



**Mass Appraisal
Report
For Tax Year 2018**

Tarrant Appraisal District

2018 Mass Appraisal Report

OVERVIEW OF TARRANT APPRAISAL DISTRICT

Scope of Responsibility

The Tarrant Appraisal District has prepared and published this mass appraisal report to provide our citizens and taxpayers with a better understanding of the district's appraisal responsibilities and activities as they relate to the mass appraisal of real and personal property in Tarrant County. When mass appraisal techniques are employed, the Chief Appraiser is required to prepare and certify a mass appraisal report at the conclusion of the appraisal portion of the property tax calendar. It is the intent of this report to identify the analysis, data, appraisal techniques and methodologies, valuation conclusions and statistical testing that make up the annual mass appraisal efforts of Tarrant Appraisal District.

Texas appraisal districts are required by law to use appraisal methodology and procedures in the appraisal of property for ad valorem tax purposes that comply with the Texas Property Tax Code, as well as the Uniform Standards of Professional Appraisal Practice (USPAP). The 2018 Tarrant Appraisal District Mass Appraisal report references the 2018 - 2019 edition of the Uniform Standards of Professional Appraisal Practice (USPAP) as established by the Appraisal Standards Board of The Appraisal Foundation, authorized by the United States Congress as the source of appraisal standards and appraiser qualifications. The purpose of USPAP is to promote and maintain a high level of public trust in appraisal practice by establishing requirements for appraisers. USPAP contains ten standards that establish the requirements for appraisal, appraisal review and appraisal consulting services and identify the methods for reporting the results of each activity.

USPAP Standards 5 and 6 specifically establishes the requirements for the development and communication of a mass appraisal. Mass Appraisal is defined as the process of valuing a group of similar properties as of a given date using standard methodology, employing common data, and allowing for statistical testing. This is accomplished with standardized data collection procedures, specification and calibration of mass appraisal models, tables and schedules. Ratio study analysis and other performance measures are then used to test appraisal uniformity and accuracy. USPAP Standard 6 defines the requirements for a mass appraisal written report. The standard states that reports should clearly communicate the elements, results, opinions and value conclusions of the mass appraisal effort.

The Tarrant Appraisal District (TAD) is a political subdivision of the State of Texas created effective January 1, 1980. The provisions of the Texas Property Tax Code govern the legal, statutory, and administrative requirements of the appraisal district. The appraisal district is responsible for appraising property for ad valorem purposes. A five-member board of directors, appointed by the taxing units within the boundaries of Tarrant County, constitutes the district's governing body. The Tarrant County

Tax Assessor-Collector is the only elected official on the board and serves as a nonvoting director. The chief appraiser, appointed by the TAD board of directors, is the chief administrator and chief executive officer for the appraisal district.

It is the responsibility of the board to approve the appraisal district budget, adopt general policies and appoint a taxpayer liaison officer for the district and a chairperson and a secretary of the Appraisal Review Board. The board of directors does not have the authority to value property or administer exemptions. Rather to ensure adherence with generally accepted appraisal practice, the board is responsible for the adoption of a biennial written plan for the reappraisal of all property within the CAD boundaries. For 2018, TAD is operating under the guidelines established in the 2017-2018 Reappraisal Plan.

Effective as of September 1, 2007, the Tarrant Appraisal District boundaries are the same as the county's boundaries. TAD is responsible for local property tax appraisal and exemption administration for the seventy-three jurisdictions or taxing units located in Tarrant County.

Each taxing unit, such as the county, a city, school district, municipal utility district, etc., sets its own tax rate to generate revenue to pay for such things as police and fire protection, public education, road and street maintenance, courts, water and sewer systems, and other public services. The purpose of appraisal district property appraisals is to establish values that are used by the taxing units to calculate and allocate the annual tax burden. The taxing units are the intended primary user of the appraisal records. The Texas Property Tax Code contains statutes that guide the administration of property tax laws in Texas. For the most part, the tax code defines the scope of work required for local property tax appraisals. Appraisals are based on each property's worth or market value, unless otherwise specified. TAD also administers and determines eligibility for various types of property tax exemptions that are authorized by State and local governments; such as those for homeowners, the elderly, disabled persons, disabled veterans, and charitable or religious organizations.

Tarrant Appraisal District attempts to comply with all requirements of the Texas Public Information Act. This Act gives the public the right to request access to government information. TAD maintains a website in order to make appraisal information more readily accessible. The public can search for account level property data, view parcel maps and print a number of forms and applications. The site also includes several reports that summarize 2018 appraised value and exemption information for each taxing unit. The TAD website address is www.tad.org.

A property taxpayer, whether residential or commercial, is responsible for paying taxes and has a reasonable expectation that the taxing process will be fair. A citizen board, called the appraisal review board (ARB), settles any disagreements between a property owner and the appraisal district. In a county with a population of 120,000 or more, the members of the board are appointed by the local administrative-district judge.

A property owner can protest any appraisal district action that impacts the property's tax liability. In 2017, property owners or their representatives filed approximately 135,000 protests. Protests for 2018 have just exceeded 148,000 but property owners have up until January 31st or their specified tax

delinquency date to continue to file motions regarding 2018 valuation and clerical error issues. Hearings for these and any subsequent protests will occur periodically throughout the remainder of the year.

In Texas, all real and tangible business personal property located in the State's jurisdiction is taxable unless exempt by law. Taxable property is appraised annually at its "market value" as of January 1st except as otherwise provided by the Property Tax Code. Under the tax code, "market value" means the price at which a property would transfer for cash or its equivalent under prevailing market conditions if:

- exposed for sale in the open market with a reasonable time for the seller to find a purchaser;
- both the seller and the buyer know of all the uses and purposes to which the property is adapted and for which it is capable of being used and of the enforceable restrictions on its use, and;
- both the seller and buyer seek to maximize their gains and neither is in a position to take advantage of the exigencies of the other.

The Property Tax Code further defines special appraisal provisions for the valuation of residential homestead property (Sec. 23.23), land designated for agricultural use (Sec. 23.41), real property inventory (Sec. 23.12), dealer inventory (Sec. 23.121, 23.124, 23.1241 and 23.127), nominal (Sec. 23.18) or restricted use properties (Sec. 23.83) and allocation of interstate property (Sec. 23.03). Section 23.12 also provides for an alternative appraisal date of September 1st for owners of real property inventory and certain types of business personal property inventory.

