongoing assessment operation. The total cost of the statewide reassessment program completed in 1985 was \$121,826,966. The cost per parcel ranged from \$25.65 to \$73.24, with an average per parcel cost of \$49.86, over the course of the program. In 2006, the assessment maintenance program cost on a per parcel basis ranged from \$7.77 to \$29.06 with an average cost of \$16.58 per parcel.

Staff salaries tend to represent 80-85% of an assessment budget. A staff should consist of competent and qualified personnel. Appraisers either should have had prior experience or should receive on-the-job training. In addition, appraisers should be encouraged to achieve designation and attend advanced appraisal courses, seminars, and workshops. All personnel should be utilized so as to take advantage of their appropriate knowledge and skills.

Internal controls bring discipline to an assessment system. The assessor should maintain at least the following internal controls:

- An organizational plan

- Statements of duties and responsibilities
- Standards of practice
- Edit procedures
- Time and production reports
- Security procedures

Data processing systems reduce the time spent on routine clerical activities, speed mathematical computations, and generally improve assessment efficiency. In addition, computers can increase the accuracy of assessments by improving the quality and accessibility of data. Computers can be utilized in a number of assessment-related applications, including the storage of ownership files, automating the collection, organization, analysis of sale data and by automating the appraisal functions. In addition, computers are an effective tool for extracting the data for the myriad requests received by the assessor's office.

The assessor should not expect the installation of a data processing system to reduce the number of staff, nor to reduce the cost of operating the office. Major advantages of automation are that the same size staff should be capable of handling the increasing workload of the office for years to come with little or no additional help. With automation, staff should be able to perform a much better and more accurate job in less time and with less effort. Although an effective maintenance program can be accomplished without the use of data processing, given the ever increasing demands on the assessor's resources, automation represents one of the best ways to improve efficiency.

Extremely important in a good assessment maintenance program is sound public relations between the assessor, local officials and the taxpayers. The cooperation of the assessment office with both the individual taxpayer and citizen groups is important to ensure a wider understanding and support of systematic and uniform property assessments.

Good public relations require that the assessment official obtain and hold the respect and confidence of the taxpayer. Such respect and confidence is generated with the use of efficient, impartial, and effective methods and procedures. Whether on assignment in the field or in the office, the staff acts as official representatives of the assessor. It is, therefore, of the utmost importance that in all contact with property owners, tenants, and others, they conduct themselves so as to reflect credit to the organization and the work with which they are engaged. In any case, where an owner or occupant is

not clear about the purpose of field inspections and is reluctant to permit the inspection of the property, the assessor or deputy should explain briefly the objective of the field review. Such explanation will, in most instances, result in obtaining permission to proceed. Information gathered on the cost or appraised value of individual properties should be treated as private, although it is not confidential. Such information is critical in understanding the market, and should not be discussed or used for other purposes. The successful assessor conducts an open operation, explaining the assessment process as necessary, and responds promptly to inquiries and complaints. The more the assessor demonstrates that the responsibilities of the office are being performed effectively, efficiently and fairly, the more likely the public is to cooperate in return.

B. Records

The records of an assessor's office provide the foundation of the assessment system. Before property can be appraised and thus assessed, it must be located and described, ownership must be identified and the characteristics particular to that property affecting value analyzed.

To aid in the identification of property ownership, an effective set of records must be maintained. Requisites to the preparation of an assessment roll of high quality are records that detail ownership, property description and quantities, and methods or procedures for analyzing market value. Ownership indexes, both alphabetical and geographical as well as street indexes are valuable auxiliary records.

For real property, ownership data was compiled from past assessment rolls, deeds, and other records for the mapping program initiated during the statewide reassessment. Since 1985, every county has successfully maintained the ownership maps and, in turn, real property records on an on-going map maintenance program. Personal property ownership is maintained by several methods. One is simply through the mailing of the annual personal property rendition. In many counties, assessment staff have developed procedures to update ownership data based on information provided in cooperation with the collector, the 911 system and local service utilities.

The property characteristic file contains the current physical description and quantities of property. The real property record card (PRC) is an essential part of every assessment office. Personal property is inventoried on individual renditions or lists. The primary purpose of both forms is to

provide a compact format for use in preparing a physical inventory of property in the county. Depending on the degree of automation, the inventory of both real and personal property may be accessed, which allows the assessor to systematically list the pertinent data required in making value estimates, record assessments, and facilitate comparisons of property of the same class.

Proper valuation depends on the successful development of base values or selection of valuation guides. For real property, the systematic recording of reliable sales information is an essential requirement of making equitable assessments. The assessor needs to be aware of the interactions of buyers and sellers in establishing market values. The basic premise is that the value of property tends to be indicated by sale prices of comparable properties. Therefore, a sales file furnishes the best evidence of value that the assessor can use. For personal property, procedures must be developed that allow the assessor to maintain valuation guides that reflect market value, for example, using published guides for automobiles or farm machinery.

C. Assessment Maps

The assessor's office maintains a complete set of continuously updated assessment maps. Maps are fundamental to the assessment of real estate; they help determine the location of the property, indicate the size and shape of each parcel, and reveal its relation to pertinent features that affect value. It is a natural consequence that maps are a basic record in an assessor's office.

The use of assessment maps facilitates the identification of each parcel within a county and ensures that all lands are inventoried. Each parcel is assigned a parcel identifier or parcel number, which represents a specific land parcel and serves to reduce a lengthy legal description to a uniform and manageable expression. For more about the map and parcel numbering system, see section 5.7.

D. Data Collection

Assessments can be only as accurate as the data on which they are based. Therefore, if property data is incomplete or inaccurate, even the best appraisal procedures and techniques cannot produce accurate value estimates. Checks on completeness and accuracy of data involve both visual inspections to obtain and verify data and data edits to ensure that the data has been recorded correctly. If the appraiser knows that these tasks have been done or completes these checks at the

time of the actual appraisal, the criteria for data completeness and accuracy may be presumed to have been met.

In order to keep abreast of construction or major remodeling activities that alter the property data base, it is helpful if the assessor regularly receives information about building permits, when available. However, building permits should not be relied upon as containing a complete record of construction and major remodeling activities. Physical inspections or field review should be conducted on a regular and systematic basis.

To help ensure personal property is properly reported, an assessor may consult printouts from the Missouri Department of Revenue for vehicle registrations or from the Federal Aviation Administration for aircraft listings. Other potential sources would include records from the county or city clerk's office for business licenses or published business directories.

E. Valuation

For most personal property, valuation is a matter of identifying a source or published value guide that lists market values for the type of property found in the county. For livestock, monitoring local market activity will reveal the typical current price. Business personal property is generally categorized as to its typical life expectancy and depreciation applied to original or current cost. Effective in TY2007, business personal property, put into service after 1/1/2006, is to be assessed based on acquisition cost and depreciated according to the class life as published by the Internal Revenue Service (IRS) and found in IRS Publication 946.

Traditionally, there are three basic approaches applicable to the valuation of real property. These approaches are: the cost approach, where value is measured by the cost to reproduce a property of like utility; the sales comparison or market data approach, where the value of the subject property is estimated by the sale of similar property; and the income approach, where value is defined as the present worth of future income benefits derived from the property.

F. Statistical Studies

Sale ratio studies are the fundamental means of measuring the accuracy of the appraisal process.

These studies should be made to determine the level and uniformity of appraisals of selected property categories for which sufficient sale data is available. The sale ratio indicates a relationship of appraised value to market value. It is found by dividing the appraised value of the property under consideration by its recent sale price.

$$\text{Ratio} = \frac{\text{Appraised Value}}{\text{Selling Price}}$$

For example, a residence that sold recently for \$115,000 had an appraised valuation of \$100,000 at the time of sale. Therefore, the ratio of appraised value to selling price is 87%.

$$\frac{\$100,000}{\$115,000} = .87 \text{ or } 87\%$$

Since transactions in the marketplace bring out good estimates of value, a sales ratio analysis can be the assessor's yardstick for measuring the assessment level. For a review of other statistical tools, see section 5.7.

G. Summary

The nature of assessment clearly suggests the need for organization. In order for most assessors to approach their work in a systematic manner, the assessment function, its characteristics, and its political-economic environment should be examined briefly. The assessment function consists of the following basic elements:

- Discovery, the steps assessing officers must take to find and to describe taxable property
- Valuation, the appraisal of properties
- Listing, the keeping of records linking properties to their respective owners and the placing of assessed values and owner's names on the assessment roll.

Thus described, the assessment function appears relatively simple, while in reality, assessment is a complex process.

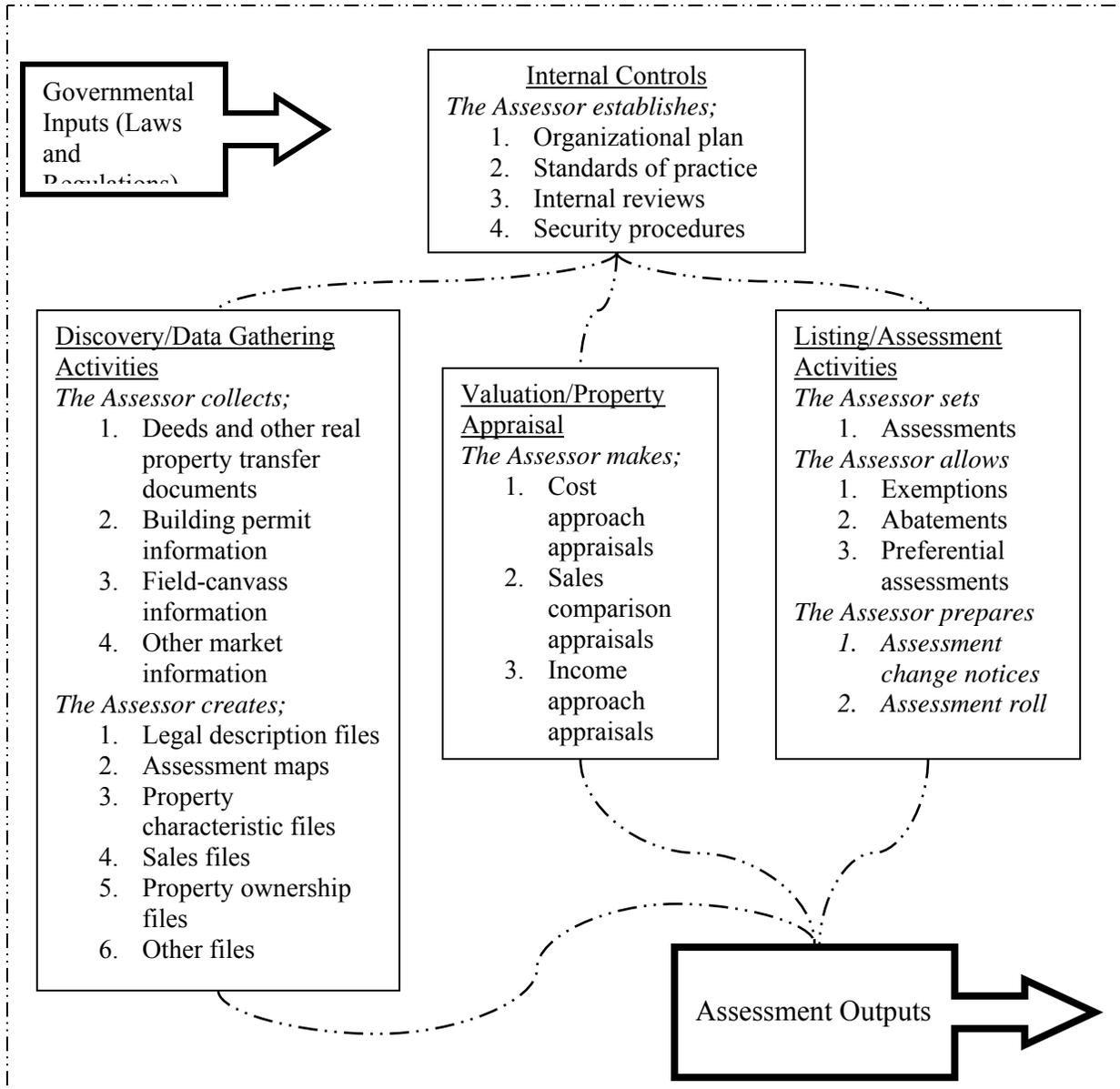
An appreciation of the characteristics of assessment is necessary for an understanding of assessment

operations and the recommendations made in this manual. The property assessment system consists of a systematic process designed to gather and collate factual data necessary to effectively carry out the assessment function. However, this system must operate within the bounds of the market and governmental environment in which both the public and the private sectors are acting, reacting, and interacting.

The system treats the discovery, listing, and valuation activities separately, although they are closely related in practice. The component parts of a real property assessment system, their interrelationships, and the flow of information in the system are illustrated below:

EXHIBIT 5.1

MAJOR ELEMENTS OF A REAL PROPERTY ASSESSMENT SYSTEM



5.2 THE MASS APPRAISAL PROCESS

Mass Appraisal is the systematic appraisal of groups of properties as of a given date using standardized procedures and allowing for statistical testing. More particularly, a mass appraisal system may be described as an orderly and comprehensive assemblage of facts, principles, and methods designed to carry out the assessment function effectively and efficiently in accordance with property tax policy. The term appraisal process is meant to encompass the techniques used by appraisers and assessors in formulating opinions of property values. It is an orderly procedure through which they are enabled to accomplish their objective--estimation of value. Also provided for are standards for a common terminology readily understood by those in the field of property valuation.

In short, it defines the problem, provides methods for solving the problem, and furnishes common appraisal language so that anyone informed on the subject readily understands the means through which a property value has been determined.

As the value of a property is the result of interactions within a constantly fluctuating marketplace, property value can never be absolutely measured or determined. The appraisal of property is not and never can be an exact science. An appraisal is an estimate of value, and as such, an absolute definitive value should not be expected, however, a reasonable estimate of value can be and should be obtained. Standards of reasonable performance do exist and there are reliable means of measuring and applying these standards.

Due to the large number of properties that must be appraised for assessment purposes, there is a point beyond which the appraisal process cannot be simplified if accurate results are to be obtained. There is also a point beyond which the process becomes so complicated the results will not justify the work and expense involved. It would be impractical to make a detailed, narrative type of appraisal on each property. Instead, a method of appraising on a volume or a mass basis has been

developed. When properly used, the mass appraisal process will, with few exceptions, give similar results as an appraisal made on an individual basis.

Basically, the same methods and procedures used for an individual appraisal are used in mass appraisal, although the application may be somewhat different. Appraisals made on an individual basis generally involve direct comparison between the subject and the specific properties. In mass appraisal work, a large volume of data (sales, income and expense data, construction cost and specifications) is developed into value indicators, or base unit values. When the base unit value is applied to a specific property, and modified by the adjustments applicable to that individual property, mass appraisal takes on the nature of direct comparison. The advantage and reason for using a mass appraisal system is to obtain accurate value estimates at a relatively low cost. Conducting a revaluation program requires careful planning.

Prior to planning any mass appraisal program, the assessment administrator must know:

- The condition of the present program
- The goals and standards which must be met
- The portion of present resources that may be reasonably allocated to the mass appraisal program
- What additional resources may be needed for the program
- The length of time available to complete the program
- The type of work activities required, and the volume of each type of work activity

After the above information is obtained, realistic plans can be formulated to meet the goals of a mass appraisal program.

The identification of available resources also has a major impact on goal establishments and the limitations placed by the availability of resources may, in some cases, virtually pre-plan the mass appraisal program. Resources that may be required by the assessor can be divided into four major areas: (1) Financial; (2) Personnel; (3) Data Elements; and (4) Data Processing.

The planning of a mass appraisal program is analogous to the appraisal of an individual piece of

CHAPTER:

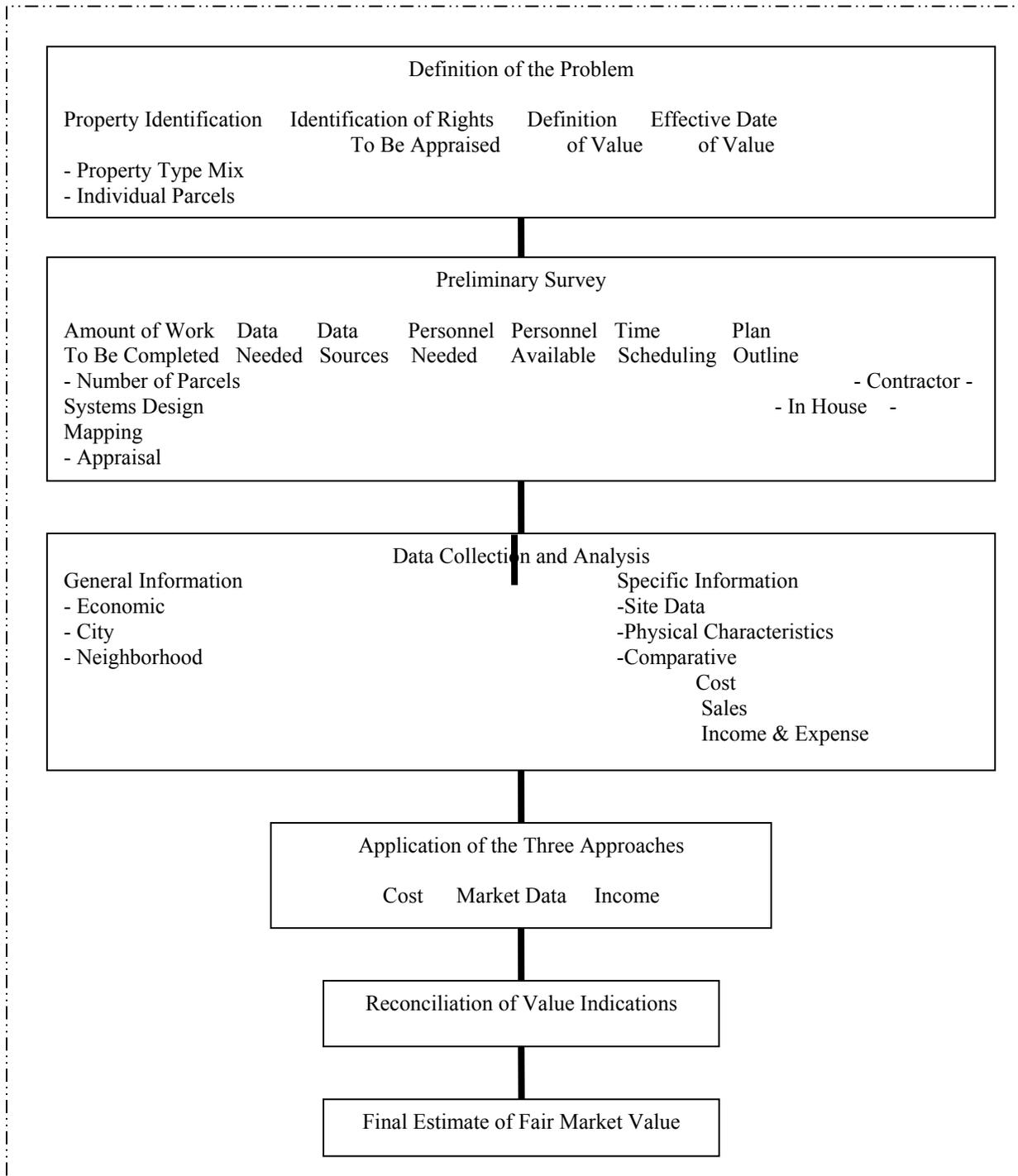
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property in that it may be formulated in compliance with the appraisal process.

EXHIBIT 5.2
THE APPRAISAL PROCESS



1. Define the Appraisal Problem

The beginning point in any appraisal problem is the identification of the property to be appraised. The mass appraisal process begins with the discovery and identification of all parcels within the county. A parcel is defined as all contiguous land owned by the same legal entity and of a single use within a section. It may be delineated by a metes and bounds description, lot and block within a subdivision, or a combination of both. In a mass appraisal program, the identification of a particular piece of property is usually conducted on a geographical basis with the aid of current ownership maps. A system of continually updated ownership maps show the size, shape, and location of each parcel of real estate and ensures that all taxable parcels are listed on the assessment roll.

The ownership maps serve two important functions. One is that it provides an inventory of property and secondly, a system of parcel identification. The work of the assessor in both the office and the field requires constant reference to information relative to a particular parcel of property. By organizing the records by parcel number, property records can be efficiently referenced and indexed. In most counties, an alphabetical index file of ownership is maintained which facilitates locating data when only the owner's name is known.

Another important factor in defining the appraisal problem is the mix of property types. The property type mix varies from county to county, and has a great impact on the resources needed to complete the assessment update. In Missouri, real property assessments are required to be updated every two years, (in the odd numbered year), and knowing the quantity and types of property allows the assessor to better estimate the time frame, manpower needs and production targets. Property types can be defined any number of ways. Typically, assessors track the number of residential, agricultural and commercial parcels and whether they are improved or vacant. In counties with a large area owned by the federal government, a count of the exempt parcels may help the assessor to better estimate the resources needed. For a detailed discussion on estimating manpower, time frame or production targets, see the text on assessment maintenance plans - personnel estimation charts, section 5.3.

After the property has been identified, the rights of ownership pertaining to that property must be identified. In the majority of instances, property should be appraised as if owned in a fee simple title, that is, all rights of ownership of the property are retained by the owner of the fee interest. However, there are exceptions, probably the most notable of which is that of severed mineral and surface rights. In such a situation, two distinct interests have been created for the same legal description and must be assessed as such. Another exception is a situation where a possessory interest exists. A possessory interest is usually thought of as a right to the use of a publicly owned property by a private entity. For instance, the Hertz counter at a publicly owned airport.

As part of the definition of the appraisal problem, the definition of the value sought must be determined. Pursuant to Section 137.115, RSMo, all properties are to be appraised at true value in money. In Missouri, the courts have defined true value in money as the highest price paid, in terms of dollars, which a property will bring if offered for sale for a reasonable period of time, both buyer and seller being fully aware of all the uses to which the property may be put and neither being under any compulsion. However, for general property assessment purposes those lands actively devoted to agricultural and horticultural purposes, as defined by Section 137.017 through 137.026 RSMo, shall be valued in accordance with guidelines set forth by the State Tax Commission. These procedures are discussed more fully in Chapter VII.

In the first statewide reassessment, the effective date of all appraisals was January 1, 1985. Since 1986, assessors have operated on a two-year assessment maintenance cycle, with real property assessment updates occurring each January 1st of the odd year.

2. Conduct a Preliminary Study and Outline the Appraisal Plan

In preparation for the statewide reassessment, preliminary studies were conducted and a determination made as to the amount of work which had to be done, new mapping systems were developed, appraisal systems selected, data collection procedures designed and computer systems

were implemented.

Since 1985, the focus of the preliminary study and assessment maintenance plan has shifted. Where before it was an almost overwhelming task to select and implement the necessary systems, it is now a matter of identifying areas which need updating or improvement and ensuring the resources are available to complete the project.

As part of the preliminary survey, an analysis will have to be made of the total personnel requirements and the staff presently available. Personnel may need to be hired and trained, work plans and assignments made, and quality control checks instituted. Such an analysis should include the number of clerks both needed and currently available for research and clerical functions, the number of appraisers (time must be allocated for regular maintenance work, new construction, etc.), and if data processing is available, the amount of work to be done by automation will need to be determined.

With the determinations made as to amounts and types of work to be done and the completion date of the program determined, time schedules for each of the varying activities involved in the program may be developed and phase delineation charts constructed.

At this point in the preliminary survey, the assessor should have enough information available to make the very basic decision as to who will conduct the appraisal update process. That is, whether the resources available are sufficient to conduct the program in-house or whether a contract will be needed for some services.

3. Develop and Analyze Market Data for the Three Approaches

The next step in the mass appraisal process is collection and analysis of market data. In an effective appraisal system, there is a need for collection and analysis of market data for cost information, comparative sales information, and for income and expense information. The data collection of cost information is to assist in the establishment of cost manuals or for the updating of an existing

manual. Cost manuals are used in estimating the replacement/reproduction cost of a building. Comparative sales data is used in almost every aspect of the mass appraisal process. It is used in estimating the value of land and estimating the value of improved real estate through the use of the market data approach. Comparative sales data may be the basis for the establishment of ratios or trends which can be used in property valuation as a benchmark for adjusting past appraisals. The comparable sales information is also useful where a computerized appraisal system is being utilized. In mass appraisal, it is during the market analysis phase that the base land rates and building costs are established. In addition, the sale data is also used to determine rates of depreciation and to set up depreciation schedules.

A system should be devised for the efficient collection of all market data that would relate to the value of any type of property. Much of this data can be systematically collected and then can be tabulated and supplied to the appraisers so that they can perform their task more efficiently, giving a quality job on a quantity production basis. Clerical personnel can be utilized to collect sales from deed records, property owners via mail, and published sale data services. Appraisal personnel should collect data through personal contact with property owners, brokers, managers, tenants, builders, and developers. General information from business and population trends and indications of increases and decreases of values for areas within the county should be noted. Trade journals will indicate trends for particular types of businesses, and zoning and building practices may help establish neighborhood patterns.

An appraisal is an opinion of value which is formed by a mental process that considers physical and economic value influences as indicated by sales, cost, and income value indicators. Therefore, since appraisal includes a large number of variables that must be considered in the valuation of each property, base standards or values must be developed through the analysis of the basic sales, cost, and income information contained in the data file. The following list illustrates some of the items which would be considered base standards.

A. Cost Index

Information from builders, new home sales, building supply houses, and government indexes are used to establish a cost index for use with the cost manual.

B. Depreciation Benchmarks

Sales, cost, and published tables are analyzed and developed into local guides for depreciation to be used on various types of improvements.

C. Income and Expense Guides

Information gathered from income producing properties is tabulated in order to establish economic rents and typical expenses.

D. Capitalization Rates

Sales are analyzed to establish the interest rate applicable to investment properties. Recapture and tax rates must also be established.

E. Gross Rent Multipliers (GRM)

Relationships between sale price and income are analyzed to determine GRM's to be used on various properties.

