

PROCEDURES FOR CONTRACTED SERVICES - BORDEN COUNTY APPRAISAL DISTRICT

REAL PROPERTY PROCEDURES

The appraisal firm that is contracted by the Borden County Appraisal District will follow the applications of the ad valorem tax laws of the State of Texas and their appraisals will comply with Section 25.01 of the Texas Property Tax Code and all other applicable statutes and laws. The contractor will also follow Section 23.01 of the Property Tax Code relating to the Uniform Standards of Professional Appraisal Practices (USPAP), as it applies to the properties located in the Borden County Appraisal District, for ad valorem tax purposes. All properties will be appraised by competent experienced personnel properly registered with the Texas Department of Licensing and Regulation (TDLR).

- The contracted appraisal firm will appraise all real property within the jurisdiction for ad valorem purposes and will gather and compile as of January 1 of each tax year all information and data needed and reasonably available pertaining to the value of such properties. They furnish the data and information to the Borden CAD for the purpose of equalizing valuations of properties with other properties in the district for each year covered by the contracting appraisal firm.
- The appraisal firm will reappraise all market value accounts so that all market value parcels will be reappraised within a three (3) year period covered by the contract. The appraisal firm will work with the Chief Appraiser to determine the parcels that will be inspected within each year as defined in the CAD's Reappraisal Plan.
- The appraisal firm will appraise all new construction within the district.
- The appraisal firm will reappraise all altered, remodeled or enlarged structures.
- The appraisal firm will appraise all real property newly incorporated into the district by annexation into 1 or more taxing units.
- The appraisal firm will reappraise all real property which has been rezoned from the previous year.
- The appraisal firm will reappraise all real property in the vicinity of any newly dedicated or constructed road or highway.
- The appraisal firm will make necessary changes to legal descriptions for all properties appraised.
- The appraisal firm will meet all deadlines within the Tax Code so that the CAD will meet its deadlines as per the Tax Code.
- The appraisal firm will furnish expert testimony to support the appraisals submitted to the Appraisal Review Board (ARB).
- All protests will be sent to the appropriate contracted appraiser.

MINERAL/INDUTRIAL/UTILITY/PERSONAL (MIUP) PROPERTY PROCEDURES

The appraisal firm that is contracted by the Borden County Appraisal District will follow the applications of the ad valorem tax laws of the State of Texas and their appraisals will comply with Section 25.01 of the Texas Property Tax Code and all other applicable statutes and laws. The contractor will also follow Section 23.01 of the Property Tax Code relating to the Uniform Standards of Professional Appraisal Practices (USPAP), as it applies to the properties located in the Borden County Appraisal District, for ad valorem tax purposes. All properties will be appraised by competent experienced personnel properly registered with the Texas Department of Licensing and Regulation (TDLR).

- The contracted appraisal firm will appraise all real property within the jurisdiction for ad valorem purposes and will gather and compile as of January 1st of each tax year all information and data needed and reasonably available pertaining to the value of such properties. They furnish the data and information to the Borden CAD for the purpose of equalizing valuations of properties with other properties in the district for each year covered by the contracting appraisal firm.
- The appraisal firm will compile the following appraisal records required by the Property Tax Code in the form and manner required by the Code for the MIUP properties and furnish the records to the Borden CAD staff prior to certification as requested by the Chief Appraiser.
 - Copies of Recaps that show estimated value for each taxing unit in the district
 - Copies of the Appraisal Records
 - Copies of Notices of Appraised Value (Including Supplemental Notices)
 - Copies of the Appraisal Roll for the CAD and each taxing unit in the district
 - Copies of Division Orders listing all current record owners of interest in oil and gas producing properties for the CAD and for each taxing unit in the appraisal district
- The appraisal firm will make available the appraisals of property and the supporting data relating to the appraisals to the CAD for the purpose of equalizing valuations of properties with other properties in the district.
- The appraisal firm will furnish expert testimony to support the appraisals submitted to the Appraisal Review Board (ARB).
- The appraisal firm will meet with taxpayers who respond to the Notices of Appraised Value and review with them the appraisals of their property and will meet with the ARB when necessary and present testimony and evidence as to the value of any property being protested. They will assist the Borden CAD in the equalization of values of the subject property until a decisive action is taken in fixing and equalizing the values for taxation for the tax years covered in the contract.
- All protests will be scanned and sent to the appropriate contracted appraiser.

MAPPING PROCEDURES

All maps are sent to the mapping contractor for scanning and then returned to the Borden CAD. All tracts are identified by a Parcel ID number for representation of owner within the CAMA system. Once the base map with property lines and Parcel ID's have been established, the maintenance phase begins. During this process, the Borden CAD sends the necessary changes from deeds, plats or cards for proper changes on the map.

- If there is a split or redraw, a Parent Tract Card (person selling/grantor), the card for the split (grantee) and the deed that goes with the split. The deed needs to match the acres on the split or redraw card and have complete metes and bounds unless it is a lot and block in an already platted subdivision.
- Straight ownership changes are not needed. When an update is run, the map will reflect the ownership change made in the system.
- Deleted parcels are sent to the contractor.
- New plats are sent with the parcel IDs labeled on the lots. They will be scanned, traced and added to the map.
- Updates are done quarterly by the contractor.

STANDARDS FOR CONTRACTING SERVICES

Assessment Contracts are developed to provide assessment services to governmental agencies by firms or private individuals. Assessment service contracts can cover any services relating to discovery, listing, appraisal, and assessment of property, including data collection, mapping, development of construction cost or valuation manuals, complete or partial revaluations, specialized consulting services, tax policy matters, and system design and implementation, including development of appraisal and assessment software.

Request for Proposal (RFP): Purpose: It sets forth the requirements of the project. It should clearly describe the desired products or services, performance standards, completion dates, and any continuing responsibilities of the contractor.

Company Qualifications: The RFP should require the bidders (potential contractors) to demonstrate expertise, experience, and other qualities affecting the probable success of the project. The contractor should possess sufficient financial resources and personnel to ensure continuing commitment to the project and should be adequately insured. The agency should require and carefully review audited financial information on the contractor. References and the Federal Employee Identification Number or other required identification should be requested in the RFP. The RFP should address the acceptability and potential role of subcontractors. The same performance standards that apply to the primary contractor should also apply to subcontractors. The primary contractor's proposal should identify the contemplated use of subcontractors and, ideally, name them and describe their qualifications and role in the project.

Personnel Qualifications: The RFP should require proposals to identify key individuals to be assigned to the project, along with their qualifications and specific roles. The RFP should specify the qualifications of the individuals who will perform the work described, because the quality of project products and services will depend heavily on their expertise. The same qualifications should apply to subcontractor personnel. In some cases, it may be appropriate to require testing or certification of individuals assigned to the project.

Definition of Requirements: The RFP should set forth the requirements of the project in sufficient detail to allow full understanding of the desired results. This will serve to clarify the expectations of the assessment agency and provide a good reference for the evaluation of submitted proposals. The RFP should identify the agency's hardware, software, personnel, office space, equipment, and any operating constraints that should be taken into consideration by the contractor in developing its proposal.

Project Tasks: The RFP should identify and describe the various tasks and functions to be performed in the project. Each task should be clearly described with respect to content, method of operation, documentation, and expected results.

Project Products: The RFP should describe the content, significant features, and performance standards of all products or items to be provided. The more clearly the project products and output can be described in the RFP, the more likely the assessment agency is to obtain results that meet its needs and expectations. The RFP should specify the eventual ownership of project products, including all data generated.

Training and Education: The RFP should identify the responsibilities of the contractor with respect to training and education of agency personnel in the use of the new system, products, or services. This should include a description of the numbers, content, and duration of any formal training sessions, as well as instructors, materials, and training aids to be provided to the agency.