The Texas Property Tax Code, under Sec. 25.18, requires each appraisal office to implement a plan to update appraised values for real and personal property at least once every three years. The district's current policy is to conduct a general reappraisal of real and business personal property value every year, meaning that a property's appraised value is established and reviewed for equality and uniformity on an annual basis. The district makes every effort to conduct a periodic onsite field review of real property and an annual field review or verification of personal property.

The appraised value of real and business personal property is calculated using specific information and data about each property. Using computer-assisted mass appraisal (CAMA) programs, and generally recognized appraisal methods and techniques, registered and trained appraisers compare the subject property information with the data for similar properties, and with recent market data. The district adheres to 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. Chapter 23 of the Texas Property Tax code contains statutes dealing with appraisal methods and procedures. Section 23.01 of this chapter was amended in 1997 to specify that appraisal districts are required to comply with the mass appraisal standards of USPAP (Standards Five & Six) when the appraised value of a property is established using mass appraisal techniques. 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.

Personnel Resources

The Office of the Chief Appraiser is primarily responsible for overall planning, organizing, staffing, coordinating, and controlling all district operations. The district is organized into six primary departments: Administration, Support Services, Information Services, Residential Appraisal, Commercial Appraisal and Business Personal Property Appraisal. A director leads each department.

The Administration Department's function is to plan, organize, direct and control the business support functions related to human resources, budget, finance, records management, purchasing, fixed assets, facilities maintenance and mail services.

The Support Services Department has four divisions that perform various functions including land management, customer service, exemptions administration and imaging. The Information Services Department consists of various divisions that maintain TAD's Information Services infrastructure and GIS data.

Three separate appraisal departments are responsible for the valuation of all real and business personal property. The Residential Department includes residential appraisal, research and an agricultural land valuation section. The Commercial Department has four work divisions: commercial real property appraisal, complex property appraisal, and commercial research/reporting and litigation/arbitration. Business Personal Property Appraisal includes personal property, utilities, mineral appraisal and research. The 2018 and 2019 adopted budget provides information for TAD employee positions and classifications.

All appraisal district appraisers are subject to the provisions of the Property Taxation Professional Certification Act and must be duly registered with the Texas Department of Licensing and Regulation (TDLR). This agency is responsible for ensuring appraisers are professional, knowledgeable, competent and ethical. TDLR administers a statewide program of registration, education, experience, testing and certification for all property tax appraisers as specified by law. The Texas Comptroller's Property Tax Assistance Division is responsible for approving the actual appraisal coursework. Appraisers must be in strict compliance with the TDLR standards of professional practice, conduct, education, and ethics. The agency can deny, suspend, or revoke the registration of an appraiser who performs in an unprofessional manner or violates any provisions of the Appraiser Certification Act.

Additionally, all appraisal personnel receive extensive, on-the-job training in data collection and valuation methodology. Standardized manuals are provided to ensure uniform and accurate data collection. Senior personnel provide on-the-job data collection training both in the office and out of the office. Managers meet regularly with staff to introduce new procedures and regularly monitor appraisal activity to ensure that all personnel are following standardized appraisal methods and techniques.

As provided for in the 2018 adopted budget, the appraisal district staff consists of employee positions with the general following classifications:

- Executive/Administration Group (Executive Director, Department Directors, Administration, Payroll and Finance Specialists, Appraisal Review Board Support)
- Information Services Group (Division Managers, Programmers, Data Services, Web Site Specialists, CAMA Product Management, GIS Specialists)
- Appraisal Group (Managers, Supervisors, Analysts, Appraisers, Valuation Technicians)
- Support Services Group (Supervisors, Customer Service Representatives, Exemption Specialists, Deed Records Specialists)
- Clerical/General Office Group (Supervisors, Secretaries, General and Data Service Clerks, Imaging Specialists)
- Labor/Trades Group (Custodians, Facility Supervisor)

Data

U.S. Census Bureau statistics for 2018 indicate that Tarrant County had an estimated population of 2,054,475. This represents a 13+% increase in population since 2010 or approximately 1.6% growth per year. The county has a total area of 897 square miles, comprised of 864 square miles of land and 39 square miles (4.32%) of water. For 2018, the district was responsible for establishing and maintaining approximately 1,763,000 real property and 49,000 business personal property accounts located within the boundaries of Tarrant County. This represented a gain of 266,000 parcels from 2017 to 2018. Mineral valuations account for approximately 1,100,000 of the real estate accounts. Mineral accounts are created when a property owner has a producing mineral interest in an oil or gas well.

Appraisal records contain information related to property characteristics, ownership and exemption status. Accurate ownership data is maintained by processing recorded deeds and plats that are provided by the Tarrant County Clerk's office. Exemption data is developed in conjunction with various application requirements as stipulated in the Property Tax Code.

Relevant property characteristic data is collected and maintained through on-site field reviews that are conducted as part of the 2017-2018 Reappraisal Plan. Existing property characteristics are verified or updated per field data collection procedures. Property data related to new construction and other building permit activity is collected during the annual field effort. Each city within TAD's jurisdiction provides permit and certificate of occupancy information either electronically or in paper form. Comparable sale and income data is also routinely validated as part of the building permit field review and reappraisal activities. Other methods of data collection and maintenance include aerial photography, private and published sale sources, newspaper articles, various real estate related websites, and information from property owners.

General demographic, economic and financial trends, construction costs, and market sales and income data are acquired through various sources. These may include internally generated questionnaires to

buyer and seller, public and university research centers, private market data vendors, real estate related publications and telephone contact with buyers, sellers, brokers and fee appraisers. The appraisal departments have appraisal staff assigned to research functions and they are responsible for collecting this type of data.

The district has a geographic information system (GIS) that maintains cadastral maps and includes various layers of data, including parcel lines, FEMA flood data, zoning, jurisdictional boundaries and aerial photography. The district's website makes a broad range of information available for public access, including detailed information on appraisal district operations. The public can also access online information, from TAD's website, that includes property characteristics data, certified values, protests and appeal procedures, property maps, and a tax calendar. Downloadable files of related tax information and district forms, including exemption applications, and business personal property renditions are also available on the website.