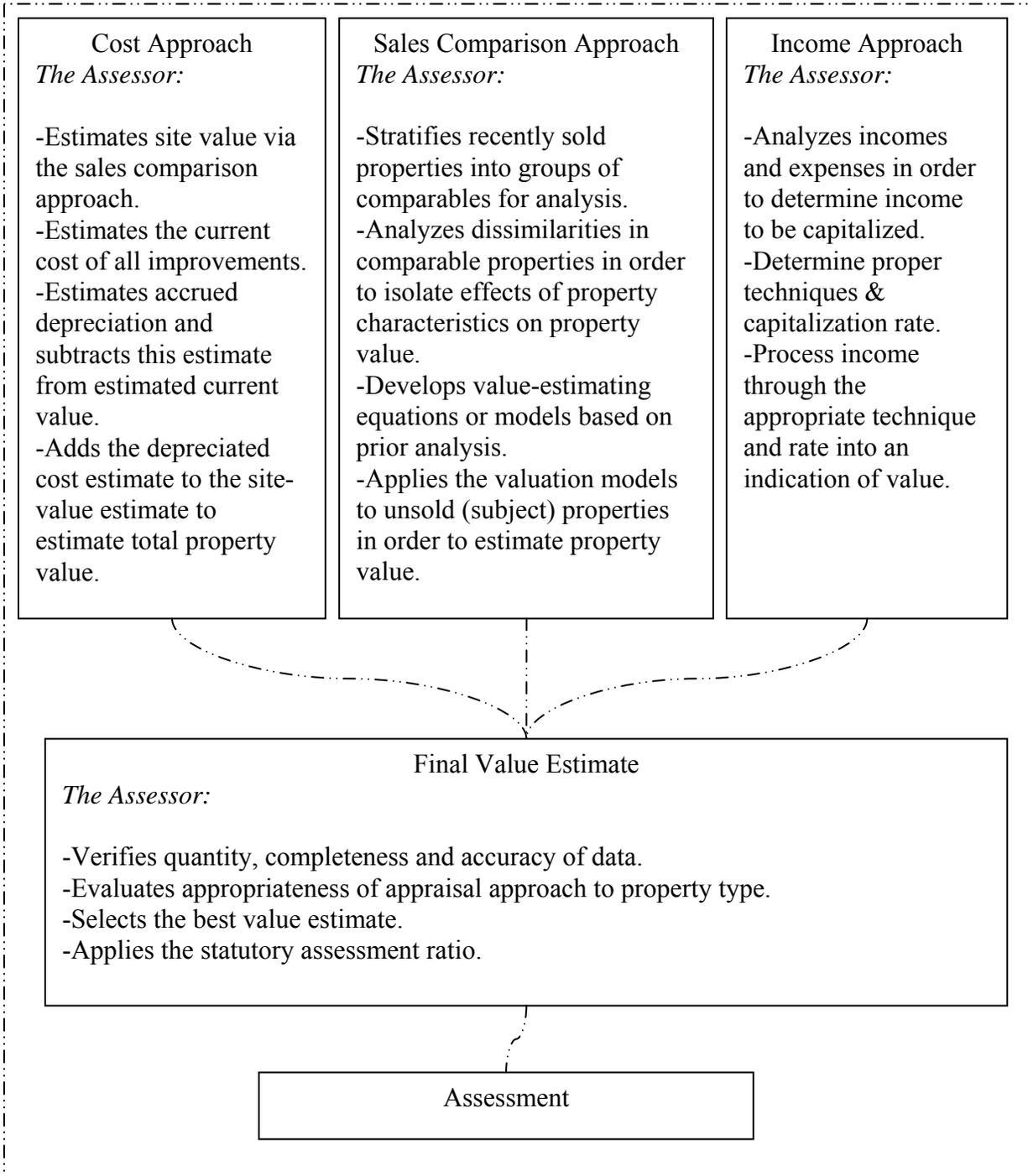
F. Basic Unit Values

From sale analysis and land residuals, unit values for land and various types of properties are set.

4. Application of the Data

The basic data applicable to each of the three approaches to value is converted into base units and adjustment factors which are used to develop the final estimate of value for each property being appraised. To be effective, the entire valuation process must incorporate in proper balance the three approaches to value. (See *Exhibit 5.3*).

EXHIBIT 5.3
REAL PROPERTY
APPRAISAL



A. Sales Comparison Approach

The action of the market shown in prices paid for real property is a highly reliable indicator of value. It follows that the value of property might be reliably estimated by observing and analyzing the sale prices of comparable properties. This technique, often referred to as the “Sales Comparison Approach”, is dependent upon the availability of sale data of comparable properties and the validity of the judgments made in regard to the adjustment for their similarities and dissimilarities. Due consideration must be given to all the tangible and intangible factors influencing values such as location, construction, age, condition, desirability, and usefulness. In each case, prime consideration must be given to the time and conditions of each sale.

The selling price of comparable properties set the upper and lower limits of value, or the range, within which the value of the subject property should fall. Analysis of the value factors influencing each sale enables the appraiser to narrow the range down to a value level that is most applicable to the subject property.

The significance of this approach lies in its ability to produce estimates of value which directly reflect the attitude of the market. Its widest application is in the appraisal of vacant land and residential properties when there are enough sales from which to select comparable properties. However, even in these categories, an assessor in rural Missouri is severely hampered by the complete absence of certificates of value. Without this very valuable tool, the assessor is forced to expend great amounts of time and resources to gather the information.

B. Income Approach

The income approach has its widest application in the appraisal of income-producing property. Commercial property is bought and sold on its ability to generate and maintain a stream of income for its owner. The value of such property is a measure of the quantity, quality, and durability of the

future net income that can be expected to be returned to an investor.

Since the justified price paid for income-producing property is no more than the amount of investment required to produce a comparable desirable return and since the market can be analyzed in order to determine the net return actually anticipated by investors, it follows that the value of income-producing property can be derived from the income stream which it is capable of producing.

The mathematical process for converting the net income produced by property into an indication of value is called capitalization.

The capitalization process evolves out of the principles of perpetuity and termination. "Perpetuity" affirms that the net income produced by land will continue for an infinite period of time. "Termination" affirms that the net income produced by a building will stop after a certain number of years. This in effect is to say that all buildings at some time in the future will cease to have an economic value.

If the income flow produced by a building will terminate in the future, it is reasonable to suggest that the investor in buildings is entitled to the return of his investment in addition to a return on his investment. In the capitalization process, this recovery of the investment is referred to as recapture.

Several methods of capitalization are currently employed by appraisers. The capitalization methods most prominent are direct, straight capitalization with straight-line recapture, and annuity. Each of these are valid methods for capitalizing income into an indication of value, the use of one or the other depends on the characteristics of the income stream.

The value of income producing property can be derived by measuring the net income against the net return anticipated by informed investors. This can be expressed in terms of a simple equation:

$$\text{VALUE} = \text{NET INCOME} / \text{CAPITALIZATION RATE}$$

This capitalization rate should consist of percentage provisions for the return on the investment to land and buildings (interest rate) plus a return of the investment in the wasting asset (recapture). Net income refers to the residue of the potential gross income (having been adjusted by an allowance for vacancy and collection loss) remaining after all allowable operating expenses are paid. Selecting the proper capitalization rate and accurately estimating a realistic gross income along with applicable operating expenses are essential to the capitalization process.

C. Cost Approach

If the highest and best use of a property is its present use, an evaluation can be made by estimating the value of the land as if it were vacant and adding the depreciated cost of reproducing the improvements to the estimated land value.

The cost of “reproducing the improvements” as applied here refers to the replacement cost or the current cost of reproducing the improvements having equal characteristics with the subject property, which may or may not be the cost of producing a replica property. The distinction being drawn is between Replacement Cost, which refers to replacement of a substitute improvement of equal utility, and Reproduction Cost, which refers to replacement of an exact replica of the improvement. In any event, both replacement cost and reproduction cost have their application in the Cost Approach to value, and the differences are reconciled in the application of depreciation allowance.

The replacement cost includes the total cost of construction incurred by the builder whether preliminary to, during the course of, or after completing the construction of a particular type of building. Among these direct and indirect costs are material, labor, all subcontracts, builder’s overhead and profit, architectural and engineering fees, consultation fees, survey and permit fees, legal fees, taxes, insurance, and the cost of financing.

There are various methods that may be employed to estimate replacement cost new. The methods most widely used in the appraisal field are the unit-in-place method, component-part or segregated method, and the model or comparison method. The unit-in-place method is employed by

establishing in-place prices for the various components (lumber, concrete, steel, etc.) of a building or similar improvement. This method of using basic independent units can be extended to establish larger component prices such as entire walls in place or entire heating systems for a given area. The unit-in-place and segregated cost methods are generally used when the structure under appraisal is sufficiently unique in characteristics that it will not conform to a type and quality combination as listed in the cost manual. A further extension leads to the model or comparative method in which unit prices are established for the entire structure on a square foot or cubic foot basis. Depending on the method used, the unit prices are then multiplied by the respective quantities (linear feet, cubic feet, square feet, number of units, etc.) of each as they are found in the composition of the building, the sum of which is equal to the replacement cost.

The cost approach then takes on great similarity with the comparison method in that the subject properties to be appraised are compared with models to establish a base cost. Additions to and deductions from the base cost are then made in order to account for any variations in specifications and characteristics between the property and the base model. A cost index or cost multiplier may then be applied to adjust the base cost to current cost at the effective date of appraisal.

Replacement cost new represents the upper limit of value. The difference between replacement cost new and the present value is "depreciation". The third and final step in completing the cost approach is to estimate the amount of depreciation or the loss of value from all causes. There are two distinct kinds of depreciation: deterioration, generally referred to as physical depreciation; and obsolescence, generally categorized into functional and economic depreciation. Physical depreciation may be readily defined as being the loss in value due to wear and tear, time, and the actions of the elements. An estimate of accrued physical depreciation represents the opinion of the appraiser as to the degree that the present and future appeal of a property has been diminished by its physical deterioration. There is no steady rate of physical depreciation. Actual age alone is a poor criterion. Physical depreciation begins while a building is under construction and continues until the life of a structure is at an end. The physical life of a building is dependent upon the degree of maintenance which it receives, upon the type and quality of the materials which are used in the

construction, and upon the soundness of the methods employed by the builder.

Functional/economic depreciation may be generally defined as being the loss of value due to forces other than physical deterioration which act upon a structure in such a way as to limit its economic life. Functional depreciation refers to obsolescence resulting from conditions within the property such as an imbalance in construction features, architectural treatment, or design and arrangement which tend to lessen its desirability. Economic depreciation refers to obsolescence caused by influences outside the property such as physical, economic, social, and governmental changes which have an adverse affect upon the stability and quality of the neighborhood in general and the property in particular.

The significance of the cost approach is that it is the one approach that can be used on all types of construction. Its widest application is in the appraisal of property where the lack of adequate market and income data preclude the reasonable application of the other approaches to value.

The particular data relative to an individual parcel of property are collected and recorded on a property record card. The field appraiser completes the property record card as he measures the property, identifies the various property components affecting value, grades the structure as to the quality of construction, and places the structure's dimensions in the appropriate spaces on the card. The property record card is also used for updating or making additions or deletions to an existing property. There is no need to revisit, remeasure, and recheck every property every year. However, base values should be updated periodically and properties should be revisited at least once every two years. Once the property record card has been properly filled out and the improvement properly graded, with emphasis on the quality of construction, the property record card is returned from the field and the card, cost manual, land schedules, sale data, and income information are merged into a final value estimate. In many instances, the individual who measures the house and lists it in the field is not the same individual who actually places the ultimate valuation on the property record card. This is a perfectly legitimate procedure and in most cases the only manner by which a large number of appraisals may be accomplished within a specified time frame. Mass appraisal, by its

very nature, dictates some degree of production-line appraisal. The use of standardized schedules and manuals provides the uniformity and equality which is necessary in maintaining a fair tax system. The end result, therefore, of the valuation portion of the assessment flow chart would be an equitable value estimate.

5. Correlation

Correlation of the mass appraisal program includes review by the supervising appraiser and comparisons between properties to establish that uniformity at market value has been achieved. With the final estimate of the defined values, the appraiser has achieved the immediate objective of the appraisal process. The value estimates should be the appraiser's opinion reflecting the application of his experience and judgment due to a consideration of all the assembled data.

6. Final Estimate of Value

The final phase of the assessment maintenance program deals with the assignment of the final value to each parcel appraised. Under Missouri law, assessments are updated each January 1 of the odd year and are to remain unchanged the subsequent even year, unless there is new construction or improvement to the parcel.

Prior to the final compilation of the real property assessment roll in an update year, a change notice should be mailed to all taxpayers of the new assessed valuation to be placed on the property. The purpose of this notice is to allow, prior to the local board of equalization, a review of the property's valuation. The notice should contain information such as the parcel number, the assessed value by subclass for the current and past year and a brief explanation of the appeal process. See *Exhibit 5.4* for a typical taxpayer change notice.

Thus described, the assessment system is a complex operation that requires knowledge and understanding. A detailed discussion and methods of application relating to these major components

of the reappraisal process are covered in later sections of this manual. The purpose of this manual is to assist the local assessment personnel in developing and managing a mass appraisal system that is efficient, accurate and equitable.

EXHIBIT 5.4
TAXPAYER CHANGE NOTICE

Map Parcel Number: _____

School District: _____ City: _____ Road District: _____

Name: _____

Mailing Address: _____

City, State, Zip code: _____

Situs Address of Property: _____

Property Description: _____

Previous Appraised Value for 2006:

Residential	Agricultural	Commercial	Total
_____	_____	_____	_____

Previous Assessed Value for 2006:

Residential	Agricultural	Commercial	Total
_____	_____	_____	_____

Appraised Value as of January 1, 2007:

Residential	Agricultural	Commercial	Total
_____	_____	_____	_____

Assessed Value as of January 1, 2007:

Residential	Agricultural	Commercial	Total
_____	_____	_____	_____

If you have questions concerning this notice please call 555-555-1234 within fifteen (15) days of receipt of the notice. If your questions cannot be answered, or if you are not satisfied with an explanation, an informal meeting will be scheduled with an appraiser. In addition, the laws of the State of Missouri provide that you may appeal any assessment to the County Board of Equalization by calling 555-555-9876 before June XX, 2007.

* * * Abated Property Summary * * *

As provided by law the following value has been abated in Superior County
for tax year 2007

Chapter 99	Chapter 135	Chapter 353
999,999,999	999,999,999	999,999,999

5.3 ASSESSMENT MAINTENANCE PLAN

In 1986, the seventy-first general assembly passed legislation which provided for the on-going maintenance of the just completed statewide reassessment. Key provisions included:

- a two-year assessment cycle
- requirement of an assessment maintenance plan
- state funding of the assessment maintenance program

With passage of this legislation, the State Tax Commission began putting into place the framework for the on-going assessment maintenance.

1. Two Year Assessment Cycle

Under section 137.115 the assessor is required to annually assess all real and personal property, however, the statute was re-worded to say that the assessor "...shall annually assess all real property in the following manner: New assessed values shall be determined as of January first of each odd-numbered year and shall be entered in the assessor's books; those same assessed values shall apply in the following even-numbered year, except for new construction and property improvements which shall be valued as though they had been completed as of January first of the preceding odd-numbered year..." Thus the two-year assessment cycle was created.

2. Assessment Maintenance Plan

In addition to the creation of the two-year assessment cycle, the legislation requires the county assessor to prepare and submit an assessment maintenance plan. The Commission created a sample maintenance plan patterned after the reassessment plan used by most counties. The assessment

maintenance plan includes the following components:

- Functions and Responsibilities
- Charts and Reports
- Personnel Estimation Chart/Employment Schedule
- Phase Delineation Chart
- Plan Budget

The objective of the assessment maintenance plan is to outline how the assessor is going to maintain both the real and personal property assessments, making the best use of the resources available.

Since 1986, the time line for developing, reviewing, approving and monitoring a county assessment maintenance plan has typically been:

- September to November of the Odd-Numbered Year: the Commission, based on legislative changes, reports and staff recommendations, drafts a letter to each county assessor outlining objectives and key concerns to be addressed in the upcoming assessment maintenance cycle.
- November to December: County assessors develop their assessment maintenance plan, and submit to the State Tax Commission and County Commission by January 1, of the even-numbered year.
- December, odd-year to April, even-year: the Commission reviews and approves assessment maintenance plans.
- January, even-year through December, odd-year: County assessors and staff implement the approved assessment maintenance plan, while the Commission staff monitors activity for compliance to the approved plan.

A. Functions and Responsibilities

The primary functions and responsibilities are broken into two sections, one for real property and one for personal property, see *Exhibit 5.5*. The key functions and a brief explanation of each function are provided. The assessor completes the item by identifying the personnel who has primary responsibility for the function and adds any comments relative to the item.

For example:

Sales Clerk II

3) Sales information. Obtain, verify, and log

Comments:

sales information from all sale letters. Other

Sale letters will be mailed daily, and responses will be processed upon receipt. PRC copies made, attached to the sale letter and input for study.

sources include certificates of value, real estate agents, appraisers, banks, savings and loans, etc.

In the example, the assessor has indicated that the Sales Clerk II has primary responsibility for the mailing of sale questionnaires or letters. In the comment the assessor indicates how the responses will be handled. The advantage to listing the position and the comments is two-fold. One, it communicates to county staff the jobs or tasks for which they are responsible, and two, it identifies for the Commission the county's key players. By doing so, the Commission staff knows who to contact when checking on a particular function, and does not waste their time or the county's time by requesting updated information from the wrong person.

The functions and responsibilities list the primary items in an assessment maintenance program. Individual counties may add items to fit individual needs. Urban counties with a large number of staff may need to adjust the listing to reflect the specialized nature of its organization. Rural counties with minimal staff may find the same position title listed many times, due to the more generalized responsibilities.

B. Charts and Reports

The section is simply a listing of the standard charts and reports, whose use has been recommended by the Commission for use in an assessment maintenance plan, see *Exhibit 5.6*. In completing this section of the plan, the assessor simply lists the date that the chart or report will be completed for the proposed plan. For example, the proposed quarterly budget should be prepared and submitted with

the plan; therefore, a date of January 1 of the even year would be listed. On the other hand, the bi-annual report on abated property is not due until November 1st of the odd-year and, therefore, its completion date would be between the close of the assessment roll (May/June) and its due date. If a chart or report is not to be utilized, the assessor lists “Not to be Used” on the blank provided for the specific item.

EXHIBIT 5.5

Real Property FUNCTIONS AND RESPONSIBILITIES

Job Title Comments		Responsibility
	1.	Public information and public relations - on going.
	2.	Update mylars, property record cards, work index cards, final alpha cards and/or other related forms. Complete on a quarterly or monthly basis. Ownership data will be maintained to within _____ months.
	3.	Sales information. Obtain, verify and log sales information from all sale letters. Copy corresponding PRC and file with the returned sale letter. Other sources may include certificates of value, real estate agents, appraisers, banks and savings & loans, etc. All sale information will be available for review and use by the Commission.
	4.	Building Costs. Obtain and verify current building costs. The new construction log will be utilized to identify and locate new construction samples.
	5.	Conduct sale analysis of all available sales. Studies will be conducted to determine the base rates for building costs, land values, and rates of depreciation-both physical and obsolescence.
	A)	Building Cost Index for 2009. An index study will be completed and submitted by June 30, 2008 to the Commission for their review and approval.
	B)	Depreciation studies will be completed and submitted to the Commission by June 30, 2008 for review and comment. In addition, studies will be conducted by neighborhood to identify obsolescence.
	C)	Land value studies will be conducted by neighborhood and land rates will be established which when properly applied result in a fair and reasonable land value for parcels assessed at market value. These studies will be submitted to the Commission for review and comment by June 30, 2008.

EXHIBIT 5.5 continued, page 2 of 4

Job Title Comments		Responsibility
	6.	Complete interim untrended index study, based on additional average quality, new construction, to be completed and submitted to the Commission by October 1, 2009.
	7.	Sale Ratio Studies: Will be conducted by neighborhood or other strata. The object being to determine the relative level of assessment between the county's appraised value and the sale price of the sold property. Complete on a Quarterly basis and generate summary by neighborhood or strata, listing the number of sales, the low, high, mean, median and weighted mean ratios, C.O.D., P.R.D. and the time-frame of the sales used within the study.
	8.	Recalculate all proposed 2009 land values and improvement costs, up to replacement cost new prior to conducting field review, to be completed by ___/___/2008.
	9.	Conduct final field review . If you do not intend to complete all of steps A through H, please provide a narrative that describes your final review and how market values will be developed.
	A)	Inspect recently sold properties to establish bench marks. Update neighborhood sales analysis. Based on the updated neighborhood sale analysis, corrective actions will be outlined and implemented to ensure final 2009 values will reflect local market conditions.
	B)	Review, data collect, and photograph all new improvements and additions.
	C)	Review changes resulting from mapping splits or combinations.
	D)	Verify accuracy of all physical data, quality grades of improvements, subclassification of land and improvements. Property records will be updated to reflect changes or to correct errors. Take new photographs if none exists, or the improvement's condition has substantially changed.
	E)	Review land value and apply adjustments as needed.

EXHIBIT 5.5 continued, page 3 of 4

Job Title Comments		Responsibility
	F)	Assign depreciation to improvements. Depreciation will be assigned to reflect the physical condition and obsolescence applied (whether economic or functional) as needed, to ensure the final value reflects current local market conditions. Notes will be listed on the PRC to explain any adjustments.
	G)	Adjust agricultural land grades where required, changing the agricultural maps and property record cards accordingly.
	H)	Update review date on property record card.
	10.	Complete final calculations following field review, data entry and finalize your estimate of market value.
	11.	Income. Obtain and verify income and expense information for commercial property. Review records for 2006, 2007 and 2008.
	12.	Develop appropriate capitalization rates for income producing properties and calculate their values by the income approach.
	13.	Prepare notices to taxpayers for increases in value, (by _____ annually).
	14.	Conduct informal meetings with taxpayers, (complete by _____ annually).
	15.	Prepare for and defend values at board of equalization annually.
	16.	Complete the real property assessment roll (by 5/31 annually - 6/1 for township counties - 5/1 for City of St. Louis).

EXHIBIT 5.5 continued, page 4 of 4

**Personal Property
FUNCTIONS AND RESPONSIBILITIES**

Job Title Comments	Responsibility
	1. Mail State Tax Commission approved personal property assessment forms by (2/1 annually).
	2. Process railroad and utility returns for appraisal of locally assessed property (by 4/20 annually).
	3. Process State Tax Commission approved personal property assessment forms
	4. Prepare second notice to taxpayers whose assessment list has not been received (by 4/1 annually). Track and log late lists, penalties and waivers.
	5. Complete the personal property assessment and real estate rolls (by 5/31 annually - 5/1 for City of St. Louis).
Additional Comments:	

EXHIBIT 5.6

CHARTS AND REPORTS

The following charts and reports have been recommended by the State Tax Commission. We intend to prepare and incorporate into the plan the selected charts and reports by the date shown.

Date Available		
	A.	Parcel Count. All parcels, both taxable and exempt, including manufactured homes on leased land, REA's, CATV's, and other unmapped parcels where applicable.
	B.	Proposed budget through December 31, 2009.
	C.	Phase Chart through December 31, 2009.
	D.	Personnel Estimation Chart through December 31, 2009.
	E.	Employment Schedule through December 31, 2009.
	F.	Organization Chart to show overall responsibility and accountability.
	G.	Duties and responsibilities itemized for each personnel position.
	H.	A narrative description of all major phases, including standard procedures and assignments of responsibility.
	I.	A training outline for all personnel.
	J.	A detailed field manual for data collectors.
	K.	Abated property report. To be submitted by November 1, 2009.
	L.	Annual Computer Inventory. A summary of disk usage by system users, and anticipated maintenance costs expected for the year. To be submitted by March 31 each year.

C. Forms to be Utilized

Similar to the Charts and Reports, there is a listing of recommended forms to be used in the assessment maintenance program, see *Exhibit 5.7*. The primary difference is that the forms are used for activities that are of a day to day nature whereas the charts and reports are items that run the course of the assessment maintenance plan or cycle.

Most of the forms listed are self-explanatory; however, a few explanations may be beneficial.

- Income and Expense forms are used to gather specific information which may be used to develop typical income and expense rates for income producing property.
- Split tax statements are used to allocate a single parcel's value between multiple taxpayers, e.g. a landlord owns multiple lots, and for income tax purposes wants the taxes split between each lot and its improvements.
- Second notice for non-returned assessment lists, as required by statute, the assessor is required to notify taxpayers who fail to turn in a personal property assessment list by March 1.

Examples of each of these forms are found in *Exhibit 5.7*.

EXHIBIT 5.7

FORMS TO BE UTILIZED

The following forms have been recommended for equalization and maintenance purposes by the State Tax Commission. We intend to incorporate the following forms into the plan and submit them by date shown.

Date Available		
	A.	Sales questionnaire for mailing
	B.	Income and expense forms
	C.	Assessment change notice
	D.	Informal hearing forms
	E.	Board of equalization forms
	F.	Split tax statement forms
	G.	Statistical Analysis forms
	H.	Data verification forms for new construction
	I.	New construction log
	J.	Project control log to track different phases by map sheet
	K.	Map count log to track parcel counts by map sheet
	L.	Real estate and personal property assessment roll pages
	M.	Individual and business personal property lists
	N.	Second notice for non-returned assessment list

D. Personnel Estimation Chart and Employment Schedules

Successfully estimating personnel needs is critical to conducting the assessment maintenance program. If estimates are too low, then the scheduled work will be completed late or not at all. If estimates are too high, then excess cost will be incurred. The following is a standard formula for estimating the number of personnel needed:

$$\frac{\text{Parcels}}{\text{Quantity X Days}} = \text{Personnel Needed}$$

Where:

Parcels is the amount of work to be accomplished, e.g. the number of parcels to be worked

Quantity is the standard production level, the number of parcels one person can typically work in one day

Days is the number of working days in the phase

On the form Personnel Estimation Calculations, the formula is set up slightly different, however the results will be the same.