Public Relations: The RFP should identify the responsibilities of the contractor with respect to public relations. This might include public hearings and meetings, media contact, Internet access, and the response to inquiries and information requests. Public relations are particularly important in data collection. See Standard on Public Relations (IAAO 2001).

Documentation and Maintenance: The RFP should describe required documentation and maintenance activities.

Compliance with Local and State Regulations: The RFP should include copies of state or local regulations under which the contract must be performed and should identify requirements that will be imposed upon the successful bidder. If the RFP concerns an appraisal project, it should include state and locally mandated appraisal standards. If the contractor has access to confidential information, the RFP should identify the state or local regulations that require confidentiality and should inform bidders that they will be required to execute confidentiality agreements.

Defense of Appeals and Litigation: The RFP should identify any obligation of the successful bidder to support and defend appraisals, valuation manuals, or other project products during appeals and litigation proceedings. The RFP should include a description of the appeals period, the expected nature of the support or testimony, the duration of such obligations, and procedures for payment of the contractor for services provided during litigation and appeals. See Standard on Assessment Appeals (IAAO 2001).

Time Frame, Milestones, and Completion Dates: The RFP should identify the time frame, milestone dates, reports, and the completion date of the project. Contractor responsibilities beyond the date of completion should also be specified in the RFP.

Equal Opportunity and Affirmative Action: The RFP should clearly specify if the assessment agency is an equal opportunity and affirmative action employer. If the contractor will be required to provide an affirmative action plan or related reports as proof of nondiscrimination, this should be stated in the RFP. Other jurisdictional provisions should be stated.

Evaluation Procedures: The RFP should explain the basis on which proposals will be evaluated and selected, including required submission dates, oral presentations, and other review and selection procedures. Some important dates include the date by which letters of intent to file a proposal must be received, the date by which proposals must be received, and the date on which proposals will be opened. The RFP should also specify the method of packaging and labeling proposals, so that they are not inadvertently opened before the scheduled date.

Clarifications: The RFP must identify the issuing agency, the contract administrator, and procedures to be followed for receiving clarification or interpretation of the specified requirements. All questions should be directed to and handled by the contract administrator to ensure consistency in responses. It is good practice to prepare a written list of questions and answers concerning the RFP to be disseminated to potential contractors, so that they all have the same information and can respond on the same basis. Advisory Committee: It may be helpful to form a project advisory committee, made up of key people involved in the project, to coordinate development of the RFP, the evaluation of bids, and awarding of the contract. The committee might later serve as the project review committee (see section 5.4).

Selection Criteria: Proposals submitted in response to an RFP should be evaluated based on responsiveness, the bidder's qualifications, and cost. To receive earnest consideration, a proposal should address all major points covered in the RFP. Proposals should describe the bidder's experience on similar projects and the qualifications of key personnel to be assigned to the project. Although cost is an important selection criterion, the successful bidder should not be chosen based on cost alone. The assessment agency should expect to negotiate contracts when hiring vendors of professional, highly technical services and products. The assessment agency must be confident that the selected bidder can implement the program requirements in a timely manner. It is highly desirable that the chosen contractor be one who has successfully completed similar projects. The evaluation of proposals must be objective. The assessment agency should prepare a checklist of required and desirable features with predetermined evaluation criteria when selecting a contractor. References should be fully verified by the agency.

Contract Provisions: The contract establishes the legal obligation of all parties with respect to the project. It should incorporate the salient features of the RFP and of the successful proposal.

- Detailed description of the work to be performed
- The time frame, delivery date, and other requirements of the project
- The amount and terms of the contract delineating all expenses (travel and other expenses), including all billable expenses
- Authorized signatures of the assessment agency and other parties
- Performance standards
- Testing standards and procedures
- Performance bonds and other insurance coverage, including indemnification and hold harmless clauses
- Required documentation
- Implementation, installation, and delivery dates
- Responsibility for maintenance and upgrades
- Payment provisions
- Termination rights and compensation or penalty payments to the agency in the event of failure to perform, unavailability of funds, liquidation, or other factors
- Arbitration of contractual and other disputes
- Confidentiality agreements
- Other relevant considerations

With respect to payment provisions, the assessment agency should be careful not to commit to paying fully for a product or service until it has been satisfactorily delivered and tested. Two ways of doing this are through a “holdback” and a “performance bond.” In a holdback provision, a specified percentage of the contract amount is withheld until final approval and sign-off on the project. In a performance bond, a third party, in effect, “insures” the contractor’s performance. In some cases, it may be appropriate to require a performance bond of up to 100 percent of the amount of the contract. Usually, one method will suffice. All parties should carefully review the contract, obtain legal guidance, and sign only when fully satisfied that the contract adequately addresses all critical points and concerns. The contract must stand on its own; verbal agreements and understandings should be completely avoided. If a contract is amended, the addendum should reference the original contract and clearly designate the new provisions or modifications (see section 5.3). The agency should retain the right to approve the substitution of key individuals assigned to the project and to remove unsatisfactory contractor or subcontractor employees from the project.

Multiple Contracts: In large projects, such as a complete revaluation, the assessment agency can consider issuing multiple RFPs for various functions or tasks. This can be advantageous when the tasks are large, unrelated, and require different expertise. Multiple contracts, however, require that the agency have specific skills in project coordination and management. The contracts must be complementary, cover all requirements, and clearly delineate each contractor’s specific responsibilities. A special case of a multiple contract is a phase arrangement in which separate contracts are set for two or more phases of the project. A type of phase contract is a single contract that allows the agency to cancel the contract at various phases of the project. Although these arrangements provide added flexibility to the agency, they can also introduce added uncertainty as to the outcome and cost of the project.

Subcontracts: The successful bidder may let subcontracts with other parties for the provision of specified assistance or services. This can be beneficial to the project when the subcontractor possesses specialized expertise and can offer a product or service not directly available from the primary contractor. The agency should retain the right of approval of any subcontractor. The contract should formally establish the roles or potential roles of subcontractors. The contract, however, should always hold the primary contractor responsible for full and successful completion of the contract requirements.

General Requirements: Agency personnel must work closely with the contractor throughout the project to ensure full understanding and confidence in the system. They must be able to operate, maintain, and support the system once the contract is completed. Similarly, the assessment agency must possess, train, or acquire an internal staff that can use the contractor’s products and services effectively.

Planning and Review: At the inception of the project, the assessment agency and successful bidder must establish a mutually agreeable master work plan for timely completion of the project. The work plan should establish required completion dates for all major tasks and subtasks involved in the project and should include review periods of adequate duration to permit the agency to evaluate and test project products and results thoroughly before signing off on them. Both parties to the contract should continually monitor the progress of the project against the master work plan. Various project-planning aids, such as “Gantt” and “CPM” charts, can be helpful in this regard. The contracting parties should always strive to anticipate and plan for the resolution of problems rather than having to react to missed completion dates. Slippage in some target dates may not be critical in that their delay may not affect the start of other tasks. The lack of critical deadlines, however, requires special measures and extra resources to put the project back on track. The key to a successful project is continual control by the assessment agency. The assessment agency must always know exactly what has been accomplished and what remains to be done. It should ensure that each project and all completed items meet required standards. All concerns of the assessment agency should be brought to the immediate attention of the contractor. Both parties will find it much easier and more satisfying to make required modifications as the project proceeds rather than to address unresolved issues after completion. Although the assessment agency should strive for a harmonious working relationship with the contractor, it is equally important that the agency ensure that its requirements have been satisfactorily met before accepting tasks as completed and disbursing payments.