Information Services Support

The Information Services Department (IS) provides direct support for all operating departments involved in appraisal functions, customer service, exemption administration and the Appraisal Review Board support activities. Server data is also utilized to fulfill all the reporting requirements for the taxing units and the State Comptroller's Property Tax Assistance Division.

Independent Performance Test

According to Chapter 5 of the TPTC and Section 403.302 of the Texas Government Code, the State Comptroller's Property Tax Assistance Division (PTAD) is required to conduct a biennial property value study (PVS) of each Texas school district within each appraisal district. As a part of this annual study, the code also requires the Comptroller to: use sales and recognized auditing and sampling techniques; review each appraisal district's appraisal methods, standards and procedures to determine whether the district used recognized standards and practices (MAP review); test the validity of school district taxable values in each appraisal district and presume the appraisal roll values are correct when values are valid; and, determine the level and uniformity of property tax appraisal in each appraisal district. The methodology used in the property value study includes stratified samples to improve sample representativeness and techniques or procedures of measuring uniformity. This study utilizes statistical analysis of sold properties (sale ratio studies) and appraisals of unsold properties (appraisal ratio studies) as a basis for assessment ratio reporting. For appraisal districts, the reported measures include median level of appraisal, coefficient of dispersion (COD), the percentage of properties within 10% of the median, the percentage of properties within 25% of the median, and price-related differential (PRD) for properties overall and by state category (i.e., categories A, B, C, D and F1 are directly applicable to real property).

There are twenty-one independent school districts in the Tarrant Appraisal District for which appraisal rolls are annually developed and tested. The preliminary results of this study are released in January in

the year following the year of appraisal. The final results of this study are certified to the Education Commissioner of the Texas Education Agency (TEA) in the following July of each year for the year of appraisal. This outside (third party) ratio study provides additional assistance to the CAD in determining areas of market activity or changing market conditions.

For 2018, Tarrant Appraisal District was subject to a MAP (Methods, Assistance, and Procedures) review by the Property Tax Assistance Division. House Bill 8, effective Jan. 1, 2010, amended Tax Code Section 5.102 to require the Comptroller of Public Accounts to review county appraisal district (CAD) governance, taxpayer assistance, operating standards and appraisal standards, procedures and methodology at least once every two years. HB 8 also amended Government Code Section 403.302 to change the frequency of the property value study for school districts from every year to every other year.

The MAP review contains nine scores. The first five are based on mandatory requirements. An appraisal district must pass all mandatory requirements for the school districts in the county to be eligible for "grace period" determinations and local value assignments to the Texas Education Agency.

Appraisal Activities

INTRODUCTION

General Appraisal Responsibilities

Tarrant Appraisal District appraisal responsibilities are divided between three appraisal departments; residential, commercial and business personal property. The residential appraisal department is organized into three divisions: Data Research, Data Collection and Data Quality. The department also contains an agricultural land appraisal section. The commercial appraisal department consists of four divisions: commercial (real property) appraisal, complex properties/abatements, commercial research, and litigation/arbitration. The Business Personal Property division has an appraisal and research section. TAD contracts with an outside firm to handle mineral valuations and it is managed by the BPP division.

In both the residential and commercial department, the appraisal staff is responsible for collecting and maintaining property characteristic data for classification, valuation, and information processes. Accurate valuation of real and personal property by any method requires a physical description of personal property, land, and building characteristics. An effective data collection effort involves the regular field inspection of all real and personal property accounts. It is the goal of TAD appraisal departments to periodically complete a thorough, on-site field review, for residential and commercial properties. Business personal property data is field checked or verified every year. Meeting this goal is dependent on budgetary constraints, workload and staffing levels.

Appraisal Resources

- **Personnel** - Tarrant Appraisal District appraisal activities are accomplished with a staff of appraisers and clerical support personnel. These employees are assigned to a specific appraisal department; however many staff appraisers have experience and knowledge in the mass appraisal of all categories of property.
- **Data** - Existing property characteristic data, for the residential appraisal staff, the commercial appraisal staff and the business personal property staff, is contained in a CAMA (Computer Assisted Mass Appraisal) system that operates within the Aumentum product. All appraisers are currently provided with a laptop or a hand-held pen pad computer in order to verify existing property characteristics, record changes to property data and collect new data. Existing data from the Aumentum system, along with TAD GIS maps (with ortho-photography) can be accessed with these devices. Other field inspection resources may include MAPSCO street directories, sales and income data, fire damage reports, private water and electrical service applications, building permits, building plans, site plans, photos and actual cost information.

PRELIMINARY ANALYSIS

Data Collection/Validation

Data collection of real property involves entering and maintaining data characteristics of the property in the Aumentum system. The information contained in these systems includes specific land and improvement characteristics such as deeded land size, building size, square foot of living area, year built, quality of construction, and property condition. Appraisers in the commercial and residential appraisal departments use standardized appraisal classification manuals, developed by Tarrant Appraisal District, to establish uniform procedures for the correct listing of real property components. All properties are coded according to these manuals and the approaches to value are structured and calibrated based on this coding system. The appraisers are given instruction for use and application of the manual during their initial training. The manual serves as a resource guide in the field inspection of properties. Data collection for personal property also involves maintaining information in the Aumentum system. The type of information contained in Aumentum for personal property includes inventory, furniture and fixtures, machinery and equipment, cost and location. The field appraisers conducting on-site inspections are instructed on how to use a personal property manual during their initial training and as a guide to correctly identify and list all taxable business personal property.

The property classification manuals that are utilized by the appraisal departments are available in the district offices. Manuals are also located in the customer service area for public inspection. Upon request, a property owner/agent may purchase a copy of a property classification manual. The contents of the manuals are periodically reviewed by research staff in each appraisal department and updated as warranted.

Sources of Data

The sources and methods of data collection include the following; new construction/building permit field effort, property inspections during a scheduled reappraisal cycle, data mailers, informal and formal appeals hearings, residential and commercial sales collection and verification, newspapers and publications, and property owner's written correspondence or phone contact. A critical source of data comes from building permits received from taxing jurisdictions that require property owners to take out a building permit. As permits are issued by an entity, a copy is collected by the appraisal district, generally on a monthly basis. The permits are then matched to the appropriate real estate account and set up for a field inspection by either the commercial or the residential appraisal department. The commercial appraisal staff also collects business personal property data as part of the field inspection procedure.