The following example demonstrates that both methods will yield the number of personnel needed for the task at hand. Say for example, that there are 13,500 improved parcels which need to be entered into the computer system. One person, on average, can data enter 65 parcels per day. How many people will it take to complete data entry over a four month (average 18 work days per month) period? The formula and calculations would be as follows:

$$\frac{13,500}{65 \times 72} = 2.88$$

or calculated using the Personnel Estimation Calculations page:

Phase	Number of Parcels	Standard Level of Production	Work Days Required	Total Work Days	Persons Needed
Data Entry	13,500	65	207.7	72	2.88

As you can see, either method calculates the same number of people needed. The trick to estimating personnel is in identifying the amount of work to be done, correctly estimating a reasonable standard level of production and allowing a reasonable amount of time to complete the assignment.

Using simple algebra, the variables may be rearranged to compute time frame needed or daily production targets. For example, the assessor has two people available for data entry, 13,500 parcels to be keyed in, and each can enter about 65 parcels per day. How many days should be allowed in the phase for data entry?

$$\frac{13,500}{65 \times 2} = 103.8 \text{ days}$$

So if the assessor is unable to obtain additional personnel, either due to costs or training considerations, then the time frame could be extended from 72 working days to 100 or 105 (that is, to allow six months rather than four).

The number of working days in the phase may be estimated by considering the following:

Maximum Working days per year:	260	(52 weeks x 5 days/week)
Vacation days per year:	10	
Sick days per year:	10	
Days lost due to weather:	5	
Holidays	12	
Days for training/meetings	<u>5</u>	
Net working days per year	218	

or $218/12 = 18.17$ working days per month

In estimating the number of working days in your county, you want to be sure to adjust for lost time according to local conditions. For example, if your county provides three weeks vacation per year you would deduct 15 days not 10 as in the example. Typically plans will be based on 18 to 20 working days per month.

To check the availability of staff, the number of people needed for each phase can be entered into the “Personnel Estimation Calendar” and the numbers summed for each month. By listing the total people needed each month; the assessor can quickly see where the peaks and valleys in staffing will occur and determine what actions will be needed. For example, do you hire additional staff for one or two months, or do you reconsider the time frame for the tasks and spread the work over a longer period to stabilize personnel needs? Most assessors do not have the luxury of adding people for short periods of time, rather, it becomes necessary to adjust the phase time frame and/or adjust the expected production level. See *Exhibit 5.8* for the Personnel Estimation Calculations and *Exhibit 5.9* for an example of the Personnel Estimation Calendar.

EXHIBIT 5.8

PERSONNEL ESTIMATION CALCULATIONS

County :

2008-2009

PHASE	NUMBER OF PARCELS	STANDARD LEVEL OF PRODUCTION	WORK DAYS REQUIRED	TOTAL WORK DAYS	PERSONS NEEDED
Change Notices					
Public Traffic					
Mapping Transfers					
Mapping Splits & Inking					
Sales Letters					
Sales Data Entry					
New Appraisal System, Data Entry					
Preliminary Calculations					
Final Review					
Final Calculations					
Office Review					
Data Entry, Real Estate					
New Construction Review					
Final Calculations, New Construction					
Office Review New Construction					
Data Entry, Real Estate - New Const.					
Prepare & Mail P.P. Lists					
Process P.P. Lists					
Data entry, Personal Property					
Informal Hearings					
Board of Equalization					

Standard Level of Production

= Number of items that can be done by one worker in one day

Work Days Required

= Number of Parcels / Standard Level of Production

Total Work Days

= Number of work days available in a phase (from phase chart)

Persons Needed

= Work Days Required / Total Work Days

EXHIBIT 5.9

PERSONNEL ESTIMATION CALENDAR

County :

2008

PHASE	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Change Notices												
Public Traffic												
Mapping Transfers												
Mapping Splits & Inking												
Sales Letters												
Sales Data Entry												
New Appraisal System, Data Entry												
Preliminary Calculations												
Final Review												
Final Calculations												
Office Review												
Data Entry, Real Estate												
New Construction Review												
Final Calculations, New Construction												
Office Review, New Construction												
Data Entry, Real Estate - New Const.												
Prepare & Mail P.P. Lists												
Process P.P. Lists												
Data Entry, Personal Property												
Informal Hearings												
Board of Equalization												
Total												

Standard Level of Production = Number of items that can be done by one worker in one day
 Work Days Required = Number of Parcels / Standard Level of Production
 Total Work Days = Number of work days available in a phase (from phase chart)
 Persons Needed = Work Days Required / Total Work Days

E. Phase Delineation Chart

The phase delineation chart is useful in laying out the key phases in the assessment maintenance plan. The chart is broken into six primary areas which include:

- Administration
- Mapping
- Market Analysis
- Real Estate
- Personal Property
- Hearings

Within each of the six primary areas are listed a number of specific phases. As with the other components of the assessment maintenance plan, a county assessor may supplement the sample chart with additional items as needed.

(1) Administration

- Taxpayer Change Notice or Assessment Increase Notice. Under 137.180 RSMO, whenever any assessor increases the valuation of any real property, the assessor is required to give notice to the owner of record of any such change. While the statute does not specify a date for the notice, the Commission recommends that notices be sent in early spring. By doing so, this allows the assessor and staff to conduct informal hearings prior to the close of the assessment rolls.
- Assessment Rolls are due to the county clerk by a specific date as outlined in the table below. In the phase chart, the assessor is showing the time frame for completing the assessment roll. The specific tasks of the phase will be defined by the assessor and may vary by county. Typically, the phase consists of final data entry and proofing of the assessment rolls.

ASSESSMENT ROLLS DUE TO THE COUNTY CLERK

3rd/4th Class	Township Counties	2nd Class	1st Class	City of St. Louis
May 31 137.245	June 1 137.425	May 31 137.245	May 15 137.375	First Monday In May 137.510

- The abated Property Report is a listing of property which contains abatements granted under one of three statutory sections. The three sections include Chapter 99-Tax Increment Financing, Chapter 135-Enterprise Zones, and Chapter 353-Urban Redevelopment Projects. Under 137.237, the assessor is required to submit the listing to the State Tax Commission by November 1, of each odd year.

(2) **Mapping**

- Sale Data Collection is best described as the process of mailing sale questionnaires, processing returned sale letters and preparing the necessary data so that the appraiser may analyze the information. Typically, this is a daily activity, however, in some counties, due to limited resources; there may be periods of time that this work is put on hold, for example, during the late spring when the assessment rolls are being finalized.
- Property Transfers is the process of collecting deeds, plats, surveys and other documents from the recorder's office and processing to identify changes in real property ownership, creation of new parcels and deletion of combined parcels.
- Work Maps refers to the updating of the ownership maps on a temporary basis. Most counties

maintain a set of work maps which are used to pencil in changes to parcel boundaries. Typically, the work maps (or blue line maps or composite maps) are updated as the deeds or other documents are processed so that changes in parcel boundaries can be plotted. Work maps will become the source document for the inking of the final ownership overlay maps.

- Inking Updates are completed after the deeds and other documents are processed and the work maps updated. In counties with relatively little activity, that is the creation or deletion of parcels, inking will occur once or twice a year. In counties with a lot of activity, inking updates may be a daily activity.

(3) Market Analysis

The degree to which the biennial update will succeed is dependent on the quantity and quality of the market analysis. The greatest obstacle faced in the assessor's office is the lack of sale data upon which to base the comparisons in the appraisal process. The market analysis consists of four basic studies which gauge the quality of the appraisals and help determine the base rates or levels for cost, land and depreciation. For a more detailed discussion on market studies and sample forms, see section 5.9.

- Sale Ratios/Obsolescence are studies completed on a regular basis to determine the quality of the assessor's appraisal relative to a parcel's sale price. When conducted on a regular basis, e.g. quarterly, it allows the assessor to keep up with local market activity. The results of a neighborhood sale ratio study not only illustrate the relationship between appraisals and sale prices but provide an indication as to how consistent or uniform the appraisals are relative to the sales of property. Sale ratios conducted early in the assessment cycle should indicate how much change is needed, whereas studies conducted late in the cycle show assessors how successful the update has been.
- An index Study is typically done once each year. The results provide the basis for the update to

be completed in the current cycle. The interim study is primarily used to monitor market activity, which provides an indication as to how costs are changing.

- Land Studies are conducted once each cycle. In these studies sales are analyzed to determine the base land rates, whether they are front foot rates, square foot rates or acreage rates.
- Depreciation Studies are also conducted each assessment maintenance cycle. The objective is to take directly from the market an indication as to the amount of depreciation a building has suffered.
- Income and Expense studies are useful in determining the typical market rates for income and expenses of income producing property. Where the data is available, the results can provide the best indication to value for property that is held for income producing purposes.

(4) Real Estate

- Preliminary Calculations refers to the time needed to apply a new cost index and calculate an updated replacement cost new (RCN) and update base land values. For counties with an automated appraisal system, this phase is generally a very short period of time. For counties who are converting to an automated system, this phase may be used to represent the initial data entry of the cost system components. For counties who update manually or are converting to an automated system, allowing sufficient time is critical to the timely implementation of the assessment maintenance plan.
- 20___ Final Review is the phase where the assessor outlines when the parcel by parcel review for the odd-year update is to take place. The distinction between this phase and the new construction review is that in the final review a parcel by parcel review is conducted, checking closely for changes in physical characteristics, additions and deletions, and the reassignment of depreciation(or condition). In addition, any new construction and improvement is noted and

valued. It is during this phase that values are set for the upcoming odd-year update as well as the subsequent even year.

- 20__ New Construction Review is the phase conducted during the odd year for the subsequent even numbered year. It is primarily a time to identify, list and value new improvements and construction made to a property. Improvements that have been razed should be identified and the value deducted, however, adjustments in value due to economic situations are not made.
- Office Review is a time set aside to finalize values for the upcoming odd-year update. During this phase, the assessor and staff review in the office the updated values, resolve any questions or disparities and finalize values. A key objective to the office review is to ensure that comparable properties are valued consistently and that any unusual or extreme values are reviewed and either corrected or substantiated.
- 20__ Data Entry is the phase set aside for completing the necessary changes to the assessor's final records. Depending on the county's degree of automation, this may simply be the data entry of the final values for each parcel of real estate or it may be the time required to edit each appraisal record.

(5) **Personal Property**

- Prepare and Mail Lists refers to the time needed to print, address and mail the county's personal property lists. Typically mailing is completed by early January of each year.
- Process is the time needed to receive and value property listed on the returned personal property assessment lists. In addition, an allowance for preparation of the second notices should be incorporated into the phase.

- 20__ Data Entry is the time for completing the data entry of the final information for the personal property assessment roll. This may include simply keying in the property owner's name, address and values or it may involve entry of individual property for automated valuation. In either case, time should be allowed to complete the data entry prior to the close of the assessment roll and preferably early enough to allow proofing of the final data.

(6) Hearings

- Informal hearings are set for taxpayers to meet with the assessor and staff prior to the closing of the assessment roll. During these meetings the assessor should attempt to correct any errors found and validate the final values.
- The BOE (Board of Equalization), under 138.010, RSMO, is required to meet the second Monday of July except in a year of general reassessment, when the board may meet anytime after May 31. In first and second class counties (138.090), the BOE meets on the first Monday in June, except in a year of general reassessment, when the board may meet anytime after May 31. In the City of St. Louis, the BOE shall meet on the third Monday in May.

TECHNICAL ASSISTANCE

EXHIBIT 5.11

PHASE CHART

Year : 20

County :

	January	February	March	April	May	June	July	August	September	October	November	December
Administration												
Plan & Budget												
Change Notices												
Assessment Rolls												
Abated Property												
Computer Inventory												
Public Traffic												
Mapping												
Straight Transfers												
Splits & Deletes												
Work Maps												
Inking Updates												
Statistics												
Sales Letters												
Sales Data Entry												
Sales Ratios												
Index												
Land Analysis												
Depreciation												
Real Estate												
New System, D.E.												
Prelim. Calculation												
Final Review												
New Construction												
Final Calculation												
Office Review												
Data Entry												
Personal Property												
Prepare & Mail												
Second Notices												
Process Lists												
Data Entry												
Hearings												
Informal Hearings												
B.O.E. Hearings												
S.T.C. Hearings												

EXHIBIT 5.11 continued, page 2 of 3

PHASE CHART

Year : 2008

County :

	January	February	March	April	May	June	July	August	September	October	November	December
Administration												
Plan & Budget												
Change Notices												
Assessment Rolls												
Abated Property												
Computer Inventory												
Public Traffic												
Mapping												
Straight Transfers												
Splits & Deletes												
Work Maps												
Linking Updates												
Statistics												
Sales Letters												
Sales Data Entry												
Sales Ratios												
Index												
Land Analysis												
Depreciation												
Real Estate												
New System, D.E.												
Prelim. Calculation												
Final Review												
New Construction												
Final Calculation												
Office Review												
Data Entry												
Personal Property												
Prepare & Mail												
Second Notices												
Process Lists												
Data Entry												
Hearings												
Informal Hearings												
B.O.E. Hearings												
S.T.C. Hearings												

EXHIBIT 5.11 continued, page 3 of 3

PHASE CHART

Year : 2009

County :

	January	February	March	April	May	June	July	August	September	October	November	December
Administration												
Plan & Budget												
Change Notices												
Assessment Rolls												
Abated Property												
Computer Inventory												
Public Traffic												
Mapping												
Straight Transfers												
Splits & Deletes												
Work Maps												
Inking Updates												
Statistics												
Sales Letters												
Sales Data Entry												
Sales Ratios												
Index												
Land Analysis												
Depreciation												
Real Estate												
New System, D.E.												
Prelim. Calculation												
Final Review												
New Construction												
Final Calculation												
Office Review												
Data Entry												
Personal Property												
Prepare & Mail												
Second Notices												
Process Lists												
Data Entry												
Hearings												
Informal Hearings												
B.O.E. Hearings												
S.T.C. Hearings												

F. Plan Budget

In order to implement any plan, provisions must be made for funding. The assessment maintenance plan is partially funded under 137.750, RSMO, which provides state funding for up to 50% of costs contained in an approved assessment plan. The funding covers all costs incurred in the implementation of the approved assessment plan with a few exceptions. Those exceptions include:

- Premiums for property and casualty insurance and liability insurance
- Depreciation, interest, building and ground maintenance, fuel and utility costs, and other indirect expenses which can be classified as the overhead expenses of the assessor's office;
- Purchase of motor vehicles.

Other costs and expenses may qualify for reimbursement, but require specific approval in addition to being contained within an assessment maintenance plan and include:

- Salaries and benefits of data processing and legal personnel not directly employed by the assessor;
- Costs and expenses of computer software, hardware and maintenance;
- Costs and expenses of any additional office space made necessary in order to carry out the county's maintenance plan;
- Costs of leased equipment;
- Costs of aerial photography.

Other funding comes from a percentage withheld from all taxes collected, and the county's general revenue. The percentage withheld from tax collections formally was 1% for third and fourth class counties, and one-half of 1% for first and second class counties, and cities not within a county. In 2005, legislation was enacted that provided for additional withholdings from tax collections. In third and fourth class counties, an additional one-quarter of 1%, up to a maximum of \$50,000 is withheld. In first and second class counties, and cities not within a county, an additional one-eighth of 1%, up to a maximum of \$100,000 is withheld. This additional withholding is due to expire on 12/31/2009.

The state funding is limited to appropriations, and is dispersed on the state's fiscal year basis. At present the limit is \$6.00 per parcel, with minimal funding guaranteed at \$3.00 per parcel.

The plan budget consists of two parts, a summary by year and a quarterly plan budget. See *Exhibit 5.12* for the budget summary and *Exhibit 5.13* for a quarterly plan budget. In addition to showing all expected costs the plan budget includes a revenue section for calculating the cash flow. Because the revenue sources are calculated based on a cash flow analysis, the totals for the revenue sources may not equal their respective percentage shares on a calendar year basis. To calculate the cash flow, the following information must be known:

➤ the total budget cost	\$1,285,905.00
➤ the number of parcels	68,444
➤ the cost per parcel	\$18.78
➤ the estimated percentage withholding money	\$500,000.00
➤ the estimated other or miscellaneous funds	\$3,000.00
➤ the state reimbursement amount available for the remainder of the fiscal year	\$110,003.74
➤ the budgeted quarterly total cost	\$1,285,905.00

The cash flow is calculated as follows:

1st	2nd	3rd	4th	Total
-----	-----	-----	-----	-------

Total All Costs	444,720.25	247,314.25	354,006.25	239,864.25	1,285,905.00
General Revenue	0.00	79,030.76	230,349.12	62,861.12	372,241.00
% Withholding	331,716.51	168,283.49	0.00	0.00	500,000.00
State Reimb.	110,003.74	0.00	123,657.13	177,003.13	410,664.00
Other	<u>3,000.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>3,000.00</u>
Total All Revenue	444,720.25	247,314.25	354,006.25	239,864.25	1,285,905.00

In the 1st calendar quarter, the state reimbursement is taken directly from the previous 4th quarter reimbursement request, if funds remain, up to 50% of the expenditures. The balance of funds needed is taken from the other funds, and then the percentage withholding funds. If additional funds are needed, then they would come from the county general revenue.

In the 2nd calendar quarter, the state reimbursement is again taken from the previous reimbursement request, if funds are available. In this case, the county has already received the maximum amount of state reimbursement funds, therefore \$0.00 is available. The withholding funds will also be expended, so General Revenue funds must provide the revenue to cover the approved expenditures.

In the 3rd calendar quarter, the state funds are calculated at 50% of the 2nd quarter costs, as this is the first fiscal quarter and the county is eligible for reimbursement of up to 50% of the expenditures. Again, as the withholding funds have been expended, General Revenue provides the remainder of funding needed to cover the expenditures.

In the 4th calendar quarter, the state funds are estimated at 50% of the 3rd quarter costs; however, a check must be made to ensure that state funding will be 50%. To check the availability of state funds, take the county parcel count times the maximum per parcel reimbursement (presently \$6.00) and subtract state reimbursement received during the previous quarter. If the balance is greater than zero, then the balance, up to 50% of the 3rd calendar quarter's cost, may be used.

➤ $\$68,444 \times 6.00 = \$410,664.00$

➤ $\$410,664.00 - \$123,657.13 = \$287,006.87$

➤ $\$354,006.25 \times 0.50 = \$177,003.13$

In this example, 50% of the 3rd quarter costs is less than the balance of the maximum state funds, so 50% of the 3rd quarter costs is used. The balance of the 4th quarter's cost will come from general revenue because there are no funds available from either the percentage withholding or other funds.

EXHIBIT 5.12

BUDGET SUMMARY

	Approved 2007	Requested 2008	Tentative 2009
Expenditure Summary			
Salaries			
Office Supplies and Expenses			
Training and Mileage			
Other Costs			
Equipment and Computer			
TOTAL			
Sources of Revenue			
County General Revenue			
Tax Collection Withholding			
State Reimbursement			
Other			
TOTAL			
Expenditures by Quarter			
1st Quarter			
2nd Quarter			
3rd Quarter			
4th Quarter			
TOTAL			
Current Parcel Count			
Cost per Parcel			

As required by Chapter 137.750 RSMo, 1994 as amended, certain costs (computers, aerial photography, etc.) require Commission approval before such purchases are made in order to receive state reimbursement. Although allocated building and/or maintenance costs for county-owned property or other non-reimbursable costs may be contained within your plan they will not qualify for state reimbursement. The Commission will process quarterly reimbursement requests promptly when in compliance with the approved plan.

EXHIBIT 5.13

Estimated Quarterly Budget

County	Year				
	Total Expenditures	Jan-Feb-Mar Expenditures	Apr-May-Jun Expenditures	Jul-Aug-Sep Expenditures	Oct-Nov-Dec Expenditures
No.	No.	No.	No.	No.	No.
Salaries					
Assessor					
Deputy					
Chief Appraiser					
Review Appraiser					
Field Personnel					
Real Estate Clerks					
Personal Property Clerks					
Mapping Staff					
Benefits (Soc. Sec.)					
Health, Unemployment					
Work. Comp., Etc.					
Salary Subtotal					
Office Supplies and Expenses					
Appraisal Guides					
Assessment List					
Computer Supplies					
Film/Film Processing					
Mapping Supplies					
Office Supplies					
Photocopying supplies					
Printing Cost					
Stationery					
Other					
Postage					
Telephone					
Office Supply Subtotal					
Training and Mileage					
School/Meetings:					
Assessor Staff					
Mileage:					
Assessor Staff					
Training and Mileage Subtotal					

TECHNICAL ASSISTANCE

EXHIBIT 5.13 continued, page 2 of 2

Estimated Quarterly Budget

County	Year			
	Jan-Feb-Mar	Apr-May-Jun	Jul-Aug-Sep	Oct-Nov-Dec
Other Costs	Total Expenditures	Total Expenditures	Total Expenditures	Total Expenditures
Contracts:				
Appraisal				
Map Maintenance				
Aerial Photography				
Other Expenses				
Other Costs Subtotal				
Equipment and Computer				
Equipment:				
Purchases				
Maintenance				
Computer Expenses				
Hardware Purchases				
Software Purchases				
Maintenance - Hardware				
Maintenance - Software				
Equipment and Computer Subtotal				
Total Cost Summary	Total	Total	Total	Total
Salary				
Office Supplies				
Training and Milenge				
Other Costs				
Equipment and Computer				
Total all Costs				
Sources of Revenue				
Cash Flow Analysis				
County General Revenue				
Tax Collection Withholding				
State Reimbursement				
Other				
Total all Revenue				
Current Parcel Count				
Cost per Parcel				

G. Assessment Maintenance Plan - Sign off

Exhibit 5.14 is a sample sign-off page. This document is used by the assessor and county commission to affirm that the assessment fund has been established and to summarize the financial commitments to the assessment plan.

EXHIBIT 5.14

**2008-2009 Assessment Maintenance Plan
Agreement and Approval**

The parties to this plan, the County Assessor, the County Commission, and the State Tax Commission, agree to its specific terms as well as these general obligations:

The Assessor will assess all taxable property in the county uniformly and at the statutorily required percentage of market value for the respective property. The actions of the assessor and staff will comply with the requirements found in Article X, Section 3 of the state constitution, Chapters 53, 137, 138 and any other pertinent chapter of the Revised Statutes of Missouri.

The County will provide office facilities and the budgetary support, as set out in this agreement, to allow the Assessor and staff to carry out the terms of this agreement and the duties of the Assessor's Office.

The State Tax Commission will provide technical assistance, including regular visits by the field representative, educational training, guidelines and other resources to aid the assessor in the execution of this plan. Further, in consideration for the Assessor supplying assessment services in compliance with the terms and obligations of this plan, the state will provide cost-share reimbursement funds to the extent specified in § 137.750, RSMo.

It is hereby affirmed by the County, that an Assessment Fund has been established, and that the general revenue funds required of this plan will be deposited into the Assessment Fund.

The undersigned approve this plan, submitted this ____ day of _____, 200__.

_____ County, Missouri State Tax Commission of Missouri

_____	Dated	_____	Dated
County Assessor		STC Chairman	
_____	Dated	_____	Dated
Presiding Commissioner		STC Commissioner	
_____	Dated	_____	Dated
Associate Commissioner		STC Commissioner	
_____	Dated		
Associate Commissioner			

5.4 PUBLIC RELATIONS

In any major program of modernization and revaluation, the assessor should advise the public of the program, its objectives, its need and importance and their part in it. The public perceptions of the assessment function affect public acceptance of the property tax and of a reappraisal program. In addition, the effective and efficient functioning of a reappraisal program is dependent upon the cooperation of the owners and the occupants of property. It is important that the taxpayer have an understanding of the property tax system and the assessment practices involved. Therefore, an effective public relations program should be an intricate part of the assessment system and also the responsibility of every member of the assessment staff.

The property tax, like other taxes, exists so that the public may pay for the services rendered to them by government. Each taxpayer should pay a fair share, and only a fair share, of the cost of supporting the local government and its institutions. Therefore, if all properties are valued using the same standards and approaches, then each property owner will pay their fair share of the cost of local government.

Revaluation systems are designed to permit more accurate and frequent reappraisals, which ensure that tax liabilities are apportioned fairly.

The greater the elapsed time between reappraisals the more dramatic the effects of the reappraisal program are apt to be. These effects are an unavoidable consequence of correcting the errors or updating caused by infrequent reappraisals in the past. The issues of higher taxes can be addressed by focusing responsibility on those who set tax levies. Higher assessments do not cause higher taxes. The public should be made aware that the purpose of a reappraisal program is to distribute fairly the burden of taxation.

Assessors should adopt a well planned, step-by-step program of year-round communications,

employing all communication vehicles--news media, public appearances, personal contacts, correspondence, forms and informational brochures. Each medium is important and each has its place in an effective public relations program.

1. News Media

The news media (newspapers, television, and radio) is an effective means for the assessor to reach a wide range of audiences several times a day. The press is usually vitally concerned with local government and its activities. Therefore, with rare exceptions, reporters are assigned to cover the public offices to pick up the news or developments which would be of interest to the public.

It is important that the assessor's office have good contact and working relations with the local press. One approach is to develop a working acquaintanceship with news people responsible for reporting local government news. As a start, the assessor should advise them of policies, the maintenance program, and of their willingness to cooperate fully at any time in answering questions and giving information to the press. Another step is to prepare news releases in which major points are clearly set forth. Technical terms should be defined in layman's language. It is important that the assessor be prepared for interviews. Rarely will a news release be sufficient; reporters may wish to clarify some point, elaborate on others, or ask entirely new questions. Therefore, it is important that the assessor be able to answer reporter's questions clearly, particularly if the interview is for television or radio.

In addition to pure news, it is sometimes possible to interest journalists in feature stories in which assessment subjects can be discussed in depth. Producers of public affairs programs are generally looking for show topics and one on the assessment process could be very positive. A number of assessing officers have appeared on panel discussions and phone-in programs during which specific questions were answered.

2. Public Appearances

Presentations before service clubs, neighborhood associations, and civic organizations are other effective ways to educate the public. Public appearances before local civic organizations may be particularly successful because attendees are generally the movers and shakers of the community and are in tune with its needs. Assessors may wish to contact such organizations and offer their services as a speaker rather than waiting for an invitation.