Contract Modifications: During a project, a change in requirements may be desired. If the change is agreeable to both parties, the assessment agency should prepare an addendum clearly specifying the revisions. Signature by authorized representatives of both parties make the addendum as binding as the original contract. If a project falls far behind schedule, revisions to the master work plan can be considered. This is generally preferable to lowering project requirements or standards. The assessment agency should never let delays or failures to meet requirements develop to the point that a successful conclusion to the project is no longer feasible. If the contract or work plan cannot be amended by mutual agreement, then the assessment agency should seek legal advice to resolve the matter.

Project Review Committee: For projects that affect several departments or that have multiple objectives, a project review committee can provide the agency with an effective mechanism for internal coordination, monitoring, and review. The committee should include representatives from all departments or sections of the agency affected by the project. Ideally, this committee would develop the RFP, review the bids, and coordinate implementation of the project (see section 3.6). The committee should meet regularly (at least monthly) to discuss the status of the project, review products and results, and coordinate implementation of manuals, procedures, software, or other items provided in the project. The committee should also meet regularly with the contractor to discuss current developments, provide direction and feedback, and discuss upcoming tasks and areas of concern. The committee should actively guide the project and review results to ensure successful completion of the project.

Contract Monitors: A contract monitor is generally a party hired by the agency to review the services and products provided under the contract (the monitor may also be an independent third party). An effective monitor must be thoroughly familiar with the RFP and successful bidding and may also have served as a consultant in the development of the RFP or selection of the successful bidder. The contract monitor must stay in close contact with the project and review major tasks in a timely manner. A contract monitor can be valuable in providing the assessment agency with specialized expertise that will help ensure the success of the project. The monitor can also bring a useful, independent perspective to evaluation of the project's products and services. The contract monitor must be able to command the respect of the agency and contractor alike.

Data Collection: Collection of property characteristics data may be part of a contract for implementation of a mass appraisal system, or it may be the subject of a separate contract. Data collection (or reverification) is one of the most critical and typically the most expensive phases of any reappraisal project. The key to a successful data collection project is the establishment of clear and standard coding requirements and the careful monitoring of achievement of such requirements through a quality control program. The development and use of a data collection manual is essential in achieving uniformity in data collection. The RFP should specify the types and approximate number of parcels involved in the project, the property characteristics to be examined and codified, standards for data capture and coding accuracy, and procedures for measuring achievement of accuracy standards.

- Property characteristic data collection or reverification should be highly accurate.
- Objective categorical or binary data fields include property characteristics such as exterior wall material, number of full bathrooms, and waterfront view.
- For an objective categorical or binary data field collected or reverified, ninety-five percent of the coded entries should be accurate.
- Continuous area, volume or linear measurement data (such as square feet of living area, garage size, and tank capacity and exterior wall height should be obtained by direct measurement.
- Continuous area or linear measurement data should be accurate within one foot (rounded to the nearest foot) of the true dimensions or within five percent of the actual area of improvement.
- Continuous volume data should be accurate within five percent of the true capacity of the improvement.
- When direct measurements are not possible, calculated areas, dimensions or volumes must be estimated and an exception statement should be provided on the property record.
- Subjective categorical data characteristics include data items such as quality grade, physical condition, architectural style, and effective age.
- For a subjective categorical data field collected or reverified, ninety percent of the coded entries should be accurate.
- Accuracy of subjective data items can be supported primarily by conformity with written specifications and examples in the data collection manual.
- Subjective data judgment calls may also be substantiated by field notes when the data collection manual does not provide sufficient guidance.
- Data entry accuracy should be as close to one hundred percent as possible and supported by a full set of range and consistency edits.
- Statistical quality assurance tools should be used to measure and verify the attainment of accuracy standards.
- Routine checks of field work should begin immediately after the field data collection phase commences.
- Independent quality inspections may be performed by jurisdiction staff, project consultation, auditing firm and oversight agency.
- Quality inspections should be conducted on a continuous basis
- Quality control samples of completed field work should be selected at random and reviewed for completeness and accuracy.
- Random quality control samples may be stratified by geographic area, property type or individual data collector.
- The evaluation of completed data collection work should be performed promptly and reported to the contractor.
- Data collectors should be required to recanvas any geographic area or stratum that fails to meet quality standards.
- Jurisdictions should routinely audit data entry work and test field input devices to verify that accuracy goals have been met.

In most cases, the assessment agency will have a current file of property characteristics, and the RFP should specify the extent to which the contractor should rely on this file. The RFP should specify whether the contractor is to use data collection forms, manuals, and coding procedures supplied by the assessment agency or if new ones are to be developed. The qualifications of data collectors should also be set forth in the RFP. The RFP should indicate whether interior inspections are required and, if so, what actions to take when property owners are away or refuse entry. The minimum number of properties to be entered should be stated. The assessment agency and contractor should establish quality control procedures to ensure that accuracy standards are attained. The agency can address these in the RFP or request bidders to address them in their response to the RFP. In any case, the assessment agency should carefully monitor compliance with such standards and procedures. Good quality control procedures include sample audits (particularly at the start of the project), computerized edits for reasonableness and consistency of data, and pilot testing of mass appraisal models using the new data.

Cadastral Mapping: RFPs and contracts should specify geographic areas to be mapped; source and quality of control networks, process for constructing base maps and aerial images; specifics of digital deliverables such as file formats, map/data layers, annotation and attribution, metadata, and expected map accuracy; and for cadastral compilation, procedures to be followed in researching parcel boundary information and resolving gaps, overlaps, and closure errors. The assessment agency should review the initial maps and check samples as produced to ensure that these requirements have been met.

Manuals: RFPs for appraisal and assessment manuals should specify the required content and format of the manuals. The assessment agency should specifically identify all major features desired in the manual. A cost manual RFP, for example, should address such issues as types of properties and components to be included in the manual, sources and documentation of cost data, types of cost reported in the manual, development of cost models, provision of photographs, required time and location adjustments to reflect the legal assessment date and local market, source and format of depreciation schedules, and organization of the manual. The RFP should specify the required number of copies and provisions for updating the manual. The contract should state procedures for reproduction and distribution of manuals. An outline of the manual should be reviewed before the project begins to be sure that all required features have been included. Drafts of each chapter or section should be thoroughly reviewed as they are produced. Before publication, a complete draft of the manual should be reviewed, and field tested to assure that it is supported by market experience.

Revaluations: An RFP for revaluation services should carefully set forth the scope of the project. A revaluation project can include such major tasks as data collection, development of forms, mapping and GIS development, valuation models, development of appraisal manuals, software development, training, public relations, and defense of assessment appeals. These tasks should be described in sufficient detail to make the agency's requirements and performance standards clear to potential bidders. The quality of a revaluation is measured by a ratio study. The contractor and client should agree to the design for the ratio study. The design should specify the rules and procedures for sales confirmation, sales validation, adjustments to sales prices, time trending, trimming of outliers, and use of confidence levels. The design should also specify the nature of the sample used to test the revaluation. The sample should provide assurance of similar impact on sold and unsold properties. Jurisdictional requirements for the period from which the test sample will be drawn should be considered.

Specialized Consulting Services: An RFP or a contract for specialized consulting services (such as auditing, ratio studies, modeling, appeal assistance, including expert witness testimony, appraisal of special properties and tangible personal property, and management and performance reviews) should address the definition and scope of the task, statutory requirements, adherence to the Uniform Standards of Professional Appraisal Practice (USPAP), the timeline, confidentiality requirements and agreements, performance standards, contract dispute resolution, ownership of the product, payment schedules, and contract start and termination dates.