In residential appraisal, an on-site review of entire neighborhoods is generally a good source for data collection. Appraisers drive entire neighborhoods to review the accuracy of the existing data and verify appropriate application of the appraisal classification manual. The commercial and business personal property appraisal staff works together to verify the accuracy of both personal and real property data during each annual reappraisal cycle. Changes or additions to a property are also noted during this process. The sales collection effort in real property appraisal pertains to the collection and verification of data for properties that have recently sold. In residential, this effort involves on-site inspection by field

appraisers to both verify the accuracy of the property characteristics data and confirm the sales price. In the commercial appraisal department, the commercial research section is responsible for verification of sales and other relevant model-driven data.

Property owners are one of the best sources for identifying incorrect data that generates a field check. Frequently, the property owner provides enough documentation to allow correction of records without having to send an appraiser on-site. As the district has increased the amount of information available on the Internet, property owner's requests to correct data inconsistencies has also increased. As a result, staff appraisers are involved in this type of fieldwork on a year-round basis.

Data Collection Procedures

Field data collection requires organization, planning and supervision of the field effort. Property specific, standardized data collection procedures have been established for all residential, commercial, and personal property. Management teams in each appraisal department plan for and coordinate appraisal resources to accomplish all necessary field data collection. Appraisers are generally assigned specific areas to conduct field inspections and are trained in the appropriate manner to record information on a field collection document.

The quality of the data used is extremely important in establishing accurate values of taxable property. While production standards are established and upheld for the various field activities, quality of data is emphasized as the goal and responsibility of each appraiser. New appraisers are trained in the specifics of data collection as specified in the appraisal classification manual. Experienced appraisers receive routine training on standardized department procedures prior to major field projects such as new construction, sales validation or data review. A quality assurance process exists through supervisory review of the work performed by the field appraisers. Quality assurance supervision includes the responsibility of ensuring that appraisers follow manual and training procedures, identifying training issues and providing uniform training throughout the field appraisal staff.

Data Maintenance

Residential appraisers enter appraisal changes into the Aumentum (CAMA) software. Entry screens are standardized and formatted to insure uniform processing of the information. All data entry work completed in this area is sent by workflow to the residential support staff for data quality control. In addition, management and quality control specialists produce edit and audit reports on a continual basis for review. These reports are written to identify potential data entry errors and review appraisal field collection results.

The commercial appraisal staff is responsible for the data entry of most commercial appraisal related change directly into the Aumentum system. The software application is highly standardized and contains numerous up-front data entry edits to prevent potential data entry errors. Additional quality control of the data occurs through the production and review of various edit and audit reports. Commercial supervisors, managers and the data management staff all participate in this quality control effort.

The business personal property division has a clerical staff that is responsible for entry of BPP appraisal changes during the data collection phase along with preliminary entry of rendition data. The appraisal staff then completes rendition processing during the valuation phase of the appraisal cycle. The personal property staff also reviews numerous post-entry edits to verify the quality and accuracy of all BPP data and information.

DATA REVIEW PROCEDURES

Field Review

Every year, a field review of certain geographic areas or neighborhoods in the jurisdiction is completed during the district's annual reappraisal effort. In addition, field inspections are scheduled based on permit activity or when a property owner identifies an error in TAD's physical characteristics data. The date of last inspection, extent of that inspection, and the TAD appraiser number are listed in the CAMA property record. Property owners sometimes dispute district data in ARB hearings or during the informal appeals process. When documented and supported, the property record may be modified based on the evidence provided by the owner. However, a field inspection may be warranted to verify this evidence for the current year's valuation or the appraisal department may code the property for a field review for the next year's valuation.

Office Review

Edit and audit reports are generated on a continual basis to review the accuracy and uniformity of all field collected data. Appraisal managers review appraiser paperwork and conduct on-site field checks to ensure accuracy and uniform application of department standards as described in the appraisal classification manual.

PERFORMANCE TEST

Appraisal managers, supervisors and research staff are responsible for conducting ratio studies and comparative analysis. Ratio studies are conducted on property located within certain neighborhoods or districts by appraisal staff. The sale ratio and comparative analysis of sale property to appraised property forms the basis for determining the level of appraisal and market influences and factors for the neighborhood. This information is the basis for updating property valuation for the entire area of property to be evaluated. Field appraisers, in many cases, may conduct field inspections to insure the accuracy of the property descriptions at the time of sale for this study. This inspection is to insure that the ratios produced are accurate for the property sold and that appraised values utilized in the study are based on accurate property data characteristics observed at the time of sale. Also, property inspections are performed to discover if property characteristics had changed as of the sale date or subsequent to the sale date. Sale ratios should be based on the value of the property as of the date of sale not after a subsequent or substantial change was made to the property after the negotiation and agreement in price was concluded. Properly performed ratio studies are a good reflection of the level of appraisal for the district.

Appraisal managers and research section specialists are responsible for conducting ratio studies and comparative analysis. (Refer to the individual valuation process summary reports). Field appraisers, in many cases may conduct field inspections to insure the ratios produced are accurate and the appraised values utilized are based on accurate property data characteristics.

Residential Valuation Process

INTRODUCTION

Scope of Responsibility

The residential appraisal staff appraisers are responsible for developing equal and uniform market values for improved and vacant residential property. There are approximately 558,000 residential improved parcels and 45,000 vacant residential properties in Tarrant County.

Residential appraisal assignments are delineated from commercial assignments on the basis of state use code, established by the Property Tax Assistance Division of the State Comptroller. Generally, the residential staff values residential single family, multifamily housing (other than apartments), vacant residential lots, improvements on rural acreage, open-space & agricultural appraisal, mobile homes and residential inventory properties.

Appraisal Resources

- **Personnel** - The Residential Appraisal staff consists of appraisers and support staff. A detailed count may be found in the 2017 and 2018 adopted budgets.
- **Data** - A common set of data characteristics for each residential dwelling in Tarrant County is collected in the field and entered to the CAMA system. This property-specific data drives the TAD computer-assisted mass appraisal (CAMA) approaches to valuation. Residential appraisal also utilizes verified sales data, construction cost data, and data from other real estate sources. Appraisers may also review real estate related publications to determine patterns and trends in the market data.