For this medium, the assessor's office should have several prepared talks, often with charts and slides. The assessor may wish to bring a supply of informational brochures prepared by the office for distribution to those present at the meeting. The assessor should encourage the use of these presentations to the maximum extent and whenever possible may wish to use other members of his staff.

Some counties have found that, in addition to a prepared lecture, the development of a slide and tape presentation can be very effective. The pictures are excellent for telling the story and for gaining attention; while a tape with a good voice is an appropriate medium to accompany the pictures. It has been found that a point can often be made clearer or more dramatic through the use of graphics.

3. Personal Contacts

Personnel in the assessor's office should be thoroughly familiar with the assessment maintenance program and the ad valorem tax system. Each contact between a member of the public and the assessor or staff is an opportunity to provide information and create a favorable impression. In discussing assessment matters, the staff should be courteous and businesslike at all times and remember that the taxpayer is probably unfamiliar with most assessment terminology.

Typically the public's first contact with the assessor's office is at the counter or by phone. There should be a smile, brevity, and friendliness in all office and telephone contacts.

At the counter, waiting time should be kept to a minimum and it is of the utmost importance that people be taken care of in the appropriate order. Counter contact should be businesslike, with visiting and excess discussion minimized, consistent with the courteous hearing of the taxpayer's story.

There is a growing use of the telephone in business and governmental activities, and more and more care needs to be taken in its use. During the telephone contact, the employee should have the data available, and should expedite the conversation. There are booklets available from the telephone companies which are very helpful in training the staff in the appropriate use of the telephone.

In all forms of personal contact, an appropriate general strategy is as follows:

- A.** Obtain the name of the person(s) with whom one is conversing and the identification of the property in question.
- B.** Allow the person to describe the problem.
- C.** Obtain and record the necessary information. If this information is not immediately available, take steps to obtain it. For example, furnishing forms or planning a visual inspection.
- D.** Express pleasure at having the opportunity to discuss assessment matters with the person and thank him for his assistance.
- E.** Assure the person that the matter will be attended to immediately and that if any errors exist, they will be corrected. If the person is plainly wrong or argumentative, it is better to try to end the conversation politely than to become argumentative.
- F.** When a problem has been corrected, personally notify the taxpayer of the steps taken and the final solution.
- G.** Advise the person of appeal rights and procedures.
- H.** If available, offer to provide the person with any brochures that may help the taxpayer to understand the answers to his questions.

The second type of personal contact is that of field contacts by the assessor or by other representatives of the office. A substantial amount of time is spent gathering appraisal data in the field, interviewing property owners, obtaining information and inspecting a particular property. This contact may be the most important one and probably the primary contact of the majority of the citizens with the assessor's office. Here all the rules of courtesy and sympathetic understanding should be observed. The appraiser should be carefully trained to communicate the reason for the field review, the objective of the maintenance cycle and its impact on taxes.

In order to reduce doubts about the identity of staff members and the purpose of their calls on property owners and generally make members of the public feel more comfortable in their contacts with the representatives of the assessor's office, the assessor should provide staff members with such items as identification badges or cards, business cards, and desk name plates. It is a sound policy to file with the county sheriff's department or police department a list of names, vehicle types, and license numbers for all field personnel. Appearances also are important. Attention should be paid to such things as the dress and grooming of the staff, housekeeping, and conduct of the staff when in public view.

Guidelines for personal conduct should be contained in procedural manuals or employee's handbooks and incorporated into the training program.

4. Correspondence

Correspondence can also be used to create a favorable impression. Inquiry letters should be answered promptly, either by letter, by telephone or by personal visit. The letter should be outlined so that it is well-organized, easily understood, and is as short as possible. Also, letters should be courteous but official, in each case stating the purpose of the letter and the authority for it.

There are many textbooks and publications which explain the fundamentals of good correspondence.

They should be available to and be used by the staff.

5. Informational Brochures

An important form of public communication is through the use of brochures explaining the assessment process, state laws, time frame and dates, and the assessor's policies and program. They may also set out the taxpayer's responsibility insofar as the assessment of property is concerned. These brochures may be made up to correspond to the different facets of property assessment, such as; real property, personal property, mobile homes, business property, etc.

This medium can be distributed at the time the taxpayer has a question at the counter or through correspondence. Brochures are also timely in that they can be distributed whenever a talk is being given to service or other organizations.

The brochure should not be too elaborate, but sketches and some charts are frequently helpful. A folio size of about eight pages has been the most commonly used and has proven to be the most successful because it can be put in a pocket or a purse. They should cover the highlights and answer most frequently asked questions as briefly as possible. Many counties have found them very successful and a most important medium of public information, public education, and public relations.

The adoption of the two year assessment maintenance cycle requires continual efforts in the area of public relations. Therefore, a public information and relations program should play a very important role in the successful completion of the reappraisal system.

5.5 USE OF ELECTRONIC DATA PROCESSING (EDP)

With increasing population, rapid technological advances, inflation and other related changes, the assessor's task of maintaining fair assessments has become more difficult and complicated. Electronic data processing systems are a tool of modern technology that facilitates the assessor's ability to maintain and retrieve the vast amounts of data necessary for the operation of an effective assessment system.

The nature of the system and the essentials of its installation and use must be fully understood if the purchase of such a costly item is to be justified. There are many types of systems and it is essential that the proper type and size be obtained after consideration for the present and future needs of the office.

The primary purpose for EDP is to provide for high speed, accurate, and efficient performance of the following functions: (1) record storage and file maintenance (2) classifying, sorting, and correlating data, (3) computing, and (4) report and document preparation. With this in mind, it must be remembered that computer systems have limitations. They do not think, nor do they perform any process for which they are not programmed. If erroneous information is put into the machine, erroneous information will come out. Another limitation is that the systems require knowledgeable operators who are well-informed, not only as to the operation of the system, but also as to the tasks that the assessor is required to perform.

Management should be able to use the system to its fullest capabilities and not be limited to a few operations because of a lack of knowledge. Even though a system is complex, it is merely a tool to

perform a task that management desires to have performed. The use of computers is only justified if the results and services obtained are greater than those which could be realized by comparable expenditures for alternative methods.

1. **Computer Applications** Because EDP systems have the capability of storing, updating, and retrieving vast amounts of data, the assessor can utilize the computer in a number of assessment-related applications.

- A. **Record Management**

The elements of an effective assessment system require that the assessor store, maintain and be able to retrieve a large amount of information. The bulk of the information required by the assessor is found in ownership files, sales files, and property characteristics files. The information in these files must be gathered, sorted, stored, and updated by the assessor.

A computer system can be a tremendous help in the mass appraisal of property by maintaining a record of this data, by providing that the record be constantly updated, by providing rapid and efficient means of making computations from the data, and by producing hi-speed and efficient printouts summarizing the data in a convenient manner for the assessor. The computer system must be designed so that it is adaptable to the data processing operation. Under a well designed system, all of the information relating to ownership, sales, building and improvement characteristics, use, zoning, replacement cost data, depreciation, and other data can be stored on disk. The information then can be updated online each day thereby allowing the assessor to maintain a current database.

- B. **Valuation Applications**

The objective of computerization is to feed complete and accurate data into a system in a form which can be manipulated and easily retrieved in the desired format. The information to be retrieved will

include specific information about the property along with the calculated values. After the office has been computerized and has established a master property file, an accurate property characteristics file, and the appropriate data relating to construction costs, sale prices, and income/expense data, then the assessor will be in a position to apply the appropriate analytical techniques to appraise the properties within the county.

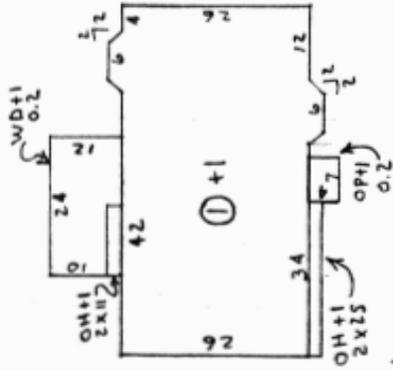
- (1) **Cost Approach** Software is available which allows for the data entry of land and improvement characteristics, looking up base rates, calculating land values and replacement cost new, applying depreciation (or condition) and finalizing values. Cost approach programs are a tremendous asset when a mass update is required. In a mass update, new values can be calculated for tens of thousands of parcels in a matter of hours.

In addition to re-calculating values, the software has the ability to print property record cards or review sheets, which greatly facilitates the parcel by parcel review. *Exhibit 5.15* is an example of a printout showing the estimated property value by the cost approach.

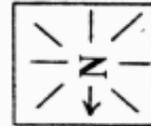
The computation of current replacement cost new less depreciation, or RCNLD is a most important and essential operation if the assessor is to timely perform the task of maintaining current and fair assessed values. The use of computers affords the assessor the opportunity of updating the RCNLD of all structures within the county at one time, thereby allowing the assessor and staff time to concentrate on the valuation aspects, rather than being bogged down with the clerical concerns of manual calculations.

PROPERTY RECORD CARD (PRC)

048-10-05-16-2-08-035.00
Missouri Uniform Parcel Number



B-1
0.3 25x26
0.5 31x26



Property Address: 2421 Lakewood Drive

Property Name: _____

(2) Market Approach

Systems have been developed using multiple regression analysis (MRA) and several have also developed more conventional computerized sales comparison models. These systems have proven to be effective in estimating market values for single family residential properties when sufficient numbers of sales are available. MRA may also be used in the appraisal of multi-family residential properties and urban land.

(3) Income Approach

A number of income approach applications have been computerized. Several of the other techniques used to value income-producing properties are suitable for computerization. For income-producing properties, several income valuation programs are needed if a complete and adequate job of analysis is to be realized.

(4) Statistical Programs

There are also a number of programs which allow the assessor to automate the analysis of market data. These programs can generate sale ratio studies, land value studies, depreciation studies and cost index studies. The use of computer generated statistics allows the assessor to measure the quality and consistency of current values, estimate base values for future use and to test the impact of given value changes. A good program will allow the assessor to ask "What if?" and see the impact almost immediately.

C. Administrative Applications

Computers can be used in countless administrative applications, including the printing of property

records, new-work lists, value-change, audit reports, edit reports with error and warning messages, profile analysis (including histogram and statistical reports), assessment notices, assessment rolls, cross-reference indexes, mailing labels and letters for special mailing, valuation and property-use reports, and the like.

The task of computerizing data into a format that will allow the assessor to obtain accurate and useful results is a formidable undertaking which requires a serious commitment and effort. Considerable amounts of time and effort must be devoted to the task of learning about computers and their capabilities, investigating the cost of purchasing computer hardware (equipment) and software (programs) necessary to complete the task required by the assessor and determining the personnel requirements necessary for the completion of these tasks. The decision to automate and to utilize the capabilities of computer systems in property appraisal is a major one. Therefore, the decision to implement a computerized mass appraisal system must be based upon a thorough investigation into the advantages and disadvantages and the cost-effectiveness of incorporating the use of a computer system into the present assessment operation.

2. Computer Program Minimums

In the fall of 1994, the State Tax Commission adopted a set of computer program minimums. In establishing the computer program minimums, the objective was to ensure a minimum level of program capability and to ease the transition from one vendor's program to another, should that be necessary.

The programming minimums are organized into four divisions:

1.0 General Requirements

2.0 Personal Property

3.0 Real Property

4.0 Appraisal Programs

Within each division, there are one or more categories. The minimum requirements will be implemented at the category level. That is, if a current program does not meet the program minimums for its category, then before any further upgrade/purchase will be eligible for reimbursement, that program will have to be upgraded to meet its minimums. However, it will not require programming in other categories to be added. The following pages list the program minimums.

1.0 General Requirements

1.1 File Layouts and Storage Requirements

File layouts, listing field name, field type, and size will be required for all systems. File layouts will be required for the primary database(s).

Disk storage space needed for data files, application files and for operation of the programs need to be identified. In addition, space requirements for multiple years will need to be identified.

1.2 Hardware Requirements

Reimbursement on hardware costs will be based on the assessor's share. In order to calculate the assessor's share, each county will be required to submit an annual computer inventory form. The assessor's share will be 100% for hardware needed and used exclusively by the assessor. Costs for system components will be allocated. The allocation or assessor's share is calculated in the following manner:

1.2.1 Disk Utilization

For example, on a 600 Mb system where the assessor's files require 150 megabytes (Mb), the operating system utilizes 15 Mb, there are 200 Mb of free or unused space and three offices use the

system (assessor, clerk, and collector) the calculation would be:

$150 \text{ Mb} / 385 \text{ Mb} = 0.39$	Used Space Share
$15 \text{ Mb} / 3 = 5 \text{ Mb}$	Oper. System Share
$200 \text{ Mb} \times 0.39 = 78 \text{ Mb}$	Free Space Share
$(150 \text{ Mb} + 5 \text{ Mb} + 78 \text{ Mb}) = 233 \text{ Mb}$	Assessor's Mb Share
$233 \text{ Mb} / 600 \text{ Mb} = 0.388 \text{ or } 39\%$	Assessor's Share

1.2.2 Other methods may be considered. For consideration of alternate allocation methods, contact the STC.

1.3 Annual Computer Inventory

The annual computer inventory provides for the listing, by office, of disk usage, the number of terminals, screens or workstations and the number of printers on the system.

Each county seeking reimbursement for computer related expenses shall submit an updated annual computer inventory form each year, prior to March 31.

2.0 Personal Property

2.1 Assessment Roll

2.1.1 Required information:

Name

Address

Account number

Tax district(s)

Property quantity

Property description

Property value

Assessed value by subclass

Total assessed value

Property counts (number of units) for:

Cattle: cows/bulls, yearlings, calves

Hogs: sows/boars, barrows/gilts, pigs

Sheep: slaughter lambs, feeder lambs, replacement ewes

Horses, Mares, Geldings, Asses, Jennets and Mules

Poultry/All other livestock

Farm Machinery

Vehicles: (make, model and year); Auto, truck, motorcycle, bus, RV, Boat, Air, other vehicles, historic motor vehicles, historic aircraft, aircraft-kit

Note: If other categories are used for cattle, hogs or sheep, counts for each category shall be available and reported on the livestock breakdown.

2.1.2 Report Requirements

Assessment Roll

Ability to select print order by: name, account number, or tax districts, with subtotal values by subclass per page.

Livestock Breakdown

List each category for cattle, hogs and sheep and their respective count, cost (assessment) per head and the total assessed valuation. Provide a subtotal for cattle, hogs and sheep.

2.1.3 Add, Edit, View Ownership-Property-Values

Ability to enter property into appropriate subclass and tabulate quantity by subclass, and for Form 11/11A.

2.2 Assessment Lists

Print Name, Address, and Taxing District on list

Ability to select print order: by name, tax district, account number, or zip code

Ability to track date received, and generate a second notice for non-returned lists

Ability to flag for penalty and track waiver code

2.3 Property Valuation/Calculation

Ability by user to set up and maintain value tables which allow for look-up and valuation of property

2.4 List and Value past year's property

Ability to list previous year's property and apply current year value

3.0 Real Property

3.1 Assessment Roll

3.1.1 Required information

Name

Address

Acres

Parcel number

Property

Description, Section-Township-Range

Subdivision-Lot-Block

Assessed value by subclass and total assessed value

District information

3.1.2 Report Requirements

Assessment Roll

Ability to select print order by: parcel number, name, account number, or tax districts. Each page to include value subtotals by subclass. On split tax parcels, print only the parent or eligible parcel.

Exempt Property Parcel Report

List the parcel number, ownership, use, status (vac/imp).

Select the order by parcel number or ownership.

Abated Property Report

Print subclass, parcel number, true value in money, % abated, total appraised value abated, ending tax year and statutory authority for abatement. List each parcel and include a summary by authority, number of parcels and total abated value.

Note: This requirement is waived for counties with a system in place or have no abated property to report.

Split Tax Statements Parcel Report

Ability to list the parcel number, ownership, value by subclass, assessment by district for parent parcel (total) and for sub-parcels.

Parcel Count by Map Sheet

List each map number and the number of reimbursable parcels and non-reimbursable parcels

on that map sheet.

Control Samples

This is a three step process, consisting of a list of all parcels, random parcel reports, and lists of selected parcels.

List of Parcels

For each parcel show:

Parcel number (left justify in positions 1-24)

Value of agricultural property (right justify in positions 25-31)

Value of commercial property (right justify in positions 32-38)

Value of residential property (right justify in positions 39-45)

Delimit each record with a carriage return and a line feed (positions 46-47).

Write the report to a PC diskette or CD, or transmit to the STC via a standard electronic protocol. Files to diskette may be compressed if the decompression program is included on the diskette(s) with the data file. Name the file with the first 4 letters of the county name (except Maries - MARS, and Marion - MARN) followed by a two digit year.

Random Parcel Reports

The State Tax Commission will produce three reports, one each for agricultural, commercial, and residential parcels. At each county's request, these may be printed, placed on diskette, or transmitted via modem (parcel number left justified in positions 1-24 followed by a carriage return and a line feed in positions 25-26).

List of Selected Parcels

For each selected parcel, show parcel number, assessed value, mixed use assessments, owner's name, situs address, total acres, property description (either [section, township &

range], or [subdivision, lot & block]).

Input the selected parcels from the random parcel report, either from a computer file or as key-entered--only one method is required.

Produce the lists in the order shown on the STC random parcel reports.

The report should be electronically sent (via diskette or modem) to the STC.

To maintain compatibility with existing systems, the list of all parcels may contain a control number in positions 46-52 (the carriage return and line feed would go in positions 53-54). If used on the list of all parcels, the STC would report that same control number on its random parcel report (in positions 26-32). The list of selected parcels may also include that number.

Taxpayer Change Notice

Ability to generate notice, based on subclass values for increases only, decreases only or for a range of real estate parcels. Notice to include parcel number, assessment by subclass, tax year and instructions on whom to contact, the appeal process and time frame for appeals.

3.1.3 Add, Edit, View Ownership-Property-Value

Ability to input necessary data for assessment roll and aggregate abstract (Form 11/11A).

4.0 Appraisal Programs

4.1 Cost Approach

4.1.1 General Requirements

Ability to enter, edit, view improvements. Program shall look up base costs, calculate values and have override capabilities.

Ability to enter, edit, view land, both market value and agricultural- productive use. Capability to complete a mass land value update.

Ability to complete a mass update of improvement costs by user.

Ability to allocate a single improvement value to multiple subclasses.

4.1.2 Property Record Card/Review Sheet

Allow user to select individual, or a range of properties to be printed.

The design and specific requirements will vary with the cost system in use. The objective of the minimum requirements is to provide all the necessary data needed to list, cost and review real property. The following minimum data requirements are subject to modification at the discretion of the State Tax Commission.

Data required includes:

Parcel number, tax districts, property description.

Owner's name, address, date acquired, consideration, deed book & page land and improvement value, subtotals and assessed value by subclass.

Utilities, roads, topography, zoning, land use code, property type, building permits, construction code.

Data collection by and date, review by and date, information by.

Land quantity, lot size, acreage (deeded/calculated), type/description, land units, unit price, depth, depth factor, influence factor, value agricultural land grades, acres by grade, value by

grade, total agricultural land value.

Type of structures, number of apartments, rooms, bedrooms, stories,
situs address, property name.

Construction data, year built, effective age (year built), remodeled, quality, base rates, extra
feature costs and description, improvement area, depreciation (physical, economic and
functional), improvement subclass(es), and value.

4.1.3 New Construction Report

Ability to list, parcel number, addition/new, subclass, construction complete, notes,
township, city, districts (school, road, fire, city, etc.), quality of construction, valuation
and amount of assessment increase.

4.2 Diagrams or Sketch Vectors

Ability to input improvement footprint(s), and calculate areas necessary for cost system
application.

Print diagrams with appropriate notation and relative placement.

4.3 Market analysis

Sale ratio: list parcel number, sale price, sale date, trended sale price, appraised value, sale
ratio. Allow user to select neighborhood and time frame for sales. Descriptive statistics to
include number of sales, low ratio, high ratio, mean sale ratio, median sale ratio, weighted
mean ratio, coefficient of dispersion (about the median) and PRD (Price Related Differential).

Data to be arrayed based on sale ratio or parcel number order.

Ability to complete mass updates of index and land value rates as well as the selection of the
time adjustment factor.

Ability to print a summary neighborhood sale ratio report which includes the descriptive

statistics for each neighborhood and the time frame of the study.

In addition, it is most helpful to the analysis process if the assessor has the ability to also stratify the sales by various criteria, (age, sale price, size, quality, style or condition assignment). These stratifications of the sales properties may assist the assessor in identifying areas of concern within the mass appraisal process.

Index study: list parcel number, sale price, sale date, trended sale price, land value, manual building value, year built, quality, indicated index and neighborhood. Reports to list data, array indicated indexes, determine number of sales, median indicated index and calculate indicated time adjustment factor. Ability to select a minimum of one year and up to three years (year built) for array.

Depreciation Study: list parcel number, sale price, sale date, trended sale price, land value, improvement RCN, age/year built, current condition and indicated condition. Reports to list data and array by age/year built-condition. Ability to select neighborhood, and quality range for study.

Land study: list parcel number, sale price, sale date, trended sale price, improvement value, residual land value, land units (type/number), adjustment factors (depth, influence etc.), indicated land value, indicated land value/unit, current unit price, neighborhood. Report should allow user to select neighborhood(s), current unit price range, vacant, improved or all sales. Report should array indicated land value/unit and identify median indicated land value/unit.

Prepare an analysis of improved samples in which the land is estimated as a percentage of the selling price, (allocation method) to determine if there is a proper balance between land value and improvement value.

4.4 Agricultural Land

Ability to enter acres by agricultural land grade, calculate values, abstract totals (acres by grade, or value) by county or district.

Ability to edit and view grades by parcel.

5.6 CONTRACTING FOR SERVICES

1. Appraisal

In examining the methods used to carry out a reappraisal program, an assessor may wish to consider employing the services of a professional mass appraisal firm. Two forms of professional assistance may be considered: (1) revaluation by the assessor with the assistance of a mass appraisal firm acting as a consultant; and (2) valuation by a professional mass appraisal firm.

The relative merits of all three methods of carrying out a revaluation program, including the in-house system of revaluation by an assessor and his staff, should be carefully and thoroughly investigated. Each of these methods has its own advantages and disadvantages. Whichever method is adopted, it is essential that the assessor realize that a properly conducted reappraisal program requires the thorough and careful appraisal of all property. For this reason, it is essential that assessors who plan to engage the services of a mass appraisal firm should become familiar with the steps to take and the issues to resolve in order to ensure satisfactory performance on the part of the mass appraisal contractor.

A. Revaluation With a Consultant

If the assessor is capable of handling much of the work of revaluation but has not had the experience or training to develop necessary schedules and tables, the revaluation may be done under the direction of a consultant. Before the consultant is chosen, a thorough investigation of the consultant's qualifications and background should be made. Also, to avoid any misunderstandings,

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a written agreement should be drawn up between the county and the consultant definitely stating what work the county can expect, the fee agreed upon, and what the consultant's charge will be if any additional work will be required.

When conducting an in-house program, technical assistance may be required in the planning and organizational phases of the mass appraisal system. A qualified mass appraisal firm, with its years of expertise, will be able to assist the assessor in designing systems and applying the modern methods and procedures of the appraisal of real property. Technical assistance may also be provided in the areas of mapping and data processing.

The consultant's first responsibility may be to conduct a study of the local building situation, local construction costs, and local real estate sales transactions necessary to develop the valuation and classification schedules required for an effective mass appraisal system. It will also be necessary for the assessor to become acquainted with the use of these schedules in order to be completely familiar with the system. It may also be the consultant's responsibility to make sure that the persons employed to do the field work are trained in measuring and inspecting buildings and in recording the information obtained and also in the supervision of these personnel. The consultant may also assist the assessor in handling the revaluation of all real and personal property of commercial and industrial type properties.

The agreement may also provide that the consultant would appear at public meetings to assist the assessor in explaining how the updated assessments are derived. He should also instruct the local board of equalization in the use of the valuation schedules and techniques developed as they will need to be familiar with the system before the appeals are presented.

As discussed above, the range of duties of a consultant can vary from minimal requirements to virtually complete control over the day-to-day operations of the reappraisal program. It must be remembered, however, that the consultant is employed to assist and advise the assessor. The assessor is still in full charge of the revaluation program, and makes the final decision as to the methods, procedures, and basis of value used and makes sure that all phases of the revaluation program are adequately and competently accomplished.

B. Revaluation By Professional Firm

As many assessors lack staff, or the experience necessary to undertake the task of a general revaluation, it may be desirable to have the work done by a firm specializing in the reappraisal of property. While this method removes much of the burden of work from the assessor, it does not lessen the responsibility to the taxpayers in the county that the revaluation will result in current and fair assessments.

While the revaluation company takes the responsibility for updating cost schedules, doing the field work and computations, the assessor still has the final decision concerning valuations, procedures followed, method of depreciation adopted, and forms used. Throughout the program the assessor acts as appraiser-in-chief, working in full cooperation with the contractor, becoming thoroughly familiar with the procedures and methods, so that after the revaluation is completed the office will be able to maintain the values.

C. Invitation to Bid

The county should seek the bids of reputable and qualified mass appraisal firms who will be able to successfully and effectively complete the revaluation program. But before a contract is offered for bid, the assessor should review the local situation and then develop the county's specifications for revaluation. The assessor should ensure that these specifications clearly state the responsibilities, duties, and liabilities to be incurred by the company who obtains the contract, and the services and equipment to be provided by the county. It should also clearly state that every phase of the revaluation program is subject to approval and review by the assessor and the State Tax Commission. It must be remembered that the firm's bid is a response to the specifications contained within the invitation to bid documents and, therefore, nothing that is not specifically contained therein may be assumed.