System Design and Implementation: An RFP for system design and implementation will be concerned primarily with software specifications and should set forth performance requirements in reference to existing procedures and desired results. Items that need to be addressed include hardware constraints, report writing capability, legal requirements, program requirements, programming language, transferability, maintenance and updates, program support and documentation, license, copyright, and training. It is also important to clarify the ownership of the developed software, including the source code and data generated. Documentation should be addressed. User documentation relates to manuals and other instructional materials that explain proper use and operation of the system, including such items as completion of forms, classification and grading of buildings, valuation procedures, interpretation of reports, and use of computer terminals. Programmer documentation relates to data processing manuals and instructions that are required by local systems analysts and programmers to understand, maintain, and modify any computer programs provided under the contract. The RFP should specify the type of programmer documentation (such as flow charts, data definitions, and formulas) required by the jurisdiction. The RFP should also require that the source code (computer programs) either be provided to the assessment agency, while giving appropriate copyright protection to the vendor, or be placed in escrow with a neutral third party in the event of a contract dispute or the inability of the vendor to service the software. The RFP should also describe all service contract obligations on the part of the contractor to maintain and modify the software once installed, including modifications to comply with statutory and legal changes. The contract should establish the criteria for deciding when such modifications are complex enough to warrant additional charges beyond the basic contractual service obligations. The contract should also specify who makes that decision and the timing of such modifications.

The appraised value of real estate is calculated using specific information about each property. Using computer-assisted appraisal programs and recognized appraisal methods and techniques, we compare that information with the data for comparable properties and with recent market data. The district follows the standards of the International Association of Assessing Officers (IAAO) regarding its appraisal practices and procedures and subscribes to the standards promulgated by the Appraisal Foundation known as the Uniform Standards of Professional Appraisal Practice (USPAP) to the extent they are applicable. In cases where the appraisal district contracts for professional valuation services, the contract that is entered into by each appraisal firm requires adherence to similar professional standards.

Section 6.05, Tax Code, is amended by adding Subsection (i) to read as follows:

- (i) To ensure adherence with generally accepted appraisal practices, the Board of Directors of an appraisal district shall develop biennially a written plan for the periodic reappraisal of all property within the boundaries of the district according to the requirements of Section 25.18 and shall hold a public hearing to consider the proposed plan. Not later than the 10th day before the date of the hearing, the secretary of the board shall deliver to the presiding officer of the governing body of each taxing unit participating in the district a written notice of the date, time, and place of the hearing. Not later than September 15 of each even numbered year, the board shall complete its hearings, make any amendments, and by resolution finally approve the plan. Copies of the approved plan shall be distributed to the presiding officer of the governing body of each taxing unit participating in the district and to the comptroller within 60 days of the approval date.

Procedures for Periodic Appraisal

Subsections (a) and (b), Section 25.18, Tax Code, are amended to read as follows:

- a. Each appraisal office shall implement the plan for the periodic reappraisal of property approved by the Board of Directors under Section 6.05 (i).
- b. The plan shall provide for the following reappraisal activities for all real and personal property in the district at least once every three years:
 - Identifying properties to be appraised through physical inspection or by other means of identification, including deeds or other legal documentation, aerial photographs, land-based photographs, surveys, maps, and property sketches.
 - The Borden CAD annually reappraises all property in the district including residential, commercial, vacant land, mobile homes, business personal property, and mineral, industrial, and utility real and personal properties.
 - Borden CAD will research the deeds filed in the Borden County Clerk's Office and request copies of relevant deeds. These deeds are read and abstracted by the district staff. Information is recorded in the CAMA (Computer Assisted Mass Appraisal) system including grantor, grantee, date of recording, date of sale, any pertinent property or deed information, and file number of county clerk's record. Property identification numbers are assigned to each parcel of property.
 - All businesses are mailed a rendition in early January of each year. Owners are required by state law to list all their business personal property. Failure of an owner to render results in a ten percent penalty. If fraud is involved in a false rendition, it is possible a fifty percent penalty could be assessed.
 - Maps have been developed that show ownership lines for all real estate. These maps are stored digitally and are available to the staff of the district on their computer desktops. The maps are used to identify the properties and/or areas to be physically inspected.
 - Renditions are sent to and required of utility companies, compressor stations and pipelines. The valuation of these complex properties and mineral interest are outsourced to P&A (Prichard & Abbott Inc.). Copies of deeds and received renditions related to oil and gas properties are forwarded to P&A.

Identifying and updating relevant characteristics of each property in the appraisal records

- Appraisers drive the county and gather data about each home, commercial business or vacant land tract. The appraiser carries a CAMA generated property appraisal card for each property that contains information on the property and allows the appraiser to update relevant information. The appraiser notes the condition of the property and any changes to the property since the last inspection, such as measurements, additions, new construction, demolition, renovation, deterioration, rehabilitation, occupation, abandonment, etc. Pictures of the property are taken (if possible, as needed) to compare with the pictures that have been captured previously and stored in the CAMA system. Data noted on the cards and transferred to the CAMA system include an exterior sketch of the improvement, with measurements, which allows the system to calculate square footage for the various areas of the building. Components of the building such as bathrooms, fireplaces, air conditioning, type of roof and covering, type of exterior wall, type of foundation, etc. are listed and appropriate values are assigned by the CAMA system. The appraiser looks for newly constructed properties, remodeled properties or demolished property sites as he/she drives through the county.
- Business personal property is inspected each year. The appraiser looks at the quality of the inventory, how dense the stocking is, and makes general notes about the equipment seen. If his/her observation is different than the rendition made by the taxpayer, additional information is gathered, and a higher value may be assigned than the rendered amount.

Defining market areas in the district

- Appraisers combine similar types of property into "neighborhoods", market areas, or market segments. Market sales are examined to confirm which areas are similar. A "neighborhood" for analysis purposes is defined as the largest geographic groupings of properties where the property's physical, economic, governmental and social forces are generally similar and uniform, resulting in consistent and uniform values over the defined market area or neighborhood. There is no difference in how the four forces affect values throughout the county, and no discernible areas of variable value as evidenced in market sales, so we look at the whole county as a neighborhood or one, county-wide market area.

Identifying property characteristics that affect property value in each market area, including

- The location and market area of the property
- Physical attributes of property, such as size, age and condition
- Legal and economic attributes
- Easements, covenants, leases, reservations, contracts, declarations, special assessments, ordinances, or legal restrictions:
- Each parcel of property has detailed information recorded in the CAMA system. For land the legal description, dimensions, zoning, size, available utilities and special characteristics are noted in a form that can be used and compared with other land parcels.
- Each improvement shows the sketch and dimensions, a picture of the improvement, the class which indicates the perceived comparative construction quality, the actual or effective year of the construction of each part of the improvement, the type of

roof, the roof covering, the exterior covering, the foundation type, number of baths, fireplaces, air conditioning type, other attributes and overall condition of the improvement.

- Other characteristics that affect the parcel's value, such as legal and economical attributes, that are apparent from the inspection should be noted in the CAMA system for further consideration.
- Characteristics that are not physically apparent, such as easements, leases, restrictions, and other legal parameters should be noted within the CAMA system as they become evident through research in the Clerk's office or other documentation.

Developing an appraisal model that reflects the relationship among the property characteristics affecting value on each market area and determines the contribution of individual property characteristics

- The CAMA system began with the cost approach to value to estimate original cost of each improvement. That value was based on local modifiers to Marshall-Swift, a nationally recognized cost estimation system. By utilizing these cost systems, properties are equalized as to their original costs. Components measured in value include the size of the structure, number of bathroom fixtures, type of roof structure, roof covering, exterior covering, special features such as fireplaces, hot tubs, and other special amenities. The market sales were then studied for improvement contributions in each neighborhood (market area) and adjustments to value are applied to each neighborhood (market area) in the form of all types of depreciation. This resulted in a value schedule that is then analyzed each year and compared to current market sales to determine any trend or value change over time. Finally, each structure is rated as to its current condition. Ratings range from unsound to excellent.