VALUATION APPROACH (Model Specification)

Land Analysis

Residential land analysis is conducted by the residential managers and analysts prior to neighborhood sales analysis. From these land analyses, land models are developed to determine a primary land rate. Specific land adjustments may be applied, where necessary, to account for characteristics of a neighborhood or a specific parcel. Parcels outside the neighborhood norm for characteristics such as view, shape, size, and topography, among others may also be adjusted. When available data exist, appraisers may use the comparable sales data, allocation by abstraction or allocation by ratio methods to insure that the land values developed best reflect the contributory market value of the land to the overall property value.

Area Analysis

Data on regional economic forces such as demographic patterns, regional location factors, employment and income patterns, general trends in real property prices and rents, interest rate trends, availability of vacant land, and construction trends and costs are collected from private vendors and public sources and provide the appraisers a current economic outlook on the real estate market. Information is gathered from real estate publications and other outside sources including seminars, conferences, and continuing education courses approved by the Texas Comptroller's Office.

Residential Neighborhood and Market Analysis

TAD's residential market areas are defined by thorough analysis of homogenous geographic areas. The analysis consists of the examining of how physical, economic, governmental and social forces and other influences affect property values within these areas. The effects of these forces are also used to identify, classify, and stratify comparable properties into smaller, manageable subsets of the universe of properties known as neighborhoods. (See Appendix D for a listing of all neighborhoods defined by the Residential Appraisal Division). Analysis of comparable market sales data forms the basis of estimating market activity and the level of supply and demand affecting market prices for any given market area, neighborhood or district. Market sales reflect the effects of these market forces and are interpreted by managers into an indication of market value ranges for a given neighborhood. Sales also provide an indication of property component changes considering a given time period relative to the date of appraisal. Although all three approaches to value are considered, residential sales can best be interpreted and applied using two generally accepted appraisal techniques known as the cost and market or comparable sales approach. For low density, multiple family properties, the income approach to value may also be utilized, in the absence of recent sales data.

The first step in neighborhood analysis is the identification of a group of properties that share certain common traits. A "neighborhood" for analysis purposes is defined as a geographic grouping of properties where the property's physical, economic, governmental and social forces are generally similar and uniform. Geographic stratification takes into consideration the local supply and demand factors that vary across a jurisdiction. Once a neighborhood with similar characteristics has been identified, the next step is to define its boundaries. This process is known as delineation. Some factors used in neighborhood delineation include location, sales price range, lot size, age of dwelling, quality of construction and condition of dwellings, square footage, and story height. Delineation can involve the physical drawing of neighborhood boundary lines on a map, but it can also involve statistical separation or stratification based on attribute analysis. Part of neighborhood analysis is the consideration of discernible patterns of growth that influence a neighborhood's individual market. Few neighborhoods are fixed in character. Each neighborhood may be characterized as being in a stage of growth, stability or decline. The growth period is a time of development and construction. As new neighborhoods in a community are developed, they compete with existing neighborhoods. An added supply of new homes tends to induce a population shift from older homes to newer homes. In the period of stability, or equilibrium, the forces of supply and demand are about equal. Generally, in the stage of equilibrium, older

neighborhoods can be more desirable due to their stability of residential character and proximity to the workplace and other community facilities. The period of decline may reflect diminishing demand or desirability. Declining neighborhoods may also experience renewal, reorganization, rebuilding, or restoration, which promotes increased demand and economic desirability.

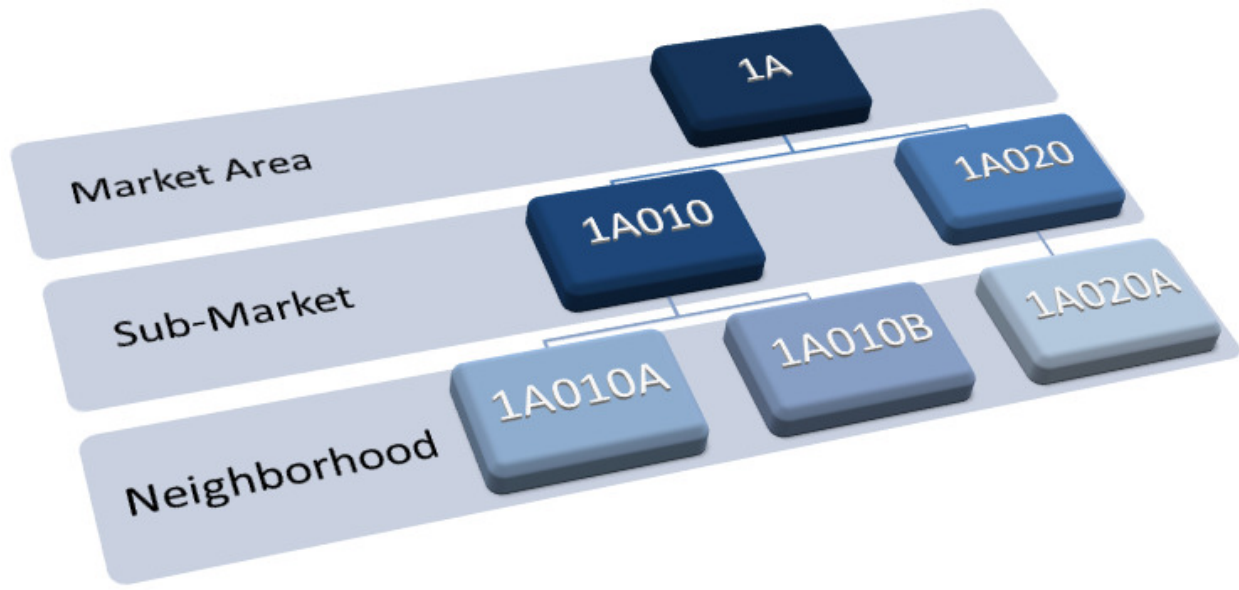
Neighborhood identification and delineation is the cornerstone of the residential valuation system at the district. Most residential analysis work, in association with the residential valuation process, is neighborhood specific. Neighborhoods are visually inspected to verify delineations based on observable aspects of homogeneity. Neighborhood delineation is periodically reviewed to determine if further neighborhood specification is warranted. Whereas neighborhoods involve similar properties in the same location, a neighborhood group is simply defined as similar neighborhoods in similar locations. Each residential neighborhood is assigned and coded to a neighborhood group based on observable aspects of homogeneity between the areas. Neighborhood grouping is highly beneficial in cost-derived areas of limited or no sales and in direct sales comparison analysis. Defining comparable neighborhood groups serves to increase the available market data by linking comparable properties outside a given neighborhood. Sales ratio analysis, discussed below, is performed at the market area, sub-market area, and/or neighborhood areas, and in soft sale areas on a comparable neighborhood group basis.