County officials should develop a set of "Instructions to Bidders", "Specifications for Proposed

Revaluation”, and a “Bid Proposal Form”. The “Instructions to Bidders” should include the following:

- The location to which sealed bids should be sent.
- The final date and time of day that sealed bids will be accepted.
- A statement concerning examination of the proposed project in which the bidders should be instructed to inspect the proposed project’s site, to determine the circumstances affecting the cost of the proposed reappraisal project, and the staff and facilities necessary for a successful and effective completion of the project in the allotted time.
- A clause regarding surety, stating that each bid should be accompanied with a bid security instrument for not less than a stipulated percentage of the proposed total bid price, and with the name of the appropriate county official to whom the surety instrument should be made payable.
- The date, time, and place that the bids will be opened and read.
- The rights reserved by the county officials in accepting or refusing the bids and the method of distribution of the bonds of unsuccessful bidders.
- A requirement of submission of the qualifications of each bidder to include a brief summary of the company’s previous and current contracts of a similar nature, an organizational chart showing the staffing and lines of authority for the key personnel to be used on this project, the resumes of all key personnel to be assigned to this project, total staff available for this project, other affiliated companies, name of insurance company providing performance bond, etc. The county may wish to include the minimum qualifications of the company and its principle appraisers that it deems acceptable.
- A section delineating responsibility for interpretation of bid specifications.

Fundamentally, the primary and most important part of the bidding process is the “Specifications for the Proposed Revaluation”. These specifications define the requirements expected by the county’s governing body for an effective and efficient completion of the revaluation program. The following are some of the issues that should be covered in the contract specifications.

(1) **Purpose and Valuation Goals of the Reappraisal**

This section should set out the purpose of the reappraisal, the values sought, and the statutory requirements.

(2) **General Scope of Company's Service**

This should be a brief description of the responsibilities of the company in reference to the services to be provided. Reference should be made to the properties inventoried and to the properties excluded from this reappraisal project.

(3) **Approval of Personnel**

The competence of personnel is always a sensitive issue, and the assessor should reserve the right to approve all personnel used by the contractor. This section may include reference to any specification as to work experience required by the county. Requirements for proper identification should also be included.

(4) **Appraisal of Land**

This section would contain the requirements to be used by the company in determining land values.

(5) **Appraisal of Residential, Agricultural and Commercial Properties**

The approaches to value and the appraisal techniques to be employed by the company in valuing the different types of property should be specified.

(6) **Property Record Card (PRC)**

If property record cards are not supplied to the contractor, PRC specifications should be prepared and the assessor should approve all forms developed by the contractor prior to use.

(7) Preparation of Base Cost Schedules/Cost Index

The contractor should investigate and analyze local construction costs, market data, and economic conditions. If the county does not have a cost system in place, the contractor should supply base cost and valuation tables, formulas, and standards necessary for revaluation. All market studies used to establish the base rates or tables should be provided to the county in accordance with the approved assessment maintenance plan.

(8) Use of County Records

The types of county records and data to be provided by the county along with the policies for their use should be included in the specifications.

(9) Final Review

Final field inspections and review of each property should be made by a company's supervisory appraisers upon the completion of value computation.

(10) Work and Delivery Schedules

This section should contain starting and completion dates as well as a list of the items to be turned over to the assessor upon completion of the project.

(11) Hearings and Defense of Values

Requirements as to the company's obligation in notifying the taxpayers of the updated values as well as the holding of hearings to discuss these valuations should be defined. A company should also be required to defend its conclusions of value in the event of appeal.

(12) Public Relations

Throughout the program, the company and its employees should endeavor to promote understanding and amicable relations with the property owners and the public. It should assist and advise the county governing authority and the assessor in the preparation of newspaper articles and other appropriate publicity. The company should, upon request, make available suitable speakers to acquaint groups and gatherings with the methods and values of the project.

(13) Training of Assessment Personnel

One concern with contracting for appraisal services is the subsequent maintenance of the assessment system. Thorough training of the assessor and staff in the procedures used in revaluation can alleviate this problem. The contractor should specify the man-hours and the time frame for the training to be provided.

(14) Insurance and Performance Bonds

The company should carry adequate insurance coverage to indemnify the county from loss resulting from the actions of the company, its employees, and agents arising in the course of the company's performance of this contract. The company should also provide the county with a performance surety bond in an amount equal to 100% of the contract.

(15) Office Space and Equipment

Specifications as to the amount and type of office space to be supplied to the company's staff should be made. The responsibility of supplying the necessary furniture and equipment should be addressed.

(16) Compensation and Progress Reports

Provisions should also be made for the setting up of a payment schedule. A county should consider holding in abeyance a certain percentage of this payment until completion of the project. The company should be required to file a progress report at each billing interval declaring the type or types of work performed the preceding period, and a summary and percentage of total project completion. These progress reports will aid the assessor in determining if the project will be completed on schedule.

(17) Restrictions and Completion Penalties

Restrictions to the subletting and assigning of contracts should be imposed by the county. Should the company fail to meet any of the functions of this agreement or the date of completion, the county should be able to recover an amount of money for the incurred damages as stipulated in this agreement.

D. Contractor Selection

In considering bids, the county officials should consider not only the price for the work as stated in the proposed bid but also the experience and competence of the bidder. Further, consideration should be given to the nature and size of the bidder's organization and the quality of similar revaluations done by that firm.

A firm may be judged to be qualified if it has the resources--personnel, material, and financial--to accomplish the program as specified. The most important question today concerning material resources involves the use of data processing equipment. Financial resources include that the firm must be adequately capitalized to meet the financial obligations of carrying out the revaluation project. The experience of the firm and past business affiliations should be thoroughly investigated.

Qualifications expected for individuals may be judged in terms of education and experience. Frequently, specifications may require a minimum educational requirement of a high school education or its equivalent. The requirements for work experience should vary with the type of task to be performed. Clerical personnel should have adequate training, but extensive experience is not always necessary. Field appraisers should have two to five years of appraisal experience, while project directors should have about five to ten years of experience. Care should be taken to ensure that personnel used or hired have no conflicts of interest. The assessor should always maintain the right to approve all personnel used in the reappraisal program.

E. Contract Preparation

It is the assessor's responsibility to make sure that the contract drawn up with the revaluation company clearly and fully states the duties and responsibilities of the company and the obligations of the county. When a contractor has been selected and a contract executed, it will then be the responsibility of the contractor to complete the work.

The contract is an agreement between the county and the mass appraisal firm stipulating that for an agreed sum of money the mass appraisal firm shall conduct a revaluation program based upon the specifications set down by the county. Therefore, it is important that the "Instructions to Bidders", "Specifications for the Proposed Revaluation", and the "Bid Proposal" be made a part of this contract.

F. Completion of Work

All buildings, structures and improvements must be thoroughly inspected by a trained representative or agent of the revaluation firm. On inspection, new construction should be measured, a perimeter sketch drawn, the appropriate data or details of construction, condition and land data should be recorded. Inspection of existing data should include a review of the physical characteristics, the improvement's quality or grade, the assignment of depreciation and a review of the resulting value.

All revaluation work must be completed in sufficient time for the assessor to review and make necessary changes. Final inspection and review should take into consideration any known or apparent changes in individual properties since the first inspection to ensure that the final appraisal will be as of the date of completion of revaluation.

The appraisal firm must leave with the assessor all schedules for residential, commercial, and industrial property used as a basis for reappraisal values, including details of income approach, if used, and depreciation schedules used.

Complete office and field instructions must be provided so the assessor may be entirely familiar with the work of the revaluation as performed. Depending on the size of the county, two or more copies of all real estate data, land valuation tables and cost data covering commercial and industrial construction should be left with the assessor for future use.

The contractor, following completion of revaluation, should have a qualified member of its staff present at all hearings held by the assessor or board of equalization. The contractor should furnish competent witnesses to defend valuations challenged in the courts for a period of at least one year after the completion of the reappraisal program.

2. Aerial Photography and Mapping

Contracting for the professional services, whether it is for updated aerial photography or map maintenance, should follow the same general steps as found in the following outline.

A. Invitation to Bid

The initial step in the contractual process is the issuance of bid requests. The following check list provides the minimum items to be included in a request for bid.

(1) Instructions to Bidders

- Name, address, and telephone number of contact officer for the project.
- Size of county: square miles, population, and total number of parcels to be mapped.
- Timing: Final bid acceptance date; anticipated contract awarding date; time estimate for fulfillment of mapping program; and any specific scheduling instructions--for example, aerial photography to be done next spring, city maps to be completed first, etc.
- Special instructions to clarify the specifications attached to the bid request, for example: special mapping scales for certain areas; county data to be supplied--assessment records, maps, county clerk's records, etc.; progress report and payment specifications; special work to be done not covered in the technical specifications; training to be performed by the contractor; special instructions concerning the form of the returned bid proposal, number of copies, data requirements, etc.; surety and bonding; bid submission requirements; the rights reserved in accepting or refusing bids; and delineating the responsibility for interpretation of the bid specifications.

(2) Project Specifications

- General scope of the services required
- Bid proposal packages developed during preliminary survey
- Work and delivery schedules

- Insurance and performance bonds
- Compensation and progress reports
- Restrictions and completion penalties

(3) Date to be Submitted by Respective Mapping Firms

- Mapping firm qualifications, staff and equipment to be used for the mapping project, and references.
- Total cost of the project. If subcontractors are to be used, contractors should specify their fees, the work they will perform, and submit their qualifications.
- The cost of extra services not called for in the technical specifications.
- A project schedule showing the time allotted to each phase.

B. Selecting the Contractor

In awarding a contract, the selection of the contractor to provide the professional services required should not be based upon the cost alone. The awarding of the contract should be based on lowest and best bid. Therefore, in considering the proposed bid, consideration should be given to the experience and competence of the bidder, the nature and size of the bidder's organization, and the quality of similar work completed by that firm. A firm may be judged to be qualified if it has the resources--personnel, material, and financial--to successfully complete the program as specified.

C. Monitoring the Mapping Contract

In drafting the contract, it is important that the duties and responsibilities of the company and the obligations of the county or state are explicitly delineated. The final contract is an agreement between the county or state's governing body stipulating that the completion of the mapping program will be based upon the specifications as set forth. Therefore, it is important that the

instructions to bidders, project specifications, and bid proposal be made a part of the contract.

Throughout the mapping program, it is important that the assigned project director monitor the contract to verify that the work is being completed as specified. The monitoring process should include but not be limited to:

- Making necessary data available to the mapper
- Supervising aerial photography to the extent of assuring that correct scales are observed
- Reviewing aerial photography coverage
- Checking quality and completeness of the finished product
- Keeping the project on schedule
- Providing for proper and timely distribution of the finished product

5.7 ASSESSMENT MAPPING

1. Aerial Photography

The first step in the development of the existing mapping program was the acquisition of aerial photography. Aerial photography provides the assessor with a complete pictorial record of all land within the county. This visual record furnishes the assessor with indications as to the type of improvements to the land, their location, the contour and the utilization of the land, and other features relevant to the assessment process.

In addition, the photographic base map facilitated the development of the base cadastral maps by providing evidence as to identifiable property boundary lines. With the aerial photo as a base, the identification of property boundary lines can be aided by the location of walls and fences, hedgerows, streets and highways, rivers and streams, railroad right-of-ways, etc. These indications as to probable property boundaries may be used in the development of the cadastral base map when existing deed descriptions are not complete or are inaccurate.

A. Preliminary Survey

To be an effective tool in an assessment mapping program, aerial photography must be relatively accurate. The development of accurate aerial photography is a specialized field requiring the employment of skilled technicians using precision equipment. To ensure the successful completion of the mapping program, the conditions under which the aerial photography was obtained were thoroughly specified. A preliminary survey was conducted and included the development of county index maps, the development of a basic mapping module, determination of required mapping scales, identification of the types of aerial enlargements, description of the county control network, delineation of flight plans, and development of photographic specifications.

B. County Index Map

A county index map is a smaller scale map on which are depicted the areas to be covered by each base map. The index map delineates each basic map unit, showing the area covered by each 1"=400' map (approximately four sections of land or four square miles, or 2,560 acres), 1"=200' map

(covering 1 section of land or one square mile or 640 acres) and each 1"=100' map (which covers one-quarter section of land or 1/4 square mile, or 160 acres).

Included on the index map are township and range lines, location of cities and towns, primary road and street systems, lakes, rivers, and map identification numbers. The number used to identify each base map should be drafted to properly delineate and display an overall uniform and consistent county map numbering system. *Exhibit 5.16* is an illustration of a county index map.

C. Basic Mapping Module

All assessment maps should conform to certain uniform characteristics. Basic mapping characteristics include a standardized sheet size, map layout, and a uniform map numbering system.

A uniform size for each map-sheet facilitates their handling and storage. Commonly used map-sheet sizes include 20" x 24", 20" x 30", 24" x 36", 30" x 30", and 32" x 36". In Missouri, a 36" x 36" map sheet size was selected. This size allowed the basic modular system to cover the three standard map scales.

Map sheets should have consistent borders and a standardized layout. A standardized map layout should contain a title block, a revision block, a legend, a map key, a North arrow, and keys to adjoining maps.

The numbering system is nothing more than a mechanism whereby maps of subsequently larger scale (maps covering smaller portions of the same area) are sequenced. Using the 1" = 400' as the smallest scale map in the system, it was designated as the basic modular unit in the mapping system.

The basic modules are then assigned a map sheet number. See section 5.7.4 for a detailed description of the Missouri Uniform Map and Parcel Numbering System.

D. Map Scales

The choice of map scales varies with the density of development and with the size of individual land parcels. Small parcels should be shown at a scale sufficient to allow space for entry of parcel dimensions, block and parcel numbers, and other essential data. In most situations, one of three basic map scales serves the needs of counties within the State of Missouri. Recommended scales of

aerial photography are: *Rural* *1" = 400'*
 Semi-Rural *1" = 200'*
 Towns & Cities *1" = 100'*

Exhibits 5.17, 5.18, and 5.19 illustrates aerial photography taken at a scale of 1" = 400'; 1" = 200'; and 1" = 100'. Each larger scale of photography further defines coverage of an area reflected in the previous smaller scale of photography.

EXHIBIT 5.16

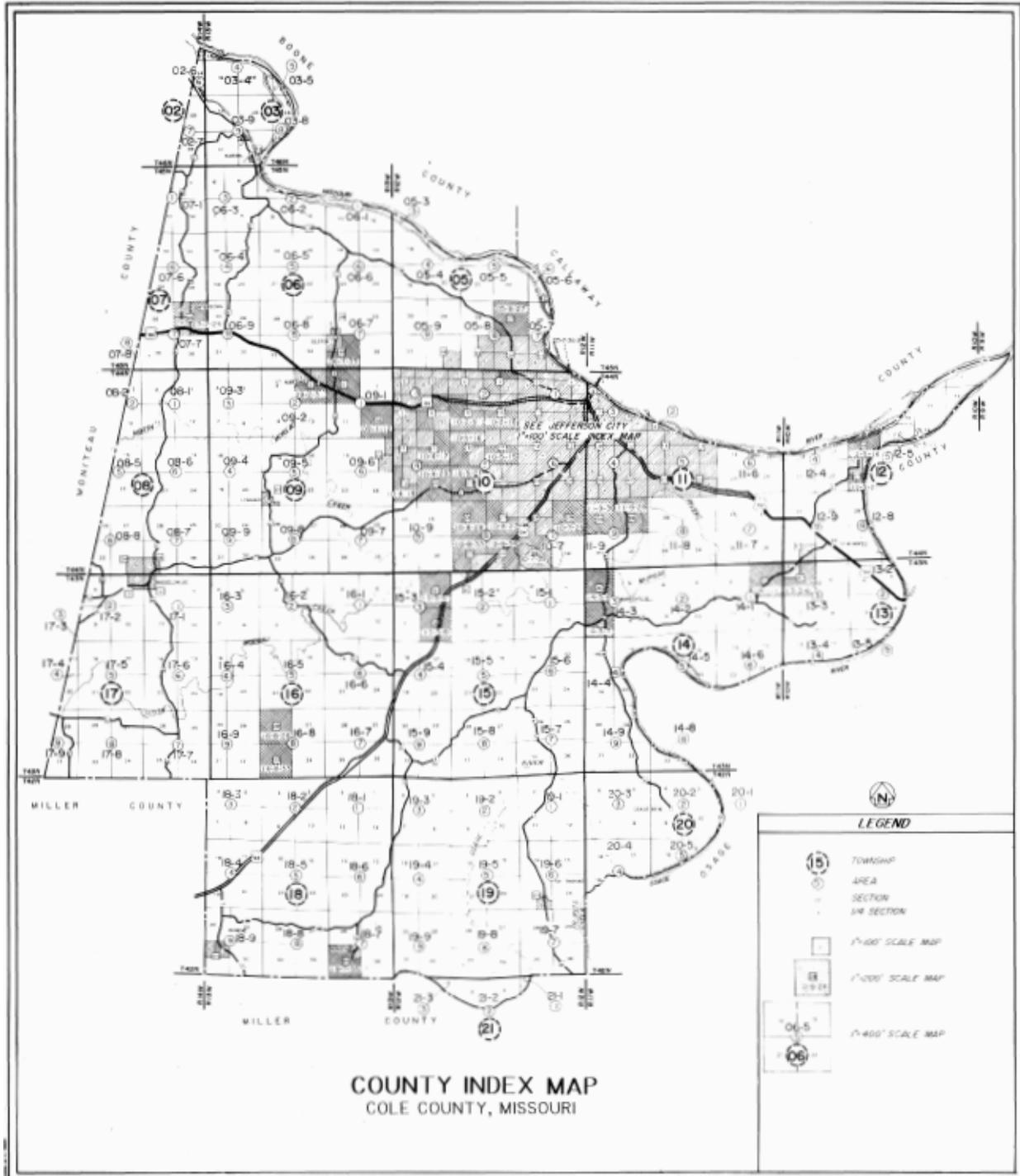


EXHIBIT 5.17
AERIAL PHOTOGRAPHY - PROVIDED BY SURDEX CORP.
MAPPING SCALE 1" = 400'



EXHIBIT 5.18
AERIAL PHOTOGRAPHY - PROVIDED BY SURDEX CORP.
MAPPING SCALE 1" = 200'



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EXHIBIT 5.19
AERIAL PHOTOGRAPHY - PROVIDED BY SURDEX CORP.
MAPPING SCALE 1" = 100'



E. Aerial Enlargement Types

Aerial photography varies in accuracy and cost. The least expensive, a straight photo enlargement is the least accurate. Orthophotography, a highly controlled photogrammetric process resulting in a highly accurate product, is by comparison quite expensive. The determination of the type of photography required in a given area is a function of topographical relief and parcel density.

On an accurate planimetric map, all features are depicted at their correct horizontal position, and the observer would thus have a truly vertical view of every detail shown. This standard is not met by aerial photographic enlargements due to the various sources of distortion or image displacement. Objects pictured on aerial photography may fail to register in their correct horizontal plane positions because of optical deficiencies, tilting of the camera lens-axis at the instant of exposure, or variations in local ground relief. Rectified photo enlargements are based upon a process that reconciles the photography in order to form a single, two-dimensional representation of the surface features. Through the use of predetermined, identifiable, and measurable ground control monuments, the effects of the various sources of distortion or image displacement can be corrected. However, distortion within the photograph is only corrected in those areas relative to the control points, a certain amount of distortion will still exist.

The orthophoto map is a cartographic document prepared by a technique that corrects each point of a photograph for errors introduced by the effects of the various sources of distortion or image displacement. It is the same in appearance as an enlarged aerial photograph, but the orthophoto map has been completely restituted and is as accurate as a planimetric map. The assessor, then, would be able to measure the distances between defined points of interest to determine their horizontal positions on the surface of the earth; an inch on a 100' map corresponds to that identical 100' on the ground, at any point on the photograph.

For counties with hilly terrain or extreme ground relief, orthophotography produces a base on which to compile maps with an acceptable degree of accuracy. In counties with minimal ground relief, good rectified enlargements produce acceptable scaling accuracies.

For the statewide reassessment completed in 1985, the State Tax Commission provided two types of base photography.

➤ **Rectified Photo Enlargements**

Areas with a minimal ground relief, small towns, and rural in nature were mapped through the use of rectified photo enlargements.

➤ **Orthophotography**

Highly developed areas and areas having considerable ground relief were provided with orthophotographic enlargements.

F. County Control Network

Sufficient horizontal and vertical control surveys are important in the establishment of a photogrammetric mapping system. Therefore, in order to develop the accuracy required for rectified and orthophotography and the development of the cadastral base maps, it was necessary to ascertain and delineate on each county map the existing control as established by the U.S. Coast and Geodetic Survey, the U.S. Geological Survey or State Geodetic Control Office. Where existing control data did not exist or was insufficient, a field survey was conducted to establish the necessary horizontal and vertical control.

The location of existing control stations and control points established by new ground surveys and/or aerial triangulation must be of sufficient accuracy and distribution so as to ensure that minimum standards of accuracy for the base cadastral maps may be met.

G. Flight Plan

Prior to the taking of aerial photography, a flight plan must be developed. A flight plan should include identification of flight altitudes and flight patterns. The altitude above average ground elevation for aerial photography shall be such that the negatives will be at the specified scale. A factor of greater than 5X is not recommended for assessment mapping. Photographic enlargements developed at a 1" = 400' scale would have a negative scale of 1" = 2,000'; enlargements developed at 1" = 200' would have a negative scale of 1" = 1,000'; and enlargements developed at 1" = 100' would require a negative scale of 1" = 500'.

A flight line is a line drawn on a map or chart to represent the track of an aircraft necessary to take the desired photos. Therefore, the flight lines would be laid out in such a manner as to achieve each

type of photographic coverage as specified on the county index map. Each flight line is developed to run through the center of each desired photograph at its individual scale and should run continuously across the entire project.

The base photographic maps of an assessment mapping program are most effective when the assessor is able to view the improvements upon each parcel. This requirement limits the amount of time available for the taking of aerial photographs. Aerial photographs for assessment mapping purposes are taken when trees are barren, and when the ground is not obscured by snow, haze, dust, etc. These requirements, therefore, limit the amount of time available during the year in which aerial photography may be conducted. In addition, another important and uncontrollable aspect is the weather. Therefore, in Missouri the taking of aerial photography is limited to a short period in the spring and fall seasons. Contracts for aerial photographic services should be awarded based upon these seasonal limitations.

H. Photographic Specifications

Aerial photographic work is ordinarily done by an outside organization under the terms of a contract. Fundamental responsibility for the content of the contract and its successful completion rests with the county. Thus, it is important that very careful attention be given to the accurate definition of expected products, the complete detailing of all essential steps in the process of map production, and the final completion of all work by a contractor. The specification should cover the following:

(1) General Specifications

General specifications should delineate the scope of the work to be completed. Descriptions of the areas to be photographed, the maps to be produced, and the type of map prints to be supplied should be identified.

(2) Photogrammetry

These specifications might cover ground control accuracy requirements, the qualifications of pilots and photographers, type of aircraft, cameras, and film to be used, the quality of the photography and standards for overlap, sidelap, crabbing, and tilt.

These detailed specifications covering the methods, procedures, and qualifications to successfully complete the aerial photography and base mapping program, including county index maps, mapping standards, mapping scales, types of enlargements, control networks, and flight plans, will be used as the basis in contracting for aerial photography and base mapping services.

2. **Map and Parcel Identification Systems**

An important part of the mapping program was the development and implementation of a map and parcel identification system. A description of various systems used by other counties is included. The development of the Missouri Uniform Parcel and Map Numbering system is included as well. As some counties had already developed mapping systems, which included parcel identification, the use of the uniform parcel numbering system was not mandatory. As a result, there are a number of different systems used within the state.

➤ **Characteristics of a Parcel Numbering System**

Parcel identification numbers, in order to perform their functions, possess a number of desirable characteristics.

➤ **Uniqueness and Permanence**

The uniqueness of the parcel numbering system relates to the assignment of the parcel numbers. A parcel number should be assigned to one and only one parcel.

Permanence is closely related to uniqueness in that a parcel identification number should not be changed unless there is a change in the boundaries or configuration of the parcel.

➤ **Simplicity**

Simplicity is achieved when the number of digits used in the parcel numbering system is minimized, when an identification system is comprised of only numerical symbols, and when the identification numbering system can be easily generated and understood.

➤ **Convenience of Use**

Convenience of use is a function of the descriptive sequence of identifiers and the geographic location information contained therein. If the parcel identification numbering system is based upon geographic location information, the manipulation of property records

based upon these numbers is greatly facilitated. Geographic location information could be based upon the Geographic Coordinate System (Geocodes) or the Federal Rectangular Survey System.

A. Standard Parcel Identification Systems

The most common systems include the Geographic Coordinate System, the U.S. Federal Rectangular Survey System, and the Assessor's Map Book and Page System. A description of these standard parcel identification systems is presented as follows:

(1) Geographic Coordinate Systems

A geographic coordinate-based parcel identification system would be based upon the established system of plain rectangular coordinates which have been established by the United States Coast and Geodetic Survey for defining and starting the positions or locations of points upon the surface of the earth within the State of Missouri. The use of this identification system offers many advantages. Coordinate identification numbers easily satisfy the criteria for uniqueness and permanence in that no two points can occupy the same, identical positions upon the surface of the earth.

The format of the identification number is based on the establishment of coordinate points, called X Y coordinates. The "X" coordinate identifies the easterly or westerly value of the point and the "Y" coordinate identifies the northerly or southerly value of the same point.

The Missouri State Coordinate System is divided into three separate zones, to be officially known as "The East Zone", "The Central Zone", and "The West Zone". The list of counties contained within each zone is set out in Section 60.410, RSMo. The precise identification of the X Y coordinates, adopted by the United States Coast and Geodetic Survey, is contained in Section 60.450, RSMo. Therefore, a geocoding identification number must delineate the zone and the appropriate X Y coordinate points located within that zone.

An example of the format used to identify a parcel using the coordinate system is shown in *Exhibit 5.20*. This sample model is based upon the New York "Coordinate Locator Map Parceling Identification System".

(2) Rectangular Survey System

The rectangular survey parcel identification system is based upon the legal description of the property as described by reference to the subdivisions, lines, or corners as set out in the United States Public Land Survey. Contained within this parcel identification system is the numerical description of the township, section, and quarter section within which the property is contained. Apart from being more complex but slightly more permanent, the government survey-based parcel identification system compares quite closely to the map-based parcel identification systems. This system may also be adapted to identify properties contained within urbanized and highly developed areas. An illustration of a parcel identification number based upon the Rectangular Survey System is illustrated in *Exhibit 5.20*.

(3) **Map Book-Page Identification System**

A map book-page system identifies a parcel by assigning to it a string of codes, each code describing certain elements.