Applying the conclusions reflected in the model to the characteristics of the properties being appraised

- By utilizing the age, quality, condition, construction components, and other variables, the model is developed and applied to all parcels within the neighborhood (market area). Similar values per square foot for similar age, construction quality and condition are assigned. Models are developed and the CAMA system applies all the factors and assigns value to each parcel.

Reviewing the appraisal results to determine value

- After completing the process of assigning values to all parcels within the neighborhood (market area) using the computer assisted mass appraisal programs, comparisons are made of those values per square foot within the neighborhood (market area) with current sales data from the neighborhood (market area). A sales ratio is run for the neighborhood (market area) to determine if the values that have been assigned are acceptable.
- Commercial property is compared by category or type of business. Adjustments are made in mass by the appraiser utilizing the CAMA system. All similar improvements are compared to verify reasonableness of value and equality.

Map Products: The assessor should be capable of providing cadastral data in a variety of formats. Providing access through the Internet, either as a map viewer or data download, allows for easy public access. An internal Intranet can provide similar access to all offices in the jurisdiction. A virtual private network (VPN) can facilitate data dissemination and sharing with stakeholders at remote sites. A geospatial personal document format (PDF) provides the user with the ability to control data layers inside the PDF. Regardless of the level of technological capabilities of the office, the assessor should be capable of providing printed cadastral maps.

At a minimum, digital cadastral map should include and be capable of displaying or printing the following elements:

- Boundaries of all parcels as polygon features
- Parcel identifiers
- Parcel dimensions as platted, deeded, or where otherwise known
- Parcel area
- Subdivision or plat boundaries as originally platted
- Subdivision or plat names and book and page number where recorded
- Block and lot lines as originally platted and block and lot numbers
- Boundaries and names of political subdivisions, such as counties, towns, townships, and municipalities
- Boundaries and names of geographic subdivisions such as section, township, and ranges, government lots, land districts, and land lots or grants
- Locations and names of streets, highways and rights-of-way, alleys, railroads, rivers, lakes, and other geographic features
- Situs addresses
- Appraisal boundaries such as market areas, neighborhoods, zoning/use, soils, floodplains, and so forth.

Cadastral maps in printed form should include other basic information and cartographic elements such as map scale, map legend, north arrow, map sheet number if applicable, title block, key or link to adjoining maps, quality standard achieved, date of publication, date of last update, and a disclaimer, caveat, or notice of intended use.

Program Management: Mapping program management includes supervision or coordination of the following:

- Cadastral and associated map layers (e.g., spatial, image, and text data)
- Ownership records
- Parcel genealogy
- Quality control
- Archival processes
- Data changes for annual tax roll
- Contractual mapping services
- Data stewardship responsibilities
- Sharing and selling of map products
- Metadata files
- Hardware and software acquisition
- Review, testing, and maintenance of software
- Procedure manual
- Training
- Public relations
- Budget.

Staff and Training: A digital cadastral mapping program requires trained staff to administer the cadastral mapping function. When sufficient staffing levels are being determined, the following should be taken into consideration:

- Functions and tasks
- Efficiency of mapping automation, processes, and workflows
- Economies of scale
- Quantity of vertical parcels (e.g., condominiums, mineral rights) and land parcels
- Geodetic densification
- Volume and complexity of deeds and plats filed that require mapping action
- Public requests
- Use of contracted mapping services
- Creation and maintenance of layers for non-assessment purposes
- Interaction with other agencies and/or users of the data.

All mapping personnel should receive training in procedures appropriate to their tasks and job descriptions. At a minimum, mapping and deed processing staff should understand the engineering basis of highway and railroad right-of-ways; the surveying basis of boundary creation and description throughout the history of the jurisdiction and appropriate legal principles of boundary and title law; and survey bearings and angles, correction angles, closure error, and closure tolerances. Once these basic competencies have been achieved, staff should be trained in techniques of mapping with coordinate geometry (COGO), computer-aided drafting (CAD), and/or digital cadastral mapping systems. Data stewards who maintain and contribute data for purposes other than basic cadastral functions may require supplemental training and resources on how to use and understand digital cadastral mapping systems and geospatial data.

Procedures, Standards, and Records: A procedure manual should be developed and kept current to ensure the work is accomplished in a timely and uniform manner. At a minimum, manuals should provide jurisdictionally acceptable detailed explanations of deed processing, production and maintenance of cadastral layers, maintenance and stewardship of noncadastral layers, data schema diagrams, workflows, and procedures for obtaining, referencing, and retaining records in accordance with applicable statutes and ordinances. Map creation and maintenance processes should be included in metadata associated with the map layers.

Preparation for a Digital Cadastral Mapping Program: Preparation, planning, and testing are essential before a new or extensively revised digital mapping program can be fully implemented. GIS Guidelines for Assessors (URISA and IAAO 1999) is an introductory level guide to many of these issues.

The following documents provide additional information on the subject matter:

- National Geospatial Data Asset Management Plan
- Content Standard for Digital Geospatial Metadata (FGDC 1998a)
- Geographic Information Framework Data Standard Part 5: Governmental Unit and Other Geographic Area Boundaries
- Geospatial Positioning Accuracy Standards Part 3: National Standard for Spatial Data Accuracy

Needs Analysis: The assessor must first evaluate the mapping needs of the jurisdiction and other stakeholders. Outside assistance may be required to perform a comprehensive needs analysis.

The following factors should be considered:

- Applicable laws, rules, regulations, and standards
- Institutional responsibilities
- Institutionalized office functions, practices, and workflows that may have been necessary in a previous or manual mapping environment but that may not be necessary in the new or digital environment
- Project timeline
- The type of finished product and technical specifications
- Existing and future resources including personnel, facilities, software, hardware, and operating systems
- Funding availability, including funding from stakeholders invested in using the data system
- Existing infrastructure
- Infrastructure required to meet the needs of stakeholders.

Digital Cadastral Map Creation: Based on the need's analysis, a digital cadastral map can be created using one of these six general methods:

- Scanned
- Scanned and georeferenced with data points
- Trace-digitized
- Best-fit-to-ortho
- COGO
- Data model

The type of digital cadastral map selected will affect quality, accuracy, maintenance, and usability. Maps created in a data model are the most sophisticated and recommended.

Scanned Maps: Existing legacy paper maps or drafting film sheets can be scanned into a raster image. These maps are inexpensive to produce, require minimal training, and can be easily accessed and shared. Maintenance and rescanning of paper maps are required for updates. Legacy maps can create maintenance difficulties and perpetuate issues such as lack of geodetic reference points and original compilation errors. For small jurisdictions, these maps may be useful as an interim solution. These maps are valuable historical records that document the end of manual map maintenance and the start of digital mapping.

Scanned and Georeferenced with Data Points: Maps can be scanned and referenced to a geodetic control network for display with other georeferenced data layers. These maps are difficult to maintain but easy to share. Paper maps must still be maintained, rescanned, and georeferenced following revisions, resulting in cumbersome workflows. Scanned maps can have a data point placed in each parcel's approximate center (centroid). Centroid attributes such as owner name, situs address, assessed value, and property characteristics can be displayed and queried.

Trace-Digitized: Maps can be created with digital polygons by tracing cadastral boundaries, from orthophotographs or hard copy maps, using a high-resolution monitor and/or a digitizing table. The resulting cadastral layer can be adequate for many appraisal, planning, and analysis functions; however, parcel boundary lines have less accurate bearing and distance attributes than those created by using COGO methods. Trace digitization methods provide the benefit that vector data (such as parcel lines) can be displayed over raster images (aerial photographs).