The Residential Appraisal Section evaluates all residential properties during the biennial sales ratio study. Problem market areas identified by the study are scheduled for field inspections.

Field inspections are also scheduled for properties identified through various other sources including but not limited to; the informal appeals and appraisal review process, building permits, owner request, sales information verification and annual canvas of one third of all residential properties in the district.

Residential Neighborhood Hierarchy

Neighborhoods define an area of complimentary land uses in which all properties are similarly influenced by the four forces affecting property value: environmental (physical), governmental, social, and economic forces. The area of the neighborhood will contain complimentary land uses. The three types of boundaries are natural, political, and manmade.



Market Areas define a group of appraisal sites for which the market factors are similar. These similarities then assist with fair & equitable valuation utilizing the various models in the CAMA system.

Sub-Market Areas are appraisal sites that can be assigned to a market area. Sub Market areas exist within a market area and define a group of appraisal sites within that market area that are more similar to each other than other appraisal sites in a market area. These similarities then assist with fair & equitable valuation utilizing the various models in the CAMA system.

Neighborhood Areas define a group of appraisal sites that are more similar to each other than other appraisal sites within the same market and sub market areas. These similarities then assist with fair & equitable valuation utilizing the various models in the CAMA system.

Market Areas, Sub-Market Areas, & Neighborhood Areas are assigned to every residential property and may be viewed graphically on District maps.

Highest and Best Use Analysis

The highest and best use of property is the most reasonable and probable use that supports the highest present value as of the date of the appraisal. The highest and best use must be physically possible, legally permissible, financially feasible, and productive to its maximum. The highest and best use of residential property is generally its current use. This is due in part to the fact that residential development, in many areas, through use of deed restrictions and zoning, precludes other land uses. Residential valuation undertakes reassessment of highest and best use in transition areas and areas of mixed residential and commercial use. In transition areas with ongoing socio-economic and cultural changes, the residential and commercial appraisal staff

reviews the existing residential property use and makes a determination regarding highest and best use. Once the conclusion is made that the highest and best use remains residential, further highest and best use analysis is done to decide the type of residential use on a neighborhood basis. As an example, it may be determined in a transition area that older, non-remodeled homes are not the most productive or profitable use, and the highest and best use of such property is to demolish the old homes and construct new dwellings. In areas of mixed residential and commercial use, the appraiser reviews properties on a periodic basis to determine if changes in the real estate market require reassignment of the highest and best use of a select category of properties.

In November 2009, the Texas constitution was amended to limit the analysis of highest and best use on a residence homestead. If a residential property is homesteaded, appraisers are to appraise the property in its current use and disregard the properties highest and best use or the value associated with highest and best use. This change became effective on 01/1/2010.

VALUATION AND STATISTICAL ANALYSIS (Model Calibration)

Cost Schedules

The district's residential cost schedules are derived from Wayne Moore's Precision Cost Tables (developed from Craftsman rates a nationally recognized cost estimator) and utilize a Floor Stratified Cost Model, which are reviewed and adjusted periodically to reflect the local market.

Possible adjustments for factors that may inhibit value are also in table form and are applied uniformly to any properties affected. Examples may include cracked slab, termite damage, repairs needed, etc.

The District considers all three approaches to value and recognizes the cost approach as an acceptable approach. Generally, for residential property, the district considers the market approach a more viable and accurate indicator and utilizes the market approach, in conjunction with the cost approach, to arrive at a final estimate of market value.

Income Models

The income approach to value may be utilized for those real properties that are typically viewed as income producing, when sufficient income data is available and where comparable sales are not present. In the current residential market, the income approach is not generally used.

Sales Information

A sales file for the storage of snapshot sales data for vacant and improved properties at the time of sale is maintained for residential real property. Residential improved and vacant sales are collected from a variety of sources, including: district survey letters sent to buyers and sellers, field

discovery, protest hearings, Board of Realtor’s MLS and other sales vendors, builders, and realtors and brokers. The following chart identifies the historic and projected numbers of sales that are received and processed annually by the residential research staff.

	2013	2014	2015	2016	2017	2018	2019
Multiple Listing Service (MLS)	22,853	24,459	23,944	25774	28,500	26,211	25,000
Other Sources	1,736	1,211	1,149	1697	1,721	299	1,500
Total Sales	24,589	25,670	25,093	27471	26,500	26,500	26,500 Projected

A system of type, source, validity and verification codes has been established to define salient facts related to a property’s purchase or transfer and to help determine relevant market sale price information. The effect of time as an influence on price can be considered by paired sales analysis and applied in the ratio study to the sales as indicated within each neighborhood area. Neighborhood sales reports are generated as an analytical tool for the managers in the development and estimation of market price ranges and property component value estimates. Abstraction and allocation of property components based on sales of similar property is an important analytical tool to interpret market sales under the cost and market approaches to value. These analytical tools help determine and estimate the effects of change, with regard to price, as indicated by sale prices for similar property within the current market.

Multiple sales of the same property are considered and analyzed for any indication of price change attributed to a time change or influence and monthly time adjustments are developed. Property characteristics, financing, and conditions of sale may be compared for each property sold in the pairing of property to isolate only the time factor as an influence on price.

Section 23.013 of the Property Tax Code addresses the “Market Data Comparison Method of Appraisal”. During the 2009 Legislative session, Section 23.013 subsection (b) was added to specify that sales used in the market data comparable method should occur within 24 months of the appraisal date, unless too few sales occurred to produce a representative sample for a certain type of property. Subsection (c) was added to require appraisal districts to appropriately adjust comparable sales for changes in the market value of the sales based on the sale date and subsection (d) includes a list of property characteristics to be considered in determining comparability between a sale and a subject property. These changes became effective on January 1, 2010.