➤ **Map Book Number**

This number identifies the volume or book containing the map page upon which the identified parcel is contained. For example, the total number of map sheets required to delineate property within a county are contained in fifteen books.

➤ **Map Page Number**

The map page number identifies the page upon which the parcel being identified is contained. For example, each of the fifteen books used in the previous example contained twenty-five pages. The map page number should also be set up to identify the modular layout of that particular page.

➤ **Map Block Number**

The map block number is used to delineate a particular portion of the map page where the property is located. The boundaries of a map block may be delineated by street patterns for those maps containing urbanized or highly developed areas or quarter section boundaries for those maps containing rural areas. For example, a map page covering a rural portion of a county containing a section of land may be divided into four blocks with the following block numbers: NE one-quarter equals 01; NW one-quarter equals 02; SW one-quarter equals 03;

SE one-quarter equals 04.

➤ **Parcel Number**

The parcel number is the number used to identify each individual parcel contained within a map block section. For example, the northwest quarter of a section may contain four individual parcels which would be assigned parcel numbers 01, 02, 03, and 04.

An illustration of a map book-page identifier is shown in *Exhibit 5.20*.

EXHIBIT 5.20		PARCEL IDENTIFICATION SYSTEM		IDENTIFIER	
<u>SYSTEM</u>					
Geographic Coordinate System		66868	-	109773	
		Grid		Grid	
		Location		Location	
		E/W		N/S	
Map Book-Page System		10	-	02	03
		Map		Map	
		Book		Block	
		Number		Number	
Rectangular Survey System		13	-	203	010
		Township		Block	
		Code		Number	
Missouri Uniform Map and Parcel Number System		058	-	07	05
		County		Township	Area
				Section	1/4Sec
				Block	Block
				Parcel	Parcel
				Number	Number
				41.00	41.00

3. Cadastral Base Mapping

The concluding step in the assessment mapping program was the drafting of the cadastral maps. The purpose of the cadastral map is to accurately delineate and identify all the parcels of real estate within the county. The preparation of the cadastral map, a planimetric map upon which a draftsman plots or lays out the boundaries of the legal description for each parcel, is recognized as a highly specialized activity requiring skilled personnel and specialized equipment. The development of the cadastral map requires the compilation and coordination of all existing survey and property descriptive data.

The cadastral mapping system should consist of a complete set of detailed property boundary maps for the entire county. The cadastral map or ownership overlay should be recorded on a transparent medium (mylar), see *Exhibit 5.21*, to be superimposed upon the base aerial photo, see *Exhibit 5.22*, to provide for the development of the assessment map or composite map, see *Exhibit 5.23*. The use of the cadastral map on an overlay basis is highly recommended. Through the use of mylar overlays, a county may update base aerial photography without the complete redrafting of the cadastral maps.

In Missouri the development and installation of the cadastral mapping system was performed under the major steps listed and explained below.

A. Planning

The completion of an accurate and effective cadastral mapping program requires careful planning in the areas of map coverage, data to be recorded, and mapping standards.

Each individual cadastral map was drafted at the same scale as its aerial photographic base. Therefore, each county will have a cadastral map for each aerial base photo map at the same scale.

The ownership overlay contains the essential data pertinent to the county assessor. However, it should not be cluttered with excessive data which is of minor significance. A detailed assessment map should contain the following information:

- Boundaries of individual parcels

- Parcel dimensions or areas
- Names and boundaries of subdivision plots including block and lot numbers
- Boundaries of county, township, municipalities, and other taxing districts
- Location and names of streets, highways, alleys, railroads, rivers, lakes, etc.

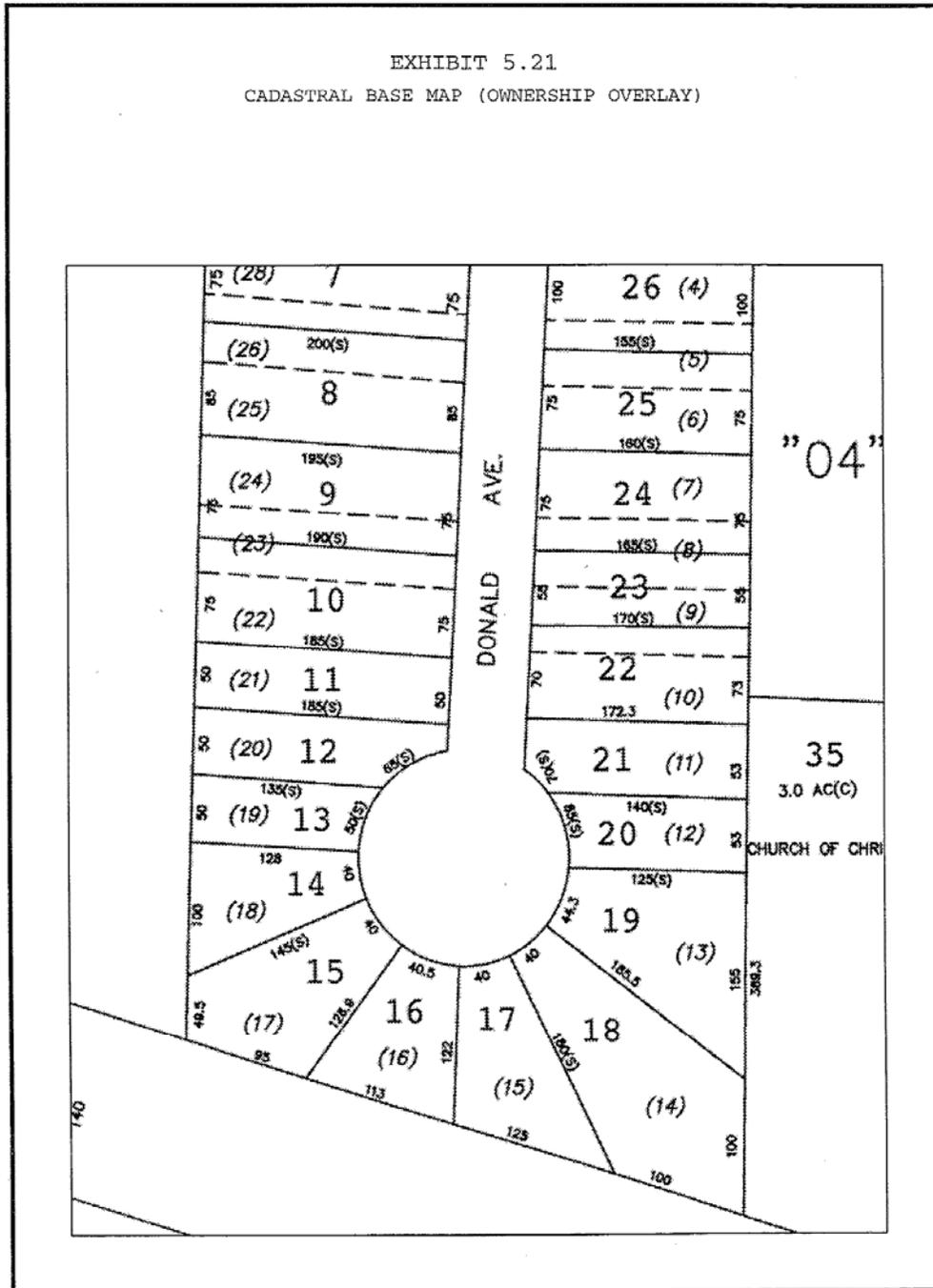
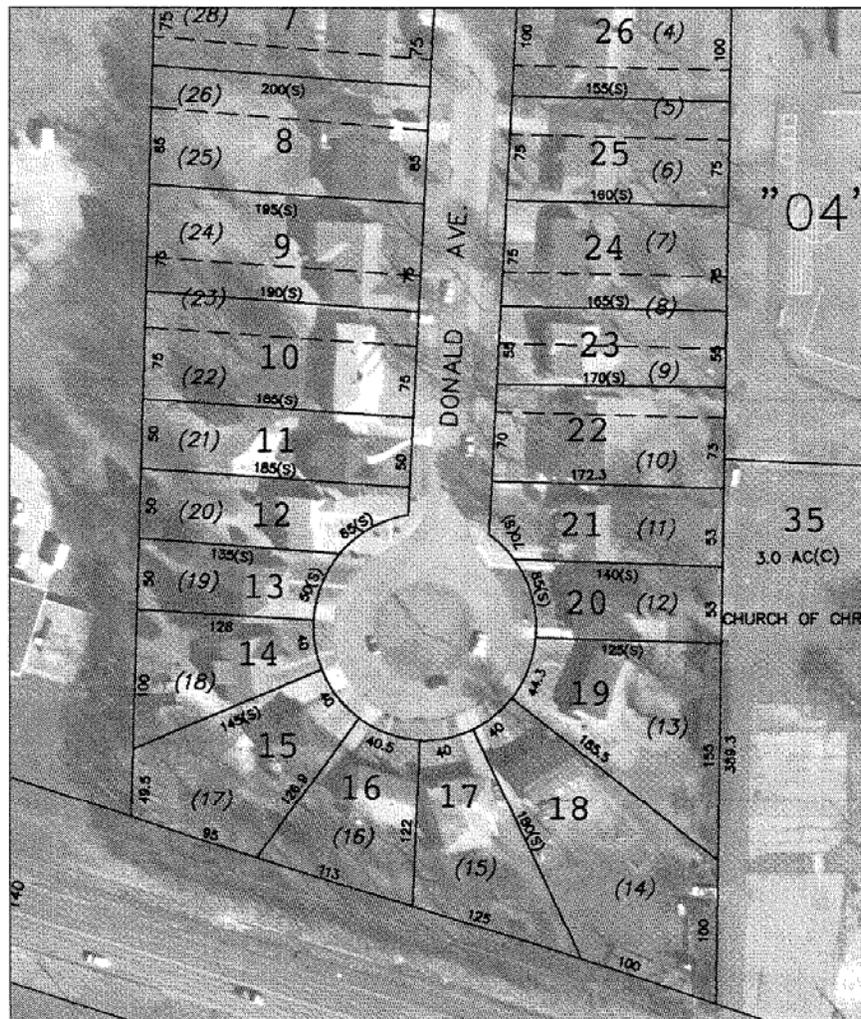


EXHIBIT 5.22
BASE AERIAL PHOTO MAP
PHOTOGRAPHY PROVIDED BY WALKER & ASSOCIATES



EXHIBIT 5.23
ASSESSMENT OWNERSHIP MAP
(COMPOSITE COPY) PHOTOGRAPHY PROVIDED BY WALKER & ASSOCIATES



- Parcel identification number of each respective parcel.
- Basic map information to include title block, page number, map scale and adjoining page number references.

If a cadastral mapping program is to be maintained on an out-of-house basis, a thorough understanding of the procedures to be followed is required of assessment personnel.

B. Data Research

The basic descriptive data for each parcel of real estate was obtained from deeds. In addition, the mapping contractors utilized recorded documents such as subdivision plats, right of way plans, and other maps which clarified the location of property boundaries or planimetric detail.

Deed research involved locating and examining the deeds of all parcels in the county which were not included in a subdivision. When collection of all descriptive data was completed, the data was sorted geographically so a draftsman could coordinate the data in preparation of the layout sheet.

C. Initial Deed Plotting

The next step in the cadastral mapping program consisted of carefully plotting, at the proper scale, all of the survey data relating to the identification of parcel boundaries. This was often a difficult task due to localized inaccuracies of the descriptive data which did not readily fit together. However, the base aerial photography was of great benefit at this stage. From the aerial photograph, it was possible to trace section lines, streams, lakes and rivers, roads and railroads, and many property boundaries. It was important, however, that mapping personnel constantly checked these indicated boundaries against available data for accuracy.

Upon completion of initial deed plotting, all conflicting property descriptions and boundaries were investigated and corrected where possible. The investigation of these conflicting boundaries may have required further deed research, field checks, or meetings with the owners of the parcels containing the conflicting boundaries.

After the initial layout maps were prepared, the mapping personnel then assigned parcel

identification numbers to each individual parcel. *Exhibit 5.24* illustrates the line work and notes which are plotted on the initial deed layout sheet.

D. Final Ownership Maps

When the respective layout sheets were complete and parceled, the final ownership map was inked. The final ownership maps were drafted on dimensionally stable drafting film (mylar) with waterproof ink. Doing so ensures the long life of the map with good reproductive qualities.

Upon completion of the cadastral maps, each map was checked for accuracy. Each map was compared with the sources of descriptive data and the initial layout sheets. All words, figures, numbers, title page references, and dimensions should have been carefully checked for accuracy and completeness.

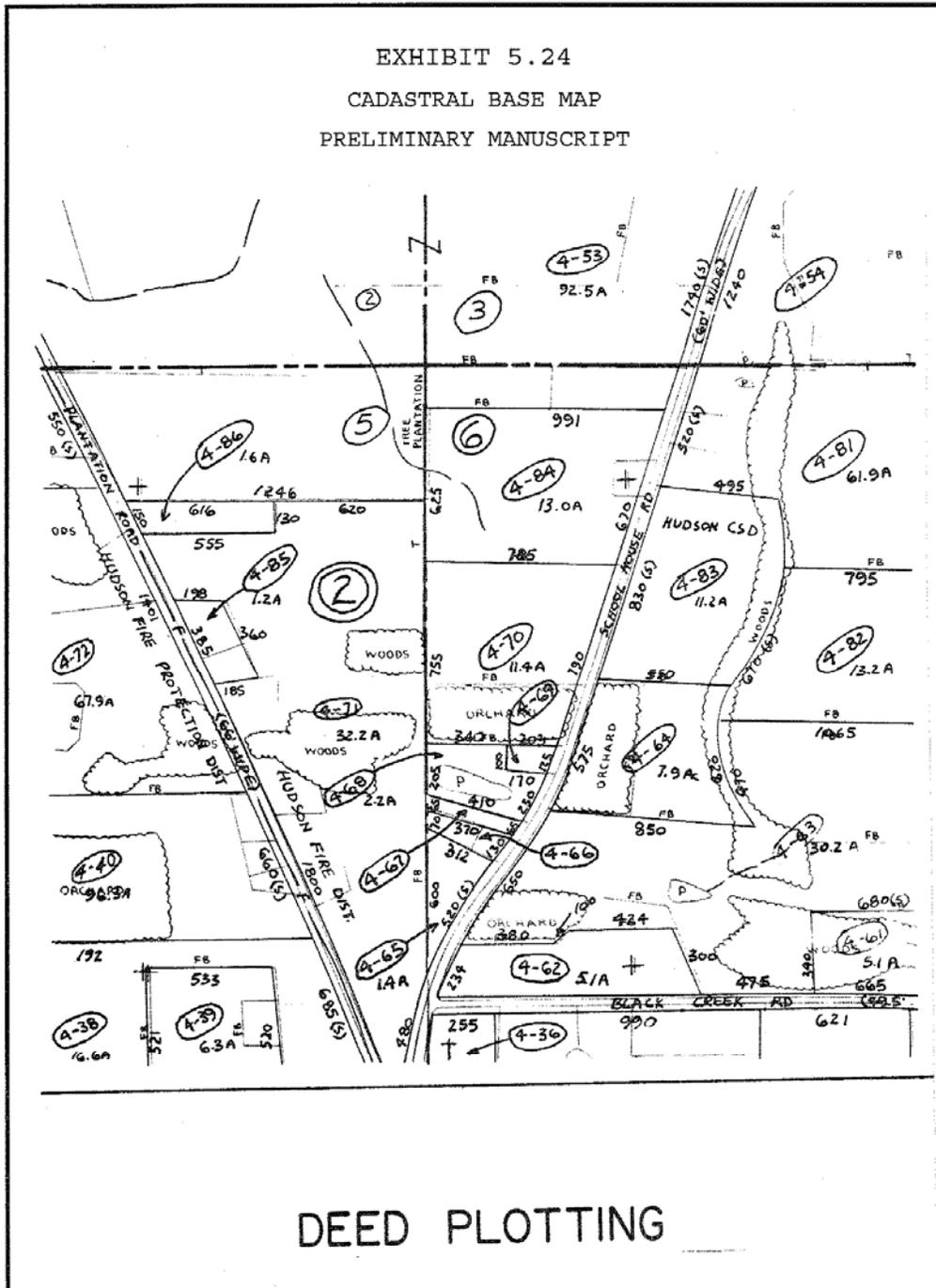
The ownership maps provide the final overlay for the assessment map. By combining the base aerial photo with the ownership overlay, a composite print may be made, thus developing the final assessment map to be used by assessment personnel. The master ownership overlays represents a considerable investment and if damaged, lost, or destroyed would represent a substantial loss. Therefore, they should be stored in a fire-proof drawer cabinet. The masters should be removed only to reproduce additional copies of assessment maps or when they are being brought up-to-date by mapping personnel. *Exhibit 5.25* represents the final drafted base cadastral map for *Exhibit 5.24*.

E. Assessment Map Prints

With the acquiring of aerial photographic base maps and the development of cadastral base maps, the assessor will have an additional official record of assessment data relating to the parcels within the county. In effect, the assessor has acquired a visual representation of the assessment roll. As such, these maps will be subject to constant use by assessment personnel, county officials, real estate brokers and appraisers, taxpayers, and others interested in this information. Therefore, the assessor should arrange for the development of additional prints. Several sets of prints should also be retained for use by assessment personnel as follows:

- Drafting use by mapping personnel
- General office use

- By appraisers for field work in locating, appraising properties and for display of appraisal valuation data and value conclusions



4. Missouri Uniform Map and Parcel Numbering System

A. The Missouri Uniform Parcel Numbering System

The parcel numbering system contains seven sets of numbers, designed to locate the parcel geographically as well as by ownership map sheet. The numbering system identifies the county, township, map area, section, and the individual parcel number. The system is designed to be completely numerical rather than alphabetical to facilitate data processing. A description of the seven sets of numbers is as follows:

1. County Number

Is the same as the number appearing on each individual county contract map. This number will consist of up to three (3) digits.

2. Map Township Number

Is the number of the township in which the parcel is located (townships normally consist of thirty-six (36) sections, 1 thru 36). Each township within the county has been assigned a township number rather than reference the public land survey township and range. The townships shall be numbered sequentially from east to west and west to east in a serpentine manner within each tier so the easternmost township in the most northerly tier would be 01. If a township is less or larger than normal size, it is still numbered in its proper sequence. The township number will consist of up to two (2) digits.

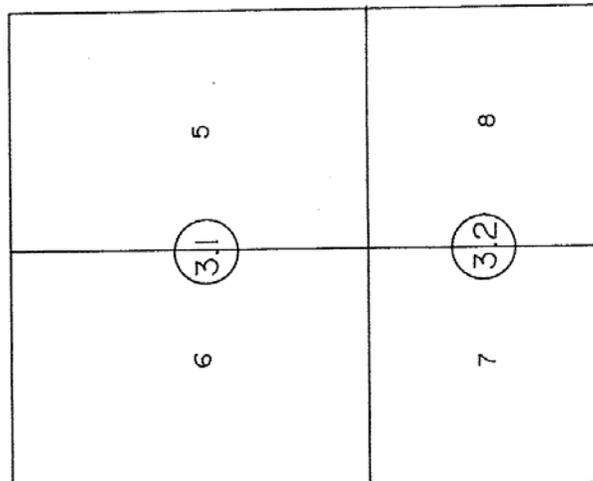
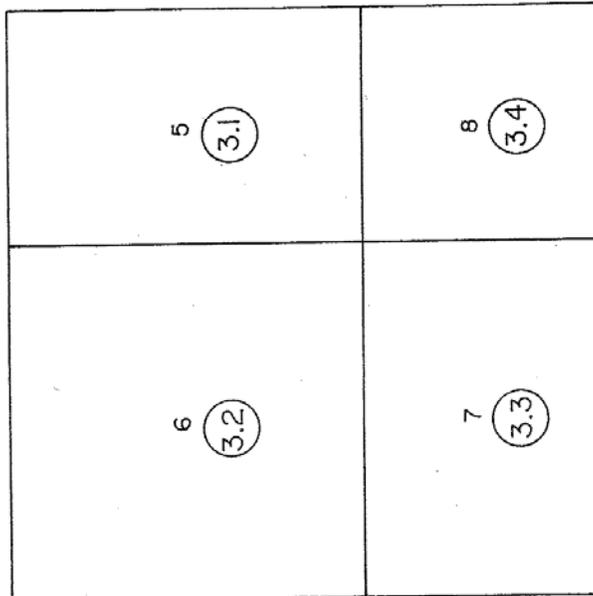
3. Map Area Number

Is a reference to the four (4) section area within each township that would comprise a 1" = 400' scale ownership map sheet. Each township has been broken into four (4) section areas, two sections high (N and S) by two sections wide (E and W). Under normal conditions, there are nine (9) map areas to a township. The areas are numbered sequentially from east to west and west to east in a serpentine manner as are the townships. The northeasterly group of four (4) sections within a normal thirty-six (36) section township would be numbered 01 and the southwesterly would be 09, so that sections 1,2,11,12 comprise map area number 01 and sections 2,3,9,10 comprise map area number 02 etc. If a township is less than normal in size or cut by a county boundary, an area may contain less than four (4) sections. If the township is cut by a county boundary, the area will be assigned the same

number it would normally have in its location within a thirty-six (36) section township. The map area number will typically consist of up to two (2) digits.

In areas where the four sections are too large to be included on a single base map and the area has to be split into more than one or two base maps, then the following will apply. If the two sections in the north portion of an area are separated from the two sections in the south portion, then the number for the top portion becomes 3.1 and the bottom portion is 3.2. If the area is split even further, then the counter clockwise numbering system takes effect. The northeast section will be 3.1, the northwest is 3.2, the southwest is 3.3 and the southeast becomes 3.4. See *Exhibit 5.26* for an example.

EXHIBIT 5.26
MAP AREA LOCATOR NUMBERS
FOR OVERSIZED SECTIONS



CHAPTER:

TECHNICAL ASSISTANCE

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4. Section Number

Is the public land survey number of the section of land in which the parcel is actually located. This will be numbered from 1 to 36. The section number will consist of up to two (2) digits. In areas where land is not described in accordance with the public land survey, the section number has been projected.

5. The Quarter Section or Quarter Quarter Section Number

Is to be the 1/4 section or 1/4 1/4 section in which the parcel is located. These numbers will run in a counter-clockwise manner with the NE quarter being number one (1), the northwest being two (2), the southwest being three (3), and the southeast four (4). In the case of 1" = 50' scale map sheets the northeast quarter of the northeast quarter will be 101, the NW 1/4 of NE 1/4 102, the SW 1/4 of NE 1/4 103 and the SE 1/4 of SE 1/4 would be 104, etc.

6. Map block number

On 1" = 100', each map sheet will be broken down into blocks bounded by geographical features such as roads, streams, railroads etc. Each block will carry a separate map block number and will be numbered sequentially starting in the most northeasterly corner of the map sheet and running serpentine from east to west and west to east. The block number will be a three (3) digit number from 001 up to 999. NOTE: There should be no sub-blocking of the 1" = 50' scale map sheet. Each map at the 1" = 50' scale will constitute a map block.

7. Parcel Number

Is the number assigned to each individual parcel. This number identifies individual parcels within a block, quarter section map sheet or section map sheet. The parcel number can consist of up to three (3) digits.

The following system will be used in establishing the parcel numbering system for splits or sell off, leasehold improvements and condominium owners:

➤ Splits:

When an owner sells a part of the parcel, the split-off will be assigned the original number from which the land was sold plus the addition of a decimal number to identify the split. EXAMPLE: Mr. Jones owns a parcel of land and the tract he owns is identified on the ownership map sheet as parcel 15. He sells part of this tract to Mr. Smith. The parcel

number assigned to Mr. Smith to identify the split will be 15.01. Using this system of identifying splits, up to 99 split-offs can be sold off any individual tract of land, the sequence being from 15.01 thru 15.99.

➤ **Leasehold Improvements:**

The tract of land or lot in which a leasehold improvement is located will be assigned a basic parcel number and the improvements that are owned by other parties and considered to be a leasehold improvement will be assigned the basic parcel number plus the addition of a decimal number to identify the improvement.

➤ **Condominiums:**

The tract of land or lot on which a condominium is located will be assigned a basic parcel number. Each condominium owner will be assigned a decimal parcel number in the same manner as splits or leasehold improvements as stated above.

B. Ownership Map Numbering System

The ownership map numbering system will follow identical with the uniform parcel numbering system:

1. 1" = 400' Scale Map Sheets

The map sheet number for 1" = 400' will be the county number, the township number, and the map area number.

EXAMPLE:

048	-----	10	-----	05
Cole County		Township		Area
County Number		Number		Number
From Contract Map				

Thus three (3) sets of digits shown in the title block of a map sheet would indicate a 1" = 400' scale map.

2. 1" = 200' Scale Map Sheets

The map sheet number for 1" = 200' will be the county number, the township number, the map area number, and the section number that the map sheet actually covers.

EXAMPLE:

048	--	10	--	05	--	16
County		Township		Area		Section
Number		Number		Number		Number

3. 1" = 100' Scale Map Sheets

The map sheet number for 1" = 100' will be the county number, the township number, the map area number, the section number and the quarter section number.

EXAMPLE:

048	--	10	--	05	--	16	--	2
County		Township		Area		Section		Quarter
Number		Number		Number		Number		Section

NOTE: Quarter section #2 indicates the NW quarter of section 35. Thus five (5) sets of digits appearing in the title block would indicate a 1" = 100' scale map sheet.

4. 1" = 50' Scale Map Sheets

The map sheet number for 1" = 50' will be the county number, the township number, the map area number, the section number and the quarter quarter section number.

EXAMPLE: 048-10-05-16-201

048 - Being the number from the county contract map. In this case Cole County

10 - Being the township number.

05 - Being the area number. In this case 07 would be sections 25,26,35 & 36.

16 - Being the section number

201 - Being the quarter section and the quarter quarter section number. In this case the first digit indicating the NW quarter and the last two (2) digits indicating the NE 1/4 of NW 1/4.

Thus five (5) sets of digits appearing in the title block with the last set being three (3) digits instead

of one (1) would indicate a 1" = 50' scale map sheet.