Best-Fit-to-Ortho: Best-fit-to-ortho is a process in which a combination of available dimensions and orthophotos evidence are used in tandem to achieve a dimensionally and spatially accurate digitized map option. The cadastralist constructs the parcel lines using available dimensions and verifies the location using ortho imagery. Typically, this approach requires a dimensional tolerance to be established as a guideline for positioning lines to match the ortho evidence. If the ortho evidence is beyond the dimensional tolerance, lines should be left as is and an error note placed for further review. If the parcel does not have any dimensions, then ortho evidence becomes the primary source for adjustment. During this process, care must be taken not to change the parcel profile as per the original source maps. This method does not provide COGO-level accuracy; however, it is considered a valid methodology and, in most cases, provides a higher level of accuracy than scanned or digitized processes. Assessors should be cautioned that ortho imagery used for this method of cadastral creation should be tied to a geodetic network of sufficient density.

Coordinate Geometry (COGO): Metes and bounds descriptions on source documents, such as deeds and plats, can be used to create parcels using coordinate geometry methods that utilize bearing, distance, and curve attributes to describe lines. Maps created using coordinate geometry provide more accurate land areas and are designed to retain bearings and distances as attributes to the parcel lines.

Data Model: The most sophisticated digital cadastral map systems use a data model that defines spatial relationships (topological rules) between different components and layers, creating an integrated suite of layers. An example would be a subdivision in which first the subdivision boundary is mapped using coordinate geometry; then blocks are mapped, which must fit within the boundary; finally, lots are mapped, which must fit within the blocks. Rules may also be set for individual parcels, which must topologically close. The publication Cadastral Core Data Set Standard is available and describes the FGDC parcel data model (Von Meyer and Stage 2007).

Technical Specifications: Specifications define technical aspects of the aerial imagery and/or digital mapping project and should include the following:

- Regulatory requirements and specifications
- Quality and quantity of the mapping products
- Layers and associated data to be delivered
- Positional accuracy requirements
- Geographic areas to be flown or mapped
- Tiling scheme for data
- Naming standards for data in adherence with state or national standards for data headings, columns, and fields
- Preliminary flight ground control establishment
- Map layers to be produced
- Data to be captured as attributes or annotation
- Sources of data to be used
- Topology rules for use in data models
- Procedures for quality control and product acceptance
- Designs for printed products and format for digital map files
- Documentation of processes
- Metadata to be provided
- Integration requirements

Assembling Source: Data The first step in creating a new digital cadastral map layer or revising an existing one should be to assemble all relevant and available information, for example:

- Geodetic control network information
- List of the parcels to be mapped
- Taxing district and municipal boundaries
- Original source documents, such as government surveys
- Railroad, highway, and utility route surveys or plats
- Subdivision, town site, township, and town plats and surveys
- Condominium and timeshare plats
- Private land surveys and associated corner records
- Most recent orthophotography
- Deed descriptions for unplatted parcels and for parcels that vary from the originally platted lot and block boundaries
- Court decisions affecting parcels to be mapped
- Planimetrically derived base map data
- Previous maps and archival images
- Other sources of information to confirm names of roads and places
- Sources of geographic names
 - National map series topographic maps, such as U.S. Geological Survey topographic quadrangles
 - Geographic name databases (e.g., U.S. Geographic Names Information System [GNIS])

Contracting for Mapping Services: Consideration should be given as to whether the new map layers will be prepared in-house or obtained from an outside source. Many assessing offices may not have the expertise or resources necessary to plan for and create digital cadastral maps and implement a digital cadastral mapping program. Other governmental agencies may be able to provide assistance. If this is not possible, the jurisdiction must either acquire experienced personnel and the necessary equipment or contract with a professional geospatial firm. Staff resources, staff training on the new product, and quality assurance mechanisms must be in place to receive and verify the delivered map product.

Mapping System Maintenance: Map and ownership data represent a substantial capital investment. Assessors must manage and maintain this investment to maintain the system's relevance. Digital cadastral map layers and ownership databases should be maintained and published in a timely manner and on a continual basis as part of the assessment roll production cycle, and they should be fully integrated into the sales review, exemption review, and assessment review and analysis functions of the assessor's office through workflow processes. Other noncadastral map layers should be maintained by the assigned data stewards in a timely manner and on a continual basis following the publication of updated cadastral data.

Ownership Maintenance: The current owner and parties of interest for each parcel should be identified. In addition, the basis of ownership (recorded deed, contract, court decree, and so on) should be documented, should cite an instrument number, record book, page, volume, and so on of the source document, and should be linked to the cadastral parcel via a unique parcel identifier. A record of prior ownership (ownership history) should be maintained. Deeds and other ownership documents should be processed within two weeks of recording. Ownership information should then be published. Procedure's manuals should provide detailed step-by-step instruction.

At a minimum, maintenance of ownership databases involves the following steps:

- Collecting all relevant deeds, trusts, judgments, contracts, plats, court cases, owner requests, and other muniments of title
- Identifying the parcels affected by these documents
- Determining the effect of the documents through an interpretation of the property description, such as a simple ownership change or a change affecting parcel boundaries through splits, combinations, property line adjustments, new subdivisions, right of takings, or other map edits
- Interacting with property owners, surveyors, attorneys, title insurance companies, and other land information professionals to resolve problems when necessary
- Entering changes in the appropriate databases
- Controlling the quality of the data
- Integrating the database. 5.2 Cadastral Layer Maintenance Procedures manuals should provide detailed step-by-step instruction; at a minimum, maintenance of the cadastral map layer involves the following steps:
 - Obtaining all relevant documents
 - Editing the database to effect changes of parcel lines, identifiers, and associated cadastral data layers
 - Editing any noncadastral data layers for which the assessor may possess stewardship
 - Performing quality control measures
 - Archiving all changes affecting parcel geometry and parcel genealogy
 - Distributing or publishing map data
 - Collecting geodetic network data points (densification) on a continual basis
 - Correcting and improving the cadastral layer when new and more accurate data become available
 - Performing daily backups of map data and periodic backups for remote site storage.

Multipurpose Map Layer Maintenance: Spatial, image, and text data for multipurpose layers comes from many sources (e.g., clerk of courts, planning, zoning, law enforcement, assessors, tax collectors, water management districts, taxing districts, emergency management agencies, fire response agencies, utility providers, public works departments) and may be used by multiple entities. Therefore, the concept of data management consortiums or data stewards is important. These collaborative groups consist of a policy-making component and a technical component to manage an intergovernmental data-sharing system. The primary entity responsible for maintaining individual multipurpose map layers must be clearly identified, as well as how the data are incorporated into a digital cadastral mapping system.

Quality Control: In both the creation and the maintenance of digital cadastral maps and ownership databases, accuracy must be ensured through adequate quality control.

Horizontal Spatial Accuracy: Digital cadastral map layers should be tested for horizontal spatial accuracy, and the results should be documented in metadata.

Map horizontal spatial accuracy is typically expressed in one of three ways:

- The National Map Accuracy Standard (NMAS) (U.S. Geological Survey 1947) for large-scale maps typically requires that 90 percent of all well-defined points on a printed map should vary no more than 1/30 of an inch from their true location. Thus, if a map is drawn or compiled at a scale of 1-inch equals 100 feet, then an easily identified point on the ground should be within 3.33 feet of its true location. The NMAS is most appropriate for paper maps that are viewed only at the printed scale. This standard would be applicable only to the digital mapping environment if accuracy was described for a particular map scale (e.g., "This map layer meets NMAS at a scale of 1-inch equals 100 feet").
- The American Society of Photogrammetry and Remote Sensing (ASPRS 1990) has developed standards that define three classes of positional accuracy, based on limiting root mean square error. The quality standard is based on full (ground) scale and is well suited to large scale base maps prepared through digital orthoimage.
- The National Standard for Spatial Data Accuracy (NSSDA) (FGDC 1998b) presents a rigorous statistical methodology for evaluating the positional error observed when a sample of well-defined map points varies from their true geospatial location. However, the standard does not provide positional accuracy thresholds; it merely provides a way of describing the accuracy of a digital map.