Statistical Analysis

The residential department performs statistical analysis annually to evaluate whether values are equitable and consistent with the market. Ratio studies are conducted on residential neighborhoods in the district to judge the two primary aspects of mass appraisal, accuracy and

uniformity of value. Appraisal statistics of central tendency and dispersion generated from sales ratios are available for each neighborhood and are summarized by year. These summary statistics including, but not limited to, the weighted mean, median, standard deviation, coefficient of variation, and coefficient of dispersion provide a tool by which to determine both the level and uniformity of appraised value on a neighborhood basis. The level of appraised values is determined by the mean, weighted mean, and/or median to develop an adjustment factor for individual properties within a neighborhood. Review of the standard deviation, coefficient of variation, and coefficient of dispersion discerns appraisal uniformity within and between neighborhoods.

Residential management and staff, through the sales ratio analysis process, review neighborhoods annually. The first phase involves neighborhood ratio studies that compare the recent sales prices of neighborhood properties to the appraised values of these sold properties. This set of ratio studies affords the reviewer an excellent means of judging the present level of appraised value and uniformity of the sales. Based on the sales ratio statistics and designated parameters for a valuation update, a preliminary decision is made as to whether the value level in a neighborhood needs to be updated in an upcoming reappraisal, or whether the level of appraised value is acceptable. The residential department performs statistical analysis annually to evaluate whether estimated values are equitable and consistent with the market.

Reconciliation and Valuation

Neighborhood, or market adjustment, factors are developed from appraisal statistics provided from ratio studies and are used to ensure that estimated values are consistent with the market. The district's approach to the valuation of residential properties is a cost-market approach. This approach accounts for neighborhood market influences not particularly specified in a purely cost model. The following equation denotes the hybrid model used:

$$MV = ((MA \times RCN) - D) + LV$$

The market value (MV) equals the market adjustment factor (MA) applied to the replacement cost new (RCN) less depreciation (D), plus the land value (LV). Market adjustments will be applied uniformly within neighborhoods to account for location variances.

Statistical analysis of current appraised values of a neighborhood or market area, as compared with recent sales in the same or similar neighborhood or market area, determines the appropriate market adjustment for a neighborhood. The CAMA system aids with the study and determination of market trends and to develop appropriate market adjustments.

SPECIAL APPRAISAL PROVISIONS

Appraisal of Residential Homesteads

Article VIII, Sec. 1 (i) of the Texas constitution allows the legislature to limit the annual percentage increase in the appraised value of residence homestead to 10% under certain conditions. This limitation is commonly referred to as a homestead capped value. Sec.23.23 of the Tax Code implements the cap on increases in value. The limited value begins in the second year the property qualifies for a residential homestead exemption. The appraised value of a qualified residence homestead will be the lesser of:

- (1) the market value of the property for the most recent tax year that the market value was determined by the appraisal office; or
- (2) the sum of:
 - (A) 10 percent of the appraised value of the property for the preceding tax year;
 - (B) the appraised value of the property for the preceding tax year; and
 - (C) the market value of all new improvements to the property

Since TAD is on an annual reappraisal cycle, the limited appraised value must be recomputed annually. The appraised value of a homestead may increase 10% annually or until the appraised value is equal to the market value. If a limited homestead property sells, the cap automatically expires as of January 1st of the year following the sale of the property and the property is appraised at its market value. The market value of a limited homestead is maintained, as well as the limited appraised value.

Residential Inventory

Section 23.12 of the Texas Property Tax Code provides the definition of market value for inventory. Inventory includes residential real property that has never been occupied as a residence and is held for sale in the ordinary course of trade or business, provided that the residential real property remains unoccupied, is not leased or rented, and produces no income.

Residential inventory is appraised at market value. The market value of residential inventory is the price at which it would sell as a unit to a purchaser who would continue the business. The residential appraisal staff applies the same generally accepted appraisal techniques to determine the market value of residential real property inventory.

Agricultural Appraisal

The Texas Constitution permits certain kinds of agricultural land to be appraised for tax purposes at a productivity value, rather than at market value. This special appraisal value is based solely on the land's capacity to produce agricultural products. Property qualifying for agricultural appraisal will have a substantial reduction in taxes, based on the difference in special agricultural appraisal and the market value of the property. Property taxes are deferred until a change of use of the property occurs or, in a much less frequently requested type of special agricultural appraisal, when

the ownership changes. At the time of use or ownership change, taxes are recaptured for up to five previous years, based on the difference in what was paid based on agricultural appraisal, and what would have been paid based on the market value of the property. Procedures for implementing this appraisal are based on the guidelines published in the Manual for the Appraisal of Agricultural Land, printed April 1990. A copy may be obtained from the State Comptroller of Public Accounts.

Application Process

The State Property Tax Code requires an application before land is considered for agricultural valuation. The deadline for filing a timely application is before May 1. Late agricultural valuation applications may be filed up to the time the appraisal roll is certified, however a penalty is imposed for late filing. After an application is filed, the property is inspected to determine its qualification.

Three criteria must be met when determining qualification.

Use - Land must be currently devoted principally to agricultural use.

Degree of Intensity - The agricultural use must be to the degree of intensity generally accepted in the area.

History of Use - The land must have been devoted principally to agricultural use for five (5) of the preceding seven (7) years. Land located within an incorporated city or town must have been devoted principally to agricultural use continuously for the preceding five (5) years.

When the land's use qualifications have been reviewed, one of three actions will be taken.

Application is Denied – Property owner is notified by certified mail and given 30 days to appeal the decision to the Appraisal Review Board.

Application is Approved - Property owner is notified of the decision and the productivity land appraised value. Once approved, the property remains valued as a special agricultural use until a change of use occurs, or the ownership changes. If the property's use remains unchanged and only ownership has changed, the new owner is notified and is required to timely apply for special agricultural valuation.

Disapprove the Application and Request More Information - The application is disapproved and the applicant is allowed thirty days to provide additional information, otherwise the application is denied. When requested information is provided, it is added to data already collected to arrive at a final decision.

INDIVIDUAL VALUE REVIEW PROCEDURES

Field Review

The appraiser identifies individual properties in need of field review through examples such as: sales ratio analysis, ARB hearings, building permits, property owner's requests, aerial photography and other sources. Sold properties are reviewed on a regular basis to check for accuracy of data characteristics before they are used in reappraisal analysis.