NOTE: The ownership map number will never include the map block number. No map blocking will occur on the 1" = 50" scale map sheets.

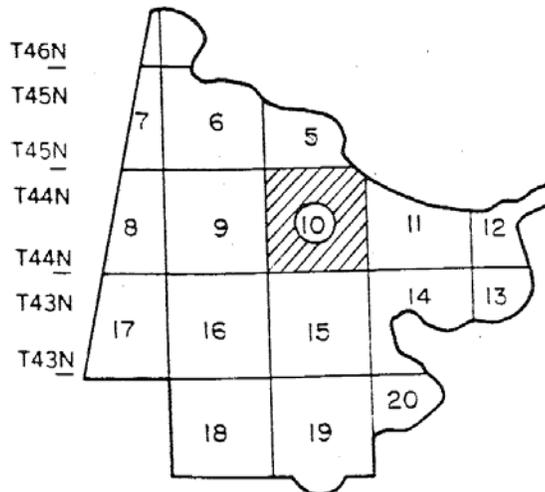
Exhibit 5.27 demonstrates the basic mapping module as defined by the Missouri Uniform Map Numbering System. In the example is the Cole County township locator, which shows how the township numbers have been assigned. In addition, the exhibit shows the map sheet index and a 1/4 section index and how the area numbers are assigned to specific sections.

EXHIBIT 5.27

Missouri Uniform Map Numbering System

TOWNSHIP LOCATOR

| R14W | R13W | R12W | R11W | R10W

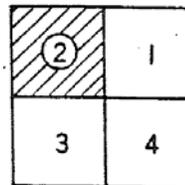


(COLE COUNTY)

MAP SHEET INDEX

6	5	4	3	2	1
3	8	9	2	10	11
7	8	9	10	11	12
18	17	16	15	14	13
4	20	21	5	22	6
19	20	21	22	23	24
30	29	28	27	26	25
9	8	7	25	26	27
31	32	33	34	35	36

1/4 SECTION INDEX

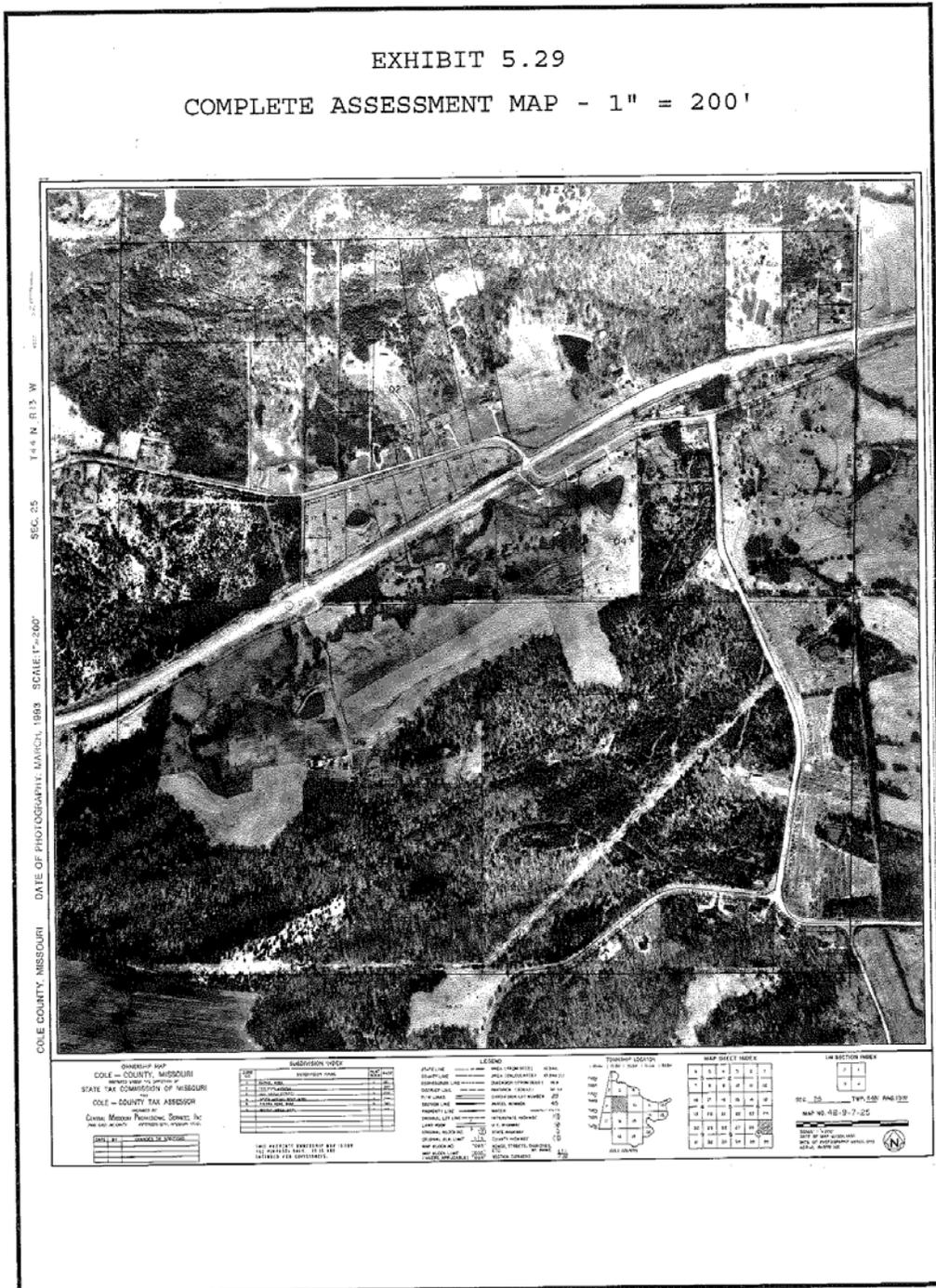


5. Assessment Map Maintenance

Continual maintenance is necessary as this system provides the foundation for all real property files and assessment activities. The required update is usually keyed from information received from the recorder's office in the form of property transfer, new subdivision filings, new surveys, or highway and road surveys. If only a change in ownership is involved, the assessment staff makes the proper entries on the property record card, mapping index cards and the computer for the assessment roll. If a split or combination of existing properties is involved, the clerk forwards the deeds, map index cards and the appropriate property record card(s) to the mapper. After the needed modifications are made to the ownership map, the mapper forwards all data to the appraisers for review and/or allocation of existing values relating to the affected parcels.

Examples, one at each of the three basic map scales, of a complete assessment map with parcel boundary lines overlaid onto the aerial photography are illustrated in *Exhibit 5.28 through 5.30*.

EXHIBIT 5.29
COMPLETE ASSESSMENT MAP - 1" = 200'



Once a mapping system has been installed, it is an absolute necessity to carry on with a maintenance program. Otherwise the initial effort and expense in installing will be negated in a year or two. The assessment process requires the timely collection, assimilation, and distribution of ownership-related data to ensure continuity of all records.

An organized maintenance program can be very routine and easy. It simply involves making ownership and boundary line changes periodically. This can be accomplished on a weekly, monthly, semi-annual or annual basis, whichever is most feasible. To make the changes, you will need a copy of all recorded deeds, wills, plats and surveys which are filed for record in the courthouse. Occasionally you will need to contact certain property owners about changes that occur that are not filed for record.

Each assessor's office can organize its maintenance program according to workload and personnel.

A. Maintenance of Maps and Office Records

The assessor is responsible for the maintenance of the assessment maps and records and often must initiate systems internally that will ensure the constant updating of ownership data.

Procedures, such as the following, have been initiated to ensure the integration of current ownership data into the assessment process:

1. Procedures to gather assessment-related data (recorded documents, building permits, field maps, etc.) from internal and external data sources (state, county, city, etc.).
2. Procedures for maintenance of mapping and office records.
3. Procedures for dissemination of updated assessment information to appropriate users.

A good assessment map system accomplishes the following:

1. Locate all parcels
2. Identifies the owner of record
3. Delineates boundaries
4. Provides unique parcel identifiers
5. Provides an inventory of all real property
6. Provides administrative data
7. Provides a graphic format appropriate for assessment uses
8. Provides for convenient updating and corrections

9. Provides for easy reproduction

The cost of a good mapping system is great, but the benefits of such a system are also substantial. Cost effectiveness is achieved when the maps are prepared and maintained in such a manner as to give them utility for other agencies as well as the assessor's office. Planners, statisticians, demographers, engineers, and surveyors, are all potential users of the assessment map.

B. Map Contract Deliverables

The county received the following material under the original contract for mapping. It can be utilized by the county in a maintenance contract or for in-house map maintenance.

(1) Aerial Film

Scale: 1" = 40,000" and 1" = 12,000"

(2) Aerial Photography (Rural)

- 9" x 9" contact prints at the same scale as the aerial film
- One (1) photo index covering entire county, scale: 1" = 400'
- Screened enlargements of the same scale depicting (4) sections per sheet.

(3) Orthophoto Base Photography

Showing all ground features for use in preparation of the ownership maps at a scale of 1" = 200" or 1" = 100'

- One (1) set stereo contact prints, scale: 1" = 12,000"
- One (1) set original ortho negatives, scale: 1" = 1,000'
- One (1) set photo indexes of areas produced orthographically

(4) Ownership Maps

- Ownership maps scale 1" = 400' normally covering the rural area of the county and which is normally comprised of 4 sections. 1 mylar overlay and 2 ozalid prints.
- Ownership maps, scale 1" = 200', is normally comprised of 1 section. 1 mylar overlay and 2

ozalid prints.

- Ownership maps, scale 1" = 100', is normally comprised of a quarter section. 1 mylar overlay and 2 ozalid prints.
- Ownership maps, scale 1" = 50', which will normally cover the downtown area and is broken on streets, roads or nature boundaries. 1 mylar and 2 ozalid prints.
- One (1) mylar and two (2) ozalid prints each of index maps of entire county depicting all ownership map numbers. One index for the 1" = 400' and 1" = 200' scale maps, and one index for the areas mapped at 1" = 100' scale.

(5) Additional Mapping Aids

- Original plats and surveyor's field notes used in establishing township, range and section lines.
- All right-of-way acquisition surveys or plans for all highways which currently exist in the county.
- One set of topographic maps covering the entire county. (7 1/2' series or 15' series.)
- Railroad and cross country map type utility right-of-way plans.
- One (1) set Work Index Cards with deeds attached filed geographically by map and parcel number and one (1) set of Final Index Cards filed alphabetically.
- Microfilm copy of all Ownership Overlay Mylars and Final Alpha Index Cards indexed and labeled.

C. Map Maintenance Requirements

(1) Source Documents

The mapper will obtain and use the following materials in addition to other material or documents as required in the maintenance and updating of the ownership maps:

- All recorded vesting instruments that sell, transfer or convey ownership of real property or ownerships including wills and trusts during the period of the contract.
- All newly recorded subdivisions or resubdivisions of existing subdivisions and all local surveys.
- All right-of-way plans for new roads, railroads, and changes of existing

right-of-ways for all Federal, State, County and City streets. Final ownership maps must show the right-of-ways of all U.S., State, County and Municipal highways, roads, streets along with the dimensions of such right-of-ways.

- All new right-of-ways for transmission lines (gas or electric) as well as right-of-way dimensions.

(2) **Minimum Map Inclusions**

As a minimum, the final ownership maps will depict only the major detail from the planimetric base with at least the following detail shown:

- Each established parcel and its boundaries
- Township, Range and Section boundaries and numbers
- U.S., State, County, Municipal, etc., Highways, Roads, Streets and Name or Number. This includes determination of and the showing of ROW's and their dimension.
- Township, Range and Section boundaries and numbers
- Political boundaries and subdivisions
- County boundaries
- Municipal boundaries
- Government Lot Numbers
- Subdivision names, block and lot numbers, or other designations
- Canals, rivers, creeks, etc.
- Railroad Right-of-Way
- Major utility lines as shown on planimetric manuscripts
- Churches, schools, cemeteries, airports, government lands, etc. are to be identified on the ownership map by name.

(3) **Drafting**

Final Ownership maps have been drafted on a matte finish, both sides, .004" polyester stabilized base mylar, or equal. The overall sheet will be 36" x 36". The master to be used in printing the blank mylar map sheets will be furnished by the County. The final maps depict the following approximate areas:

Scale : 1" = 400' - 4 sections per map

1" = 200' - 1 section per map

1" = 100' - 1/4 section per map

1" = 50' - 1/16 section per map

All maps shall contain an index showing where it fits into the adjoining map sheets. A suitable legend list shall also be provided on each map.

Unless otherwise noted, all maps have been oriented and constructed with north at the top of each sheet.

All maps will show deed or plat dimensions decimally on all parcels under three acres. All subdivisions or platted lots will, regardless of size, show dimensions. Area on all parcels under ten acres will be shown to the nearest one-tenth (1/10) acre, and all parcels over ten acres to the nearest acre. The acreage will be calculated on every parcel over one acre, either by electronic or polar planimeter or by scaled calculations. If a polar planimeter is utilized for this purpose, the computation should be based on the average of three (3) separate readings.

In those cases where differentials exist in the boundary dimensions as stated in the deed of more than 3%, the boundary will show both dimensions, designating deed dimensions with a small (d), and scale dimensions with a small (s) after the number. Where the differential between deed and scale is less than 3%, only deed dimensions will be shown. It will not be necessary in those cases for a small (d) to be shown. Where differentials exist in area as stated in the deed by a margin greater than the tolerance listed in the table below, then the parcel will show both deed and calculated acreage.

Over 1 acre up to 10 acres	5% difference
Over 10 acres up to 40 acres	4% difference
Over 40 acres up to 160 acres	3% difference
Over 160 acres up to 640 acres	2% difference

Deed acreage, designated by a small (d), will be placed directly under the parcel number and calculated acreage, designated by a small (c), will be under the deed acreage. Where the differentials are less than those listed only deed acreage will be shown and it will not be necessary that it be designated by a small (d). In cases where no acreage is defined in the vesting instrument or in cases where parcels must be split, calculated acreage only will be used and will be designated by a small (c). The differentials in both dimensions and acreage will be shown on the ownership index cards.

Final drafting shall be done in Pelican TN ink or approved equivalent. Drafting shall be accomplished to provide clear and legible lines, symbols and lettering. Uniformity of line weight, symbology, and lettering are required.

Lettering will be accomplished by use of mechanical lettering templates (Leroy or approved equivalent). No hand lettering will be permitted.

D. Drafting Standards

(1) PEN WEIGHT AND TEMPLATE GAUGE FOR 1" = 200', 1" = 100' MAPS

<u>SUBJECT</u>	<u>PEN WEIGHT/TEMPLATE</u>		
Roads and Street Names	1 Pen/120L	Template	
Alleys	00"/80L	“	
Parcel Number	1"/140L	“	
Original Lot Number	00"/120L	“	Slant
Creeks, Streams, Etc.	0"/120L	“	Slant
Rivers, Lakes, Etc.	1"/175L	“	Slant
Deed Dimensions	00"/100L	“	
Scaled Dimensions	00"/100L	“	
Road Dimensions	00"/80L	“	
Deed Acreage	00"/100L	“	
Calculated Acreage	00"/100L	“	
Church, Cemetery, School Names	00"/80L	“	
Ownership Block Number	2"/240L	“	
Original Block Number	2"/200L	“	
Transmission Lines	00"/80L	“	<u>Dashed Line</u>
See Note	0"/120L	“	
Adjoining Map Number	00"/100L	“	Slant
Conflict	0"/120L	“	
State Line	4 Pen		
County Line	4 Pen		

Township and Range Lines	4 Pen		
Section Lines	3 Pen		
Quarter Section Line	1 Pen		
Corporate Limit Line	3 Pen		
Railroad R/W	0 Pen		
Highway R/W	1 Pen		
Property Boundary Lines	1 Pen		
Original Lot Lines	00 Pen		
Water	00 Pen		
Land Hooks	00 Pen		
Transmission Lines	00 Pen		
State Name	2 Pen/200L Template		
County Name	2"/200L	“	
Township and Range Number	1"/140L	“	
Section Number	1"/140L	“	
Corporation Name	1"/140L	“	
Railroad Name	00"/120L	“	Slant
Interstate Highway	1"/140L	“	
U.S. Highway	1"/140L	“	
State Highway	1"/140L	“	
County Highway	1"/140L	“	
Map Number	2"/200L (Minimum)		
District Names	1"/140CL		

(2) PEN WEIGHT AND TEMPLATE GAUGE FOR 1" = 400' MAPS

<u>SUBJECT</u>	<u>PEN WEIGHT/TEMPLATE</u>
State Line	4 Pen
County Line	4 Pen
Township and Range Lines	4 Pen
Section Lines	3 Pen
Corporation Lines	3 Pen
Railroad R/W	0 Pen
Highway R/W	1 Pen
Property Boundary Lines	1 Pen
Original Lot Lines	00 Pen
Water	00 Pen
Land Hooks	00 Pen
S/D Limit	00 Pen
Transmission Lines	00 Pen
State Name	2 Pen/200L Template
County Name	2 Pen/200L Template
Township and Range Number	1 Pen/140L Template
Section Number	1 Pen/140L Template
Corporation Name	1 Pen/140L Template
Railroad Name	00 Pen/80L Template Slant
Interstate Highway	00 Pen/140L Template
U.S. Highway	00 Pen/140L Template
State Highway	00 Pen/140L Template
County Highway	00 Pen/140L Template
Roads/Streets, and Names	1 Penn/120L Template
Alleys	00"/80L Template
Parcel Number	1"/140L Template
Original Lot Number	00"/120L Template Slant
Creeks, Streams Names	0"/120L Template Slant
Rivers, Lakes Names	1"/175L Template Slant
Deed Dimensions	00"/80L Template

Scaled Dimensions	00"/80L Template
Deed Acreage	0"/120L Template
Calculated Acreage	0"/120L Template
Church, Cemetery, School, Etc. Names	0"/100L Template
Transmission Lines	00"/80L Template
Adjacent Map Reference	0"/120L Template
Easement Line	00"
Map Number	2" 200L (Minimum)

For those symbol line weights and lettering sizes not specified above, the mapper will use the same line weights and lettering size as the original mapping in each county done under the original mapping contract. When a stream becomes a property line, the mapper will increase the pen to a #1 pen, but will retain the stream symbol.

E. Ownership Index System

To complete the working system of ownership indexing, the county will maintain two (2) sets of property index cards. One (1) set will be filed alphabetically and one (1) set will be filed geographically (by map and parcel number). Index cards will be maintained for each parcel and a new set of index cards will be prepared for each new parcel. A copy of the deed will be attached to the work index card that is filed geographically by map and parcel number. The cards will contain at least the following information:

- (1) Map number
- (2) Permanent parcel number
- (3) Owner's name and mailing address
- (4) Property address
- (5) Property description (subdivision, block, lot, city, etc.)
- (6) Dimensions and/or acreage (both deed, calculated or scaled) where applicable.
- (7) Section, township and range number.
- (8) Acquisition reference (book, page and date)
- (9) Plat book and page for subdivided property
- (10) Any notes explaining the plotting of or the ownership if different from the vesting instrument or if a field edit is made, information from field edit.

The final ownership index card shall be designed in such a format that would allow the County to add taxing district name or number, property class, and valuation should it desire to do so. The format of the final ownership index card shall be subject to the approval of the County and the State Tax Commission prior to its use. The final ownership index system may be automated provided it meets the criteria as outlined above.

F. Updating Procedures

The mapper will obtain copies of all vesting instruments, newly recorded subdivisions or resubdivisions of existing subdivisions, all local surveys, all new right-of-ways, acquisition plans and changes of right-of-ways for all federal, state, county and city roads and all new right-of-ways of transmission lines, etc. during the updating period of all maintenance activity.

(1) Ownership Maps

➤ Documents

All vesting instruments, documents affecting owners or boundaries, new subdivisions, survey maps, etc. will be sorted by map number and marked as such. Each transfer will be logged on the Maintenance Mapping Register. At this time it will be given a change number. This change number can be used to control each transfer throughout the maintenance period. A Property Change Form (in duplicate should be made and the transfer attached to the mapper's copy. One copy of the Property Change Form will go to the appraiser. Then each transfer or new survey map will be compared with the present ownership map to check the accuracy and completeness of the original mapping. The "card change" procedure will follow this phase of the updating procedure.

➤ Correction & Updating

Splits, sell-offs and/or map corrections will be indicated on a paper copy of the ownership map. The copies of the ownership maps will be furnished by the county. Recolored pencil or ink is suggested for property line changes and dimensions. New parcel or map block numbers should be indicated in green-colored pencil or ink. This color difference on the paper print makes the drafting or inking on the originals much easier and more identifiable. The tax assessor or like county official will record any report or information which indicates an error in owner or owners, or an error in parcel boundaries, on a parcel error change form, for review and required corrections as necessary by

maintenance mapping contractor where applicable. Maps requiring corrections to the original mapping will be done in the same manner as splits or sell-offs.

➤ **Numbering**

Numbering of parcels will be done in accordance with the “Missouri Uniform Parcel Numbering System”. See section 5.7.4.

➤ **Aerial Photo**

Each split, sell-off, or map correction will always be checked against the aerial photo covering the area.

➤ **Field Edit**

In those instances when the property cannot be plotted from the vesting instrument, or conflicts and ambiguities exist, or the transfer is vague, not complete enough to be located, identified or mapped, or where the grantor’s name is not the same as currently mapped, the mapper will make a field edit. The field edit will be attached to the property changed forms. No field edit will be made by phone, except for questions concerning ownership. It is not intended that the mapper go beyond a field interview(s) in an endeavor to interpret ownership or boundary disputes. It is not the mapper’s responsibility to settle or make a legal determination as to the true or proper owner, but rather to attempt to understand and reflect on the assessor’s ownership map the ownership interests that are present.

➤ **Drafting**

Drafting changes on the original will be done in accordance with mapping standards. This will insure uniformity of all maps. At the end of each maintenance period, the name of the mapper and the date through which the maps are updated will be inked on each map.

➤ **Right-of-ways (ROW)**

The addition of new or changed right-of-ways for roads, railroads, utility lines, new streets, etc. will be shown on the ownership maps. The predominate dimensions of each ROW will be shown along with any name and/or highway number.

➤ **Subdivision**

New subdivisions or resubdivisions will be mapped with all contiguous unimproved lots, under a

single ownership, as a single parcel. As future transfers occur, parcels will be created for each contiguous ownership configuration. Parcel numbers will be assigned in a manner consistent with existing numbering and to facilitate field review and record keeping.

➤ **Landhooks**

Lots of any plat separated by a public thoroughfare are not considered to be contiguous. Lots so separated will be mapped and appraised separately regardless of common ownership. Landhooks are to be used in rural areas only where a parcel is split by a railroad or highway right-of-way to denote single ownership. The exception to this will be where parcels are split by interstate highways, lakes or reservoirs.

➤ **Contiguous Parcels**

Contiguously owned parcels in two or more sections shall be mapped as separate parcels. Only contiguously owned parcels in the same section will be mapped as one parcel. However, parcels with a land area of two acres or less in the rural area, not subject to further subdivision, or a lot in a subdivision extending into an adjoining map area, can be included in the map which has the largest land area or facing a street or road, by indicating beyond the intelligence line of the map, lines showing the remaining part of the parcels. Dimensions will be shown. The portion of the parcel extended across the intelligence line will be shown by solid lines. The section or intelligence line will be dashed thru the parcel. The map that carries the remaining portion of the parcel will be referenced in the margin area. The map that has the land area not assigned the parcel number will have a reference note to which map and block the land area is parceled. In summary, any land area will be shown by solid lines to show that it is considered and included in another map and the maps will be cross-referenced and all land area in every map must be accounted for.

➤ **Encroachments (Conflicts)**

In plotting property where a field edit and deed have determined an encroachment actually exists, the area of encroachment will be visibly marked by the use of dashed lines on the map, and labeled as a "CONFLICT".

➤ **Supplemental Maps (Inserts)**

When it has been determined that an area needs to be enlarged (from 1" = 400' to 1" = 200' or 1" = 100') the area enlarged on the original ownership map will show the new map number for the land area enlarged. The map or maps created will then carry the map and uniform parcel numbers as

determined by the □ Missouri Uniform Map Numbering and Parcel Numbering System □. The area enlarged and the parcel numbers will be deleted and the index card removed from the current file and placed in an inactive file. New property boundary lines will be created along with new index cards with all required information and new parcel numbers for the land area enlarged.

➤ **Combinations**

The combining of parcels or the eliminating of parcel numbers should be handled very carefully in order that all parcels have a number unique to themselves. The index cards of the deleted parcel should be pulled and placed in the inactive file.

➤ **Placement of Drafted Information**

1. Names of streets, or street numbers and roads, should be placed in the center of the travel path, where possible.
2. Original subdivision (S/D) lot numbers should be placed in the rear of the lots in a slanted position.
3. Original S/D block numbers should be centered in the block with the printing being dashed and inside a dashed circle.
4. Parcel numbers should be placed in the middle of the parcel on platted parcels and in the northeast corner on unplatted parcels.
5. Block numbers should be placed in the center of the parcel with quotation marks included, with blocking limits indicated where applicable.
6. Small block numbers and ticking will be placed at block limit breaks where applicable.
7. Dimensions should be near the center portion of a property line.
8. Acreage should be placed directly under the parcel number and if both deed and calculated acreage are utilized, the deed acreage (d) should be listed first with the calculated acreage (c) being listed below the deed acreage.
9. All highway symbols should straddle the travel path, where possible.
10. Government property, churches, schools and cemetery names should be placed nearer the middle of the parcels.
11. Insert information should reference information and where to be found in the center of the unmapped area.

➤ **Photo Number**

When a mapper has created an additional map, the flight line and the exposure number of the aerial photograph that covers that map should be inked in the legend area below the subsheet index indicator.

(2) **Property Index Cards**

➤ **Property Descriptions**

A property description is based on the description from the vesting instrument, is in an abbreviated form and eliminates information not essential to the plotting of the parcel. A property description does not require a verbatim copy of the vesting instrument description if the description is excessively long, but rather the description should describe the subject property as it found on the ownership map.