A major problem with any cadastral map, manual or digital, is that positional accuracy tends to vary within a single map layer. For example, in the township, range, and section environment, parcels close to a section corner may tend to be mapped more accurately than parcels in the center of a section, unless the center of section is a monumented control point. In the metes and bounds environment, parcels in a new subdivision with known monumented corners may be accurate, whereas nearby parcels described by fields, fences, creeks, and roads may tend to be less accurate. Thus, while accuracy should be field tested and documented in metadata, accuracy measures must be used judiciously; their greatest value may be in pointing to areas where additional survey work or map effort should be employed. No one accuracy standard meets all needs. In an urban environment, accuracies of one foot or less (0.30 meters) is usually desired or necessary, whereas in rural areas, it may be sufficient to specify an accuracy of eight feet (2.4 meters). Assessors should be aware that the cadastralist may not possess the equipment, skills, training, qualifications, and possibly even legal authority to conduct a field test for spatial accuracy. Assessors should consider consulting with a county surveyor or engineer or with professional geospatial firms to conduct and report on matters of spatial accuracy within their cadastre.

Quality Control Processes: In both the creation and the maintenance of digital maps, cadastralist must establish and adhere to quality control processes. Cadastral layer construction processes should be documented, adhered to, and structured to facilitate topological analysis and promote quality control and correctness at each touch point. Processes can be either manual or embedded within the software. Software should be designed and configured with built-in testing for parcel topology, data integrity, and validity; this is easier in the parcel data model environment. Assessors should be aware that add-on software that works in conjunction with mapping system software may streamline quality control. Checklists should be reviewed, tests conducted, and queries performed to ensure that all relevant documents have been gathered and properly processed and that correct ownership and map changes are reflected in the appropriate databases and map data layers. Queries should be run to identify parcels with null attributes and to identify any holes or slivers between parcels that may not be visible. Queries should be run to ensure that all parcels in tabular databases are found in the digital cadastral map layer, and vice versa. A one-to-one correlation must be maintained between parcels in tabular databases and parcels in a digital map layer. Parcel areas, as generated and stored in the parcel polygon, should be compared to areas stored in tabular databases for review and correction of significant differences. If geospatial data edits are performed by a state oversight agency, queries should be structured and run to match the edits of the state. Parcel polygons should be viewed with orthoimage and older scanned maps, if necessary, in the background to visually inspect for misregistration or areas of change. Workflows should be structured to promote accountability, timeliness of review, and coordination with tax roll production to ensure accuracy of processing.

Other Quality Control Considerations: For a cadastral map to function as a representation of the legal documents that define land title and ownership, the boundaries of parcels, lots, blocks, subdivisions, plats, government lots, land lots, land grants, and the like should be drawn as legally defined by the source document, and the map product should be capable of displaying and publishing the information.

Trimming: Many mapping program procedures include trimming of subdivision, lot, and block lines to match the ownership boundary of the parcel in situations in which an action has altered the parcel, such as when an acquisition for right-of-way purposes takes a portion of a parcel, and the parcel boundary no longer matches the original source deed, plat, block, or lot line. In these cases, the newly altered parcel should be displayed to the user and the original parcel should be archived. The practice of trimming any applicable subdivision, lot, and block lines and polygons to match the newly altered parcel is acceptable as a cadastral procedure only when the assessor also maintains the original legally defined plat, block, and lot boundaries. This practice usually requires a more complex data schema and the maintenance of multiple layers or lines for all data elements subject to trimming (a layer for the original legally defined location of the boundary and a layer for the trimmed or relocated boundary). When trimming is deemed necessary, required, or institutionally implemented, an explanation of the practice should be included in the metadata and in the map disclaimer for other users in a multipurpose environment who may rely on, or require, the location of subdivision, lot, and block boundaries as originally defined, and for the end-user of the map product. In the digital environment in which the cadastralist or other geospatial technician has the ability to easily control, share, view, and publish individually desired data layers or elements, the practice of trimming is unnecessary and weakens the validity of the cadastral map product as a representation of the legal source documents and the confidence level of the user. Extreme prudence should be exercised when the practice of trimming is used.

Parcel Area and Dimensioning: Caution should be exercised when parcel area data are published. A parcel may have multiple areas:

- System generated
- Surveyed
- COGO
- Deeded
- PLSS sectional breakdown

A parcel attribute table may store all these areas. Great caution should be used in publishing the deeded area because of potential discrepancies. For example, a PLSS sectional breakdown parcel may be described in a deed as being ten acres (660 feet x 660 feet). However, thirty feet may have been taken from one side for right-of-way; rendering the parcel to be only 9.54 acres (most attorneys and title companies will continue to use the description from the chain of title even in such cases), and the system-generated area based on the proportional breakdown of the section can produce a completely different (third) area.

Metadata should define the areas, and any area measurement published on a map product should be defined and distinguishable as to the type of area (system, surveyed, COGO, deeded, or sectional) for the end user. It is not recommended to publish only one type of area and exclude all others. For example, it is not recommended to publish only those parcels with a deeded area and exclude from publication areas determined by COGO, areas surveyed, areas from PLSS sectional breakdown, or areas only known to be system generated. Doing so presents an incomplete picture of the work of the assessor and could deprive end users of desired information. It is recommended the assessor provide the user with parcel table data containing all stored areas, rather than graphically labeling a parcel area through attribution or annotation, unless the source of the area is clearly indicated in the attribution or annotation and defined for the user. Parcel boundary lines should be attributed or annotated with distance data when known from recorded documents such as plats, deeds, and right-of-way maps or from private documents such as land surveys prepared by licensed professionals. Private surveys should be copied and filed or scanned and stored. Any distance data, either attributed or annotated, that is not known by document and is generated by the mapping system software should be noted as such for the end user.

Edge-Matching to Adjacent Jurisdictions: Both the assessor and cadastralist must recognize that cadastral data in a multipurpose environment are shared among users and agencies that compile cadastral data on a multijurisdictional, state-wide, and national level for a variety of uses. One such use is analysis during disasters such as wildfires or weather events such as hurricanes. Events such as wildfires and hurricanes do not stop at township or county lines. State emergency managers and the Federal Emergency Management Agency (FEMA) compile cadastral data for events spanning numerous jurisdictions. Cadastral data should edge-match as coincident lines and polygons between adjacent jurisdictions to facilitate these types of uses. Another use of coincident jurisdictional polygons is state-wide analysis. Geospatial analysis using parcel data is performed by state property tax oversight agencies, economic and demographic research agencies, and state universities. The assessor and cadastralist should work with adjacent jurisdictions to review all parcels along their township or county boundaries. Monumented points shared by multiple jurisdictions should be agreed upon and adhered to in the geodetic network and cadastral data so that no gaps or overlaps exist between each agency's respective cadastral polygons. This will also ensure no land is omitted from assessment or double assessed among the jurisdictions.

Parcel Discrepancies: Digital cadastral layers (subdivision, lot, block, parcel) of individual parcels or groups of parcels often have gaps, overlaps, closure errors, or nonconformity compared to ground occupation. Decisions on addressing such discrepancies should be based on the following:

- Mapping and boundary law, such as principles of junior and senior rights, priority of 'calls' in a property description, latent error verses patent error, water boundaries, and adverse possession
- Surveying techniques and technology, such as the need to rotate descriptions to a common basis of bearing
- Land division systems affecting the jurisdiction, such as the evolving PLSS and/or Spanish, French, Dutch, or English colonial practices (Price 1995) in North America
- Capabilities and limitations of the software being employed, such as the ability to snap, extend, trim, generalize, adjust closure by compass rule, and use of topological rules
- Intent of the description
- Good judgment and common sense.