As the district's parcel count has increased through new home construction, and existing home remodeling, the appraisers are required to perform associated field activity. Increased sales activity can result in a more substantial field effort on the part of the appraisers to review and reconcile sales that fall outside acceptable ranges. Additionally, the appraisers frequently field review data items such as quality of construction, condition, and physical, functional and economic obsolescence, factors contributing significantly to the market value of the property. The following chart contains historical and projected permit activity for residential property.

	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>
NEW HOMES	5,270	4,197	6,160	6,897	6,920	7,327	7,000
OTHER PERMITS	10,154	8,808	8,900	9,537	9,650	11,997	11,000
TOTAL	15,424	13,005	15,060	16,434	16,570	19,324	18,000 Projected

Office Review

A routine valuation review of all properties as outlined in the discussion of ratio studies and market analysis is conducted. Previous values resulting from protest hearings, informal negotiation, arbitration, or litigation are individually reviewed to determine if the value remains appropriate for the current year.

Once the residential appraisal staff is satisfied with the level and uniformity of value for each neighborhood and/or market area, the estimates of value are prepared for a notice of proposed value.

PERFORMANCE TESTS

Sales Ratio Studies

The primary analytical tool used by the residential appraisal staff to measure and improve performance is the sales ratio analysis. The district ensures that the appraised values produced meet the standards of accuracy in several ways. Overall, sales ratios are generated for each neighborhood to allow the residential appraisal staff to review general market trends within their

area of responsibility, and provide an indication of market change over a specified period. The neighborhood descriptive statistic is reviewed for each neighborhood being updated for the current tax year. Finally, other sales ratios statistics are produced. Residential appraisers may use sales up to two years prior to January 1st of the appraisal year to obtain a statistically valid sample.

Management Review Process

Once the proposed value estimates are finalized, the appraisal managers review the sales ratios by neighborhood and present pertinent valuation data, such as weighted sales ratio and pricing trends to the Director of Residential Appraisal and the Chief Appraiser for final review and approval. This review includes comparison of level of value between related neighborhoods within and across jurisdiction lines. The primary objective of this review is to ensure that the proposed values have met preset appraisal guidelines appropriate for the tax year in question.

Commercial Valuation Process

INTRODUCTION

Appraisal Responsibility

The commercial (real property) appraisal department is responsible for the valuation of all commercial real property, including land and improvements, located within the boundaries of the Tarrant Appraisal District's jurisdiction. For 2018, this included approximately 12,500 vacant parcels, 31,000 improved parcels and 16,500 commercial properties with a tax-exempt status. Commercial real property types generally include multi-family, office, retail, warehouse/manufacturing and various other categories of business related facilities. The staff appraisers also value all commercial and rural land parcels. In general terms, the commercial appraisal staff is responsible for the establishing market value on any real property for which the highest and best use is determined to be non-residential.

In 2014, Tarrant Appraisal District implemented a new computer assisted appraisal system known as Aumentum for the purpose of storing, retrieving, analyzing data and executing the three recognized approaches to value.

Commercial appraisal assignments are kept delineated from residential assignments based on state code guidelines, established by the State Property Tax Division. Generally, the commercial staff handles B1, C2, C3, E category (land portion only), and all F category properties. Residential properties located in areas of transition to commercial, or interim-use properties, are also valued by the commercial division. If the interim-use property does not have a residential homestead exemption, the property data and valuation models, for these accounts, are maintained by the commercial division. Otherwise, the records are maintained in the residential system, for purposes of calculating the 10% limitation on increases to the appraised value for a property with a general residential homestead exemption. A description of these state codes is provided in the appendix.

Commercial appraisers are required to value the fee simple interest of properties according to statute. However, the affect of easements, restrictions, encumbrances, leases, contracts or special appraisal provisions are considered on an individual basis, as is the appraisalment of any non- exempt taxable fractional interests in real property (i.e. certain multi-family housing projects). Fractional interests or partial holdings of real property are appraised in fee simple for the whole property and divided programmatically based on their prorated interests.

Appraisal Resources

Personnel - The real property portion of the commercial appraisal department is organized into three separate divisions or areas of responsibilities. The three divisions include commercial appraisal, complex properties/abatements and commercial research. Each division is staffed with a manager,

appraisers and a clerical support staff. Each division manager reports to the Director of Commercial Appraisal.

A separate litigation division also resides within the commercial department structure. This staff consists of a manager, a senior litigation appraisal specialist, two appraiser analysts, and two clerks. They are responsible for appraisal review and a myriad of other activities as they relate to residential and commercial lawsuits and arbitration motions filed against Tarrant Appraisal District.

- **Commercial Appraisal Division**

The commercial appraisal division is staffed with two managers and sixteen appraisers. Each appraiser is assigned to a workgroup or team that is supervised by a manager. In addition, six clerks and one clerical supervisor are assigned to support all three divisions in the commercial department.

Commercial improved property is categorized according to the major property types including multi family, office, retail, industrial/manufacturing and various other categories of business-related uses. The commercial appraisal staff also values commercial and rural (non-residential) vacant land parcels. The north team handles the valuation of industrial and office-related categories and all commercial land located in the northern portion of TAD's jurisdiction. The south team is responsible for multi-family and retail-related categories and land located in southern portion of TAD's jurisdiction. The manager for each region is responsible for assigning geographic land areas of responsibility to each appraiser. Appraisers are also given the task of completing a field review for all permits issued in their designated area.

- **Research Division**

The research division consists of a manager, six appraisers and two clerks. This section is primarily responsible for collecting, processing, and maintaining sales and income information that is used in the valuation process. After the information is processed and verified, the sales and income information is entered into and stored in database tables. The database tables are integrated within the valuation models. The information is easily accessible for the appraisers to use in the sale model building and calibration process, edit process, informal discussions, and appraisal review board hearings. Land sales data is processed and posted to appraisal maps which are also accessible through the MARS Geographic Information System (GIS) application.

The research division is responsible for updating and maintaining the commercial classification manual. This process includes the periodic review and calibration of cost data contained in the CAMA system. The research staff is also responsible for monitoring and implementing new or revised appraisal methods and techniques in order to stay proficient with current appraisal technique and maintain compliance with USPAP Standard Six. An extensive resource library is maintained and includes commercial real estate and financial publications, published survey data, on-line appraisal data sources, appraisal