Land that can be described in the conventional manner, such as quarter-quarter section, half section, full section, etc. will be described this way.

The section, township and range will be shown. If the property is located within an urban area, the name of the city should be shown, where applicable.

The property description for subdivided property will be in the following manner: lot, block, subdivision, city or town, where applicable. There is no need to follow this description by a section, township and range, if the property is located within an urban area. If the subdivided property is located in the rural area, the description should be lot, block, subdivision, section, township and range. When a verbatim description in the vesting instrument cannot be used and a parcel must be described by metes and bounds, the following procedures should be utilized in writing the metes and bounds property description: The description should start with an existing photo-visible point on the ownership map, such as 1/4 1/4 section corner, an intersection of two (2) roads, an intersection of a road right-of-way and a section line etc. Once the point has been determined, then the distance and direction to a point of beginning (POB) of the parcel will be stated. The POB of the parcels will be used to describe the actual boundaries of the parcel. From the point of beginning the description continues around the boundaries of the parcel giving the direction and distances until the description closes back to the point of beginning. The deed dimensions and, if required, the scale dimensions or deed acreage and/or calculated acreage will be stated in the description. If the parcel is located

within an incorporated area, the name of the city, town or community should be stated unless a space for this is provided on the index card.

➤ **Ownership**

Full names of all parties in tenancy will be shown. Full interest of all owners will be determined by vesting instrument and/or field edit. If tenants own a fractional interest, such interest will be indicated by each name on the Property Index Cards. This also includes estate property or trust.

➤ **Property Address**

Where the property is located on a street, road or boulevard, the property address will list the house number, name or number of the road, street, or boulevard and city, town or community. If located in the rural area not having an address similar to that in the urban or suburban area above, show the following as an address:

1. Property adjoining Federal, State or County Highway, the name or number of the highway will be acceptable as an address. If the property is located on a creek, river, railroad or any other identifiable point, the property address will show such identifiable point.
2. Property not located on or adjacent to the above: property not located on road, street, highway, creek, river or other identifiable point, but can be identified by property located north, south, etc., of a highway, river, creek and railroad will show the address that the property lies north or south or so forth of such physical feature. The location point shown in the address should be located within the section in which the parcel is located.
3. Parcels which are split by the above will reflect north and south, etc., of highway 164 and/or creeks, railroads, rivers and streets.
4. Parcels of land less than 1/4 1/4 section which cannot be given a property address in the above manner should show in the property address section of the Property Index Card the 1/4 1/4 section in which the parcel is located.

(3) Storage

➤ **Inactive File**

Property index cards and prints of ownership maps that have been changed due to splits, sell-offs or corrections of errors will be marked inactive. They will be filed by the mapper in storage provided by the county in a manner which allows for ready reference.

➤ **Storage of Mapping Material**

All materials used in the updating and the maintenance of ownership maps; such as, Property Change Forms with deeds, subdivision plats and surveys, ROW plans, Field Edit Forms, etc., will be filed by the mapper in a manner which allows for ready reference.

5.8 MARKET STUDIES

There are four basic market studies conducted in the assessor's office. Each study has a distinct objective, although they all rely on the same basic information. The key to successful market analysis is the collection, verification and use of good sale data.

How do you verify that a sale is a good "arms-length" transaction? By learning all you can about the conditions and situations involved in a particular sale. Consider, does the sale meet the key elements of the market value definition? *Were both the buyer and seller willing, and neither at an unfair advantage over the other or under pressure to act? Was the subject property exposed to the market for a reasonable amount of time? Were both the buyer and seller knowledgeable of the property, its use and its potential uses?* If so, then the sale can be considered a good sale and is suitable for use in the market studies.

By knowing the parties involved and verifying the terms, conditions and particulars of a given sale the appraiser is prepared to analyze the sale and to draw from it reasonable conclusions about the market. See *Exhibit 5.31* for samples of the basic market study forms.

EXHIBIT 5.31 page 2 of 5

Superior County, Missouri
Land Value Analysis

Abstraction Method

FRFT land; Neighborhood 17; All Prices; All sizes; All UPNs; Sale years 2004-2006

Uniform Parcel Number	Rec. Num.	Sale Price	Sale Date	Trndd Sale Price	Frontg Depth	Impr. Value	Ind. Land Value	Factors Dpth Infl	EFF. Units	Ind. Unit Value	Cmnt Unit Price	Nbhd
22-0.3-07-03-01-010.060	353	176000	6/2006	179,080	75	135	152184	26896	1.00	1.00	250	17
22-0.4-19-01-29-010.000	125	72500	4/2004	78,481	66	108	56825	21656	0.93	1.00	250	17
22-0.4-19-01-40-011.001	196	141500	8/2005	147,514	83	141	109097	38416	1.01	1.00	250	17
					37	126			0.98	1.00		
22-0.4-19-01-40-110.010	360	141500	8/2005	147,514	83	140	109097	38416	1.01	1.00	250	17
					37	126			0.98	1.00		
22-0.4-19-02-03-002.000	118	165000	1/2004	179,850	144	132	134939	44911	0.99	0.90	250	17
22-0.4-19-02-03-080.000	281	36000	1/2006	88,580	82	122	50281	38299	0.96	0.65	250	17
					82	131			0.99	0.65		
22-0.4-19-02-04-010.000	143	120000	7/2004	129,000	120	105	98788	30212	0.91	0.90	250	17
22-0.4-19-02-04-020.000	314	116000	5/2006	118,320	75	120	123767	-5447	0.96	1.00	250	17
22-0.4-19-02-04-090.000	330	127500	9/2005	132,600	75	120	81822	50778	0.96	1.00	250	17
22-0.4-19-02-05-020.120	347	156000	4/2005	164,190	93	102	130380	33810	0.91	1.00	250	17
22-0.4-19-02-05-020.480	357	205000	9/2005	213,200	99	102	138731	74469	1.00	1.00	250	17
22-0.4-19-02-06-090.000	328	125000	4/2006	127,813	79	128	96971	30841	1.02	1.00	250	17
22-0.4-19-02-11-008.000	117	100000	1/2004	109,000	75	81	84495	24505	0.80	1.00	250	17
22-0.4-19-02-11-030.000	336	135000	6/2006	137,363	139	122	89025	48337	0.96	0.90	250	17
22-0.4-19-02-11-080.000	327	125000	4/2005	131,563	75	118	84495	47067	0.80	1.00	250	17
22-0.4-19-02-18-010.000	352	175000	4/2005	184,188	200	96	115745	68442	0.90	1.00	250	17
22-0.4-19-02-18-020.000	356	196500	5/2006	200,430	200	111	149661	50769	0.93	1.00	250	17
22-0.4-19-03-02-015.000	153	160000	9/2004	171,200	99	165	147553	23647	1.05	1.00	250	17
22-0.4-19-03-02-140.000	348	160000	6/2006	162,800	94	141	133844	28956	1.01	1.00	250	17
22-0.4-19-03-03-050.000	364	164000	5/2006	167,280	123	134	143661	23619	1.00	0.85	250	17
					42	130			0.99	0.35		
22-0.4-19-03-03-130.000	363	167000	6/2006	169,923	96	147	141889	28033	1.02	1.00	250	17
22-0.4-19-03-04-050.000	195	146400	10/2005	151,890	90	135	132429	19461	1.00	1.00	250	17
22-0.4-19-03-04-050.000	341	140000	10/2005	145,250	90	135	132429	12821	1.00	1.00	250	17
22-0.4-19-04-03-020.000	188	161500	7/2005	168,768	134	131	162821	5946	0.99	1.00	250	17
22-0.4-19-04-03-020.000	349	161500	7/2005	168,768	134	131	162821	5946	0.99	1.00	250	17
22-0.4-19-04-06-010.000	355	195000	5/2005	204,750	111	120	145749	59001	0.96	1.00	250	17
22-0.9-30-02-02-017.000	359	287000	3/2006	294,175	96	311	274258	19917	1.02	1.13	250	17
22-0.9-30-04-01-040.290	346	155000	6/2005	162,363	130	90	123366	38996	0.85	1.00	250	17
22-0.9-30-04-01-040.310	350	154900	5/2005	173,145	130	90	111865	61280	0.85	1.00	250	17

EXHIBIT 5.31 page 3 of 5

Superior County, Missouri
Land Value Analysis
Land / Sale Price Method, Using 20%
FRFT land; Neighborhood 17; All Prices; All sizes; All UPNs; Sale years 2004-2006

Uniform Parcel Number	Rec. Num.	Sale Price	Sale Date	Trndd Sale Price	Frontg	Dpth	Impr. Value	Ind. Value	Factors Dpth	Infl	Eff. Units	Ind. Unit Value	Crrnt Unit Price	Nbhd
22-0.4-19-03-01-010.060	353	176000	6/2006	179080	75	135	152184	35816	1.00	1.00	75	478	250	17
22-0.4-19-01-29-010.000	125	72500	4/2004	78481	66	108	56825	15696	0.93	1.00	61	256	250	17
22-0.4-19-01-40-011.001	196	141500	8/2005	147514	83	141	109097	29502	1.01	1.00	120	246	250	17
					37	126			0.98	1.00				
22-0.4-19-01-40-110.010	360	141500	8/2005	147514	83	140	109097	29502	1.01	1.00	120	246	250	17
					37	126			0.98	1.00				
22-0.4-19-02-03-002.000	118	165000	1/2004	179850	144	132	134939	35970	0.99	0.90	128	280	250	17
22-0.4-19-02-03-080.000	281	86000	1/2006	88580	82	122	50281	17716	0.96	0.65	104	170	250	17
					82	131			0.99	0.65				
22-0.4-19-02-04-010.000	143	120000	7/2004	129000	120	105	98788	25800	0.91	0.90	98	263	250	17
22-0.4-19-02-04-020.000	314	116000	5/2006	118320	75	120	123767	23664	0.96	1.00	72	329	250	17
22-0.4-19-02-04-090.000	330	127500	9/2005	132600	75	120	81822	26520	0.96	1.00	72	368	250	17
22-0.4-19-02-05-020.120	347	156000	4/2005	164190	93	102	130380	32838	0.91	1.00	85	388	250	17
22-0.4-19-02-05-020.480	357	205000	9/2005	213200	99	102	138731	42640	1.00	1.00	99	431	250	17
22-0.4-19-02-06-090.000	328	125000	4/2006	127813	79	128	96971	25562	1.02	1.00	81	317	250	17
22-0.4-19-02-11-008.000	117	100000	1/2004	109000	75	81	84495	21800	0.80	1.00	60	363	250	17
22-0.4-19-02-11-030.000	336	135000	6/2006	137363	139	122	89025	27472	0.96	0.90	120	229	250	17
22-0.4-19-02-11-080.000	327	125000	4/2005	131563	75	118	84495	26312	0.80	1.00	60	439	250	17
22-0.4-19-02-18-010.000	352	175000	4/2005	184188	200	96	115745	36837	0.90	1.00	180	205	250	17
22-0.4-19-02-18-020.000	356	196500	5/2006	200430	200	111	149661	40086	0.93	1.00	186	216	250	17
22-0.4-19-03-02-015.000	153	160000	9/2004	171200	99	165	147553	34240	1.05	1.00	104	329	250	17
22-0.4-19-03-02-140.000	348	160000	6/2006	162800	94	141	133844	32560	1.01	1.00	95	343	250	17
22-0.4-19-03-03-050.000	364	164000	5/2006	167280	123	134	143661	33456	1.00	0.85	119	281	250	17
					42	130			0.99	0.35				
22-0.4-19-03-03-130.000	363	167000	6/2006	169923	96	147	141889	33984	1.02	1.00	98	347	250	17
22-0.4-19-03-04-050.000	195	146400	10/2005	151890	90	135	132429	30378	1.00	1.00	90	338	250	17
22-0.4-19-03-04-050.000	341	140000	10/2005	145250	90	135	132429	29050	1.00	1.00	90	323	250	17
22-0.4-19-04-03-020.000	188	161500	7/2005	168768	134	131	162821	33753	0.99	1.00	133	254	250	17
22-0.4-19-04-03-020.000	349	161500	7/2005	168768	134	131	162821	33753	0.99	1.00	133	254	250	17
22-0.4-19-04-06-010.000	355	195000	5/2005	204750	111	120	145749	40950	0.96	1.00	107	384	250	17
22-0.9-30-02-02-017.000	359	287000	3/2006	294175	96	311	274258	58835	1.02	1.13	111	532	250	17
22-0.9-30-04-01-040.290	346	155000	6/2005	162363	130	90	123366	32472	0.85	1.00	110	294	250	17
22-0.9-30-04-01-040.310	350	164900	5/2005	173145	130	90	111865	34629	0.85	1.00	110	313	250	17

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Superior County, Missouri
Index Calculations

For Years 2003 2004 2005; Appraisal Dt. Jan. 2007; Trend 0.00000; Construction Quality D-...C

Parcel Number	Rec Num	Sale Price	Sale Date	Trnd Sale Price	Land Val.	Ind. Bldg Value	Man'l Cost	Ind. Index	Year Blt	Cnst Qlty	Nbhd
22-0.4-17-02-07-070.010	316	119500	3/2006	119500	15665	103835	43497	2.39	2005	D	15
22-0.3-07-03-01-010.110	345	153500	3/2005	153500	17625	135875	56568	2.40	2005	D	15
22-0.4-17-02-01-100.400	351	165000	6/2005	165000	23970	141030	43476	3.24	2005	D	15
22-0.9-30-02-02-017.000	359	287000	3/2006	287000	27662	259338	107552	2.41	2005	C	17
22-0.3-07-03-01-001.021	146	152500	8/2004	152500	18976	133524	53840	2.48	2004	D	15
22-0.3-07-03-01-001.009	168	137000	2/2005	137000	11985	125015	45074	2.77	2004	D	15
22-0.3-07-03-01-010.270	311	114500	3/2005	114500	15872	98628	34565	2.85	2004	D	18
22-0.3-07-03-01-010.090	339	137000	2/2005	137000	11985	125015	45074	2.77	2004	D	15
22-0.3-07-03-01-005.000	109	122000	8/2003	122000	18800	103200	50604	2.04	2003	D	15
22-0.4-20-01-36-036.000	134	134000	3/2004	134000	19417	114583	46038	2.49	2003	D	18
22-0.3-07-03-01-005.030	145	134000	8/2004	134000	14805	119195	48359	2.46	2003	D	15
22-0.3-07-03-01-010.060	353	176000	6/2006	176000	18750	157250	59679	2.63	2003	D	17
29-0.2-04-03-10-030.010	388	55900	6/2005	55900	2262	53638	22413	2.39	2003	D	13

EXHIBIT 5.31 page 5 of 5

Superior County, Missouri
Depreciation Study
Appraisal Yr 2007; Index 2.80; Neighborhood 17; Sale years 2004-2007; Construction Qualities F to A

Uniform Parcel Number	Rec Num	Sale Price	Sale Date	Trended Sale Price	Land Value	Indicated Building Value	RCN	Ind. Cond.	Current Cnd	Obs.	Chart Cnd	Yr Bld	Qty	Nbhd
22-0.9-30-02-02-017.000	359	287000	3/2006	294175	27662	266513	307,292	0.867	0.98	1.00	0.98	2005	C	17
22-0.3-07-03-01-010.060	353	176000	6/2006	179080	18750	160330	170,514	0.940	0.98	1.00	0.94	2003	D	17
22-0.4-19-02-18-010.000	352	175000	4/2005	184188	45000	139187	129,686	1.073	0.98	1.00	0.93	2002	D	17
22-0.4-19-02-18-020.000	356	196500	5/2006	200430	46500	153930	167,688	0.918	0.98	1.00	0.93	2002	D	17
22-0.4-19-02-05-020.480	357	205000	9/2005	213200	24750	188450	155,441	1.212	0.98	1.00	0.93	2002	D+	17
22-0.4-19-02-05-020.120	347	156000	4/2005	164190	21158	143032	145,673	0.982	0.98	1.00	0.89	1999	D	17
22-0.9-30-04-01-040.290	346	155000	6/2005	162363	27625	134737	138,226	0.975	0.98	1.00	0.88	1998	D	17
22-0.9-30-04-01-040.310	350	164900	5/2005	173145	27625	145520	136,480	1.066	0.90	1.00	0.88	1998	D	17
22-0.4-19-03-02-140.000	348	160000	6/2006	162800	23735	139065	162,869	0.854	0.90	1.00	0.76	1987	D+	17
22-0.4-19-04-06-010.000	355	195000	5/2005	204750	26640	178110	177,820	1.002	0.90	1.00	0.79	1986	C-	17
22-0.4-19-04-06-010.000	355	195000	5/2005	204750	26640	178110	177,820	1.002	0.90	1.00	0.79	1986	C-	17
22-0.4-19-01-40-011.001	196	141500	8/2005	147514	30023	117490	133,104	0.883	0.90	1.00	0.71	1984	D+	17
22-0.4-19-01-40-110.010	360	141500	8/2005	147514	30023	117490	133,104	0.883	0.90	1.00	0.71	1984	D+	17
22-0.4-19-02-11-030.000	336	135000	6/2006	137363	30024	107338	115,004	0.933	0.85	1.00	0.66	1981	D	17
22-0.4-19-02-04-020.000	314	116000	5/2006	118320	18000	100320	159,884	0.627	0.85	1.00	0.64	1980	D+	17
22-0.4-19-04-03-020.000	188	161500	7/2005	168768	33165	135602	223,480	0.607	0.80	1.00	0.62	1979	D+	17
22-0.4-19-04-03-020.000	349	161500	7/2005	168768	33165	135602	223,480	0.607	0.80	1.00	0.62	1979	D+	17
22-0.4-19-03-04-050.000	341	140000	10/2005	145250	22500	122750	181,765	0.675	0.80	1.00	0.66	1974	C-	17
22-0.4-19-03-04-050.000	153	160000	9/2004	171200	25988	145212	202,524	0.717	0.80	1.00	0.58	1974	D+	17
22-0.4-19-03-04-050.000	195	146400	10/2005	151890	22500	129390	181,765	0.712	0.80	1.00	0.58	1974	D+	17
22-0.4-19-02-06-090.000	328	125000	4/2006	127813	20145	107667	133,098	0.809	0.80	1.00	0.53	1972	D+	17
22-0.4-19-03-03-130.000	363	167000	6/2006	169923	24480	145442	207,732	0.700	0.75	1.00	0.60	1970	C-	17
22-0.4-19-02-04-010.000	143	120000	7/2004	129000	24570	104430	143,205	0.729	0.75	1.00	0.53	1970	D+	17
22-0.4-19-02-03-002.000	118	165000	1/2004	179850	32076	147774	172,608	0.856	0.85	1.00	0.60	1969	C-	17
22-0.4-19-03-03-050.000	364	164000	5/2006	167280	29776	137504	210,328	0.654	0.75	1.00	0.60	1969	C-	17
22-0.4-19-02-03-080.000	281	86000	1/2006	88580	25984	62596	72,981	0.858	0.75	1.00	0.53	1969	D	17
22-0.4-19-02-04-090.000	330	127500	9/2005	132600	18000	114600	111,838	1.025	0.80	1.00	0.53	1969	D+	17
22-0.4-19-02-11-008.000	117	100000	1/2004	109000	15000	94000	123,705	0.760	0.75	1.00	0.48	1965	D+	17
22-0.4-19-02-11-080.000	327	125000	4/2005	131563	15000	116562	123,705	0.942	0.75	1.00	0.48	1965	D+	17
22-0.4-19-01-29-010.000	125	72500	4/2004	78481	15345	63136	76,576	0.824	0.70	1.00	0.43	1960	D	17

1. Neighborhood Sales Ratio

The neighborhood sale ratio study is the primary tool used to measure mass appraisal performance. A ratio study compares appraised value to sale price. The sale ratio is calculated by dividing the appraised value by the sale price. Sale ratios over 100% indicate that the appraised value is higher than the sale price; ratios under 100% indicate that the appraisal is under the sale price or low, relative to the market.

Sale data should be grouped by neighborhood. Neighborhoods may be any size and may be defined as a geographical area which exhibits homogeneous traits such as age, quality, size, lot size, proximity to services, economic influence or use. A single neighborhood does not necessarily have to be contiguous, although single non-contiguous neighborhoods need to be examined closely in order to avoid drawing conclusions which misrepresent the influence of location. One concern in neighborhood definition is designating neighborhoods that are too small in area, which may not provide sufficient number of sales from which to draw meaningful conclusions.

After the sale ratios are calculated, they may be analyzed to determine some key statistics. Useful statistics include the mean, median and weighted mean ratios. These ratios are measures of central tendency and they provide an insight as to the LEVEL of the appraisals. The mean ratio is simply the arithmetic mean, calculated by summing the ratios and dividing by the number of observations or sales. The median ratio is the midpoint, where half of the ratios are above and the other half are below. To find the median, array the sale ratios (place them in ascending or descending order) and count to the midpoint. If the array contains an even number of ratios, then find the center two ratios, add them together and divide by two. The third average ratio to consider is the weighted mean. The weighted mean is calculated by summing the appraised values and dividing by the sum of the sale prices.

In addition to measures of central tendency, attention should be given to the degree of UNIFORMITY. Uniformity tells how consistent or uniform the appraisals are relative to their sale prices. The coefficient of dispersion (COD) is the primary statistic used in mass appraisal to measure the degree of uniformity or quality of the appraisal program. To calculate the COD, complete the following steps:

(1) find the absolute deviation from the median for each sale ratio. The difference between the sale

ratio and the median (ignoring the plus or minus sign) is the absolute deviation.

(2) sum the absolute deviations and divide by the number of ratios. This result is the average absolute deviation.

(3) divide the average absolute deviation by the median and multiply by 100. The result is the coefficient of dispersion expressed as a percentage.

Ratio study performance standards published by the International Association of Assessing Officers (IAAO) include the following:

Appraisal level: within 10% of the statutory level or between 90% and 110%.

Appraisal uniformity: single-family residences, generally 15% or less.

Newer homogeneous areas: 10% or less.

Another useful statistic is the Price Related Differential (PRD). The price-related differential measures assessment regressivity or progressivity, and is calculated by dividing the mean by the weighted mean. Appraisals are considered *regressive*, PRD greater than 1.03, if high-value properties are under-appraised, and *progressive*, PRD under 0.97, if high-value properties are over-appraised.

Both regressive and progressive PRD's may be caused by misclassifications or systematic problems in appraisal schedules or techniques. Although the PRD may be an indicator of appraisal bias, it is not proof since sampling size can influence results or random sampling error may occur.

See *Exhibit 5.32* for a simple demonstration of the basic statistics described.

2. Land Analysis

Land analysis is conducted to determine the proper land unit rate. The unit rate is expressed in terms of a unit of comparison and may be dollars per front foot, per square foot, or per acre. Ideally, the land unit rate is based on an analysis of vacant or unimproved land sales. Typically, however, the analysis will include improved sales which must be adjusted to account for the improvement value.

After the indicated unit prices are calculated, the appraiser will group the land value indications together for comparable areas, array the indicated land unit rates and determine the base land unit rate. In addition the appraiser should examine the indicated land unit rates for variations and

determine the cause or reason. Differences in the indicated land unit rates may become the basis for adjustments. For example, parcels that suffer from extreme topography or benefit from an excellent view may yield indicated land unit rates far worse or much better than the typical in a given area. By comparing the extreme rate to the typical rate, a percentage adjustment may be determined which accounts for the difference. For example, if the typical indicated rate is \$100 per front foot, and a sale parcel with poor topography sells for \$80 a front foot, the appraiser might conclude that poor topography deserves an adjustment of \$20 per front foot ($\$100 - \80) or a minus twenty percent (-20%). Note, in many applications the adjustment may be expressed as a factor, i.e. 80%.

3. Depreciation Study

In the depreciation study, sales are analyzed to determine, directly from the market, the amount of accrued depreciation or the indicated condition of a sale parcel. The indicated condition, expressed as a percent good, is dependent on two key items. First, the land value abstracted from the sale price must be reasonably current or the resulting indicated building value will be mis-stated.

Second, the estimate of the replacement cost new (RCN) must be close to current cost or the indicated condition will be over-stated. For example, if a property sold for \$100,000 and the land value is estimated at \$10,000 when the land value is actually \$20,000, then the indicated building value appears to be \$90,000 when it should only be \$80,000. In addition, if the true RCN is \$125,000 but the study uses an RCN of \$100,000 then the resulting indicated condition appears to be 90% ($90,000 / 100,000$) not the true 64% ($80,000 / 125,000$).

The depreciation study provides an indication of net condition and caution must be exercised in applying the results. Net condition reflects not only physical condition, but also the influences of external obsolescence as well as any functional obsolescence that might be present in the subject improvement.

4. Index Study

An index study is performed to determine a factor (index) which will update costs from an appraisal manual to current construction costs within a county.

Data used in the index study should consist of sales new construction or cost information from actual

turn-key, contract built homes, including labor, profit, materials, and any other pertinent costs or fees associated with the construction. Homes built using owner labor are not proper subjects for this study, as construction costs (labor costs) typically are understated and quality are usually influenced. Homes should be of “average” quality for the year built, which may or may not be the “typical” home built in a particular county. Sales or construction costs from the past year up to the past three years may be used. By using data up to three years old, the appraiser may be able to observe market changes or trends. Depending on quantity and quality of the sale or construction cost data, emphasis may be placed on the results from the current year, past two or all three years samples.

EXHIBIT 5.32
NEIGHBORHOOD SALES RATIO

Sale Number	Appraised Value	Sale Price	Ratio	Absolute Deviation
8	\$ 82,000	\$ 118,000	0.70	0.19
4	90,000	120,000	0.75	0.14
7	98,750	125,000	0.79	0.10
2	92,400	105,000	0.88	0.01
6	82,800	92,000	0.90	0.01
3	95,000	100,000	0.95	0.06
5	111,550	115,000	0.97	0.08
1	86,700	85,000	1.02	0.13
Totals:	739,800	860,000	6.96	0.72

Mean Ratio **0.87**
Median Ratio **0.89**
Weighted Mean Ratio **0.86**
Coefficient of Dispersion **(0.72/8) = 0.09**
(0.09/0.89) X 100 = 10.11%
Price-Related Differential **0.87 / 0.86 = 1.01**