The goal should be to produce a final cadastral map product with seamless polygons. Gaps or overlaps between parcels should not be displayed. Parcel polygons should not overlap, creating a double assessment, either real or perceived, and no gaps should exist between jurisdictions, creating a situation whereby land escapes assessment. The assessor or mapper should bring significant parcel discrepancies to the attention of the property owner, the attorney or title company, or other party involved in the property conveyance, private surveyors, and if necessary, the county surveyor for resolution. Discrepancies should be documented and include recommendations from the cadastralist on how to address the issues and reasons for the visual display of the parcels to the public. Documentation should include annotations attached to points, lines, or areas on the map and stored in a data layer specifically for such a purpose. 7. Parcel Identifiers Parcels in a digital cadastral map layer must be linked to assessment data. The key link between parcels and tabular data is the parcel identifier (also referred to as the PIN (parcel identification number) or the PID (parcel ID). A PIN or PID can consist of numbers, alpha characters, code(s), or combinations thereof to identify one parcel. For the purpose of this standard, PIN is used. The PIN should be defined and recognized as the official reference to all documents or data for each parcel. All jurisdictions in a state or province should use the same primary system of parcel identification. Various secondary identifiers also may be used to index parcel data; however, all the secondary identifiers must be cross-indexed to the PIN.

Desirable Characteristics: Many formats of parcel identifiers are in use. Whether in use or proposed, a PIN should be judged based on six attributes: compliance with standards, uniqueness, permanence, simplicity and ease of use, ease of maintenance, and flexibility.

Compliance with Standards: If a state, regional, or local parcel identifier format has been adopted, a jurisdiction should follow it. In addition, various national PIN formats have been proposed (PRIA 2003), but not yet mandated. In the United States, at the federal level, the National Academy of Science suggests a national parcel number could simply add an appropriate Federal Information Processing Standards (FIPS) code, developed by the National Institute of Standards and Technology, to the front of each jurisdiction's existing PINs (National Academy of Science 2007). In 1995, the FGDC Cadastral Subcommittee developed the Cadastral Data Content Standard for National Spatial Data Infrastructure (2008), which identifies parcel core data useful to many stakeholders and suggests that this information be captured and maintained by assessors. The core data elements are described in the Appendix.

Uniqueness: Uniqueness is the most important attribute of a PIN. Ideally, there should be a one-to-one relationship between a parcel and its identifier. This relationship may not be achievable because of assessment limitations caps, taxing district boundaries, tax increment financing areas (TIFs), and physically divided single-use properties, among other situations.

Permanence: Parcel identifiers should be permanent and changed only when necessary, such as when the boundaries of a parcel change.

Simplicity and Ease of Use: Parcel identifiers should be easy to use and understand with as few digits as possible. A parcel identifier that is uncomplicated and easily understood helps to reduce errors in its use.

Ease of Maintenance: The parcel identification system should be easy to maintain and should efficiently accommodate changes, such as the subdivision or consolidation parcels.

Flexibility: The parcel identification system should be reasonably flexible. It should be capable of serving a variety of uses, not only land parcels but also multistory condominiums, subsurface rights, air rights, easements, leases, and so on.

Types of Parcels: Identifiers There are five basic types of parcel identifiers, described as follows. The first two types, which incorporate clues to a parcel's geographic location, are recommended for assessment purposes.

Geographic Coordinate System Identifiers: The geographic coordinate system is a method of locating a point on the Earth's surface based on its distance from each of two intersecting grid lines known as x and y axes. These grid lines can be based on latitude and longitude, the Universal Transverse Mercator (UTM) system, or state plane coordinates. Parcel identifiers using this system comprise the coordinates for a single point, usually the parcel centroid. Parcel identifier systems based on geographic coordinates are easy to maintain, because new numbers are quickly assigned by picking parcel centroids. They are easy to use in the field because the PIN can help locate the parcel when a global positioning system (GPS) is used. These PINs meet the desired characteristic of uniqueness. However, geographic coordinate-based PIN's may not meet the criteria of simplicity because a complete parcel identifier could be a lengthy numeric character string containing x, y, and z coordinates. The z coordinate is required for multi-story condominiums and apartments, where parcels at various levels could have the same x-y centroid. The elevation problem could also extend to subsurface parcels, such as underground parking or mineral rights. In addition, the desired characteristic of permanence can be problematic. Assessors should be aware that minor map edits, corrections, or adjustments can alter the x, y, and possibly z coordinates of the parcel centroid, thereby breaking the link with the number stored in tabular databases and undermining the permanence aspect. An alternative to the centroid may be the use of coordinates associated with a separate point or label within each parcel polygon. Points or labels are less likely to have their x and y locations altered due to minor edits of the parcel polygon.

Rectangular Survey System Identifiers: This system of parcel numbering is based on section/ township/range systems such as the PLSS. Parcel identifiers based on a rectangular survey system are developed by using the section/township/range, quarter-section, and quarter-quarter-section numbers, along with individual parcel identifiers assigned to each tract or subdivided lot and block. This kind of PIN provides an approximate geographic location of each parcel that is easy to understand and maintain and meets the criteria of uniqueness and permanence; however, it is not applicable in geographic locations not subject to the PLSS.

Map-Based System Identifiers: This system is based on the incorporation of the cadastral map into the parcel identifier. This PIN consists of a map (or page) number, block (or group) number, and parcel location as numbered within a block or group of parcels. For example, a PIN of 32-02-16, indicates 32 represents the map on which the parcel is found, 02 the block on the map, and 16 the parcel location within the block. Map-based identifiers may reference a geographic area and are convenient for use with printed maps in the field. However, they have limited usefulness in the digital cadastral mapping environment in which the map exists in a seamless environment rather than as individual map sheets.

Name-Related Identifiers: Name-related identifiers use the names of individuals claiming an interest to a parcel as the parcel identifier. A common example of this is the use of name codes in the grantor-grantee index. Use of such identifiers is discouraged because they do not meet the criteria of permanent reference to geographic location, and ease of use.

Assignment and Maintenance of Parcel Identifiers: PINs established in accordance with the guidance in this section should be assigned to all parcels during the initial phase of a digital cadastral mapping program. These PINs should be considered provisional until the mapping program has been completed and all maps have been formally approved. The assessor should maintain parcel identifiers, ownership information, and property descriptions as new parcels are created. Two methods exist for the process of maintaining parent and child parcels when existing parcels are being divided (split) or combined (joined). One method is to retire or delete the PIN of the existing parent parcel that has been divided or split into two or more child parcels. The other method is to retain the original PIN of the parent parcel and to assign a new PIN to each new child parcel. Both methods exist because of system configurations, workflows, and other processes tied to the PIN. Such other processes include researching the history of a PIN, retaining assessment limitations or caps, or base-values in the case of TIFs. Both methods are acceptable when applied consistently. However, once a PIN has been retired, it should not be reused unless absolutely required by the parcel-numbering schema limitations.

Notations should exist in the parcel record regarding its reuse. A review of the records should be performed to ensure there are no outstanding taxes or liens on the retired PIN before its reuse. Parcel identifiers should change only when the geometry of the parcel changes due to the subdivision of the parcel, the consolidation of two or more parcels, the 17 recordation of a plat affecting the parcel, or other governmental actions affecting parcels or the property descriptions of parcels, such as the vacating of a recorded plat. The assessor should notify the property owner(s) when a change to a PIN occurs. This is especially important given the Dodd-Frank Wall Street Reform and Consumer Protection Act, which addresses the listing of a PIN on mortgage documents in which real property is being pledged. Documentation of the change should be maintained in the assessor's notes or digital cadastral mapping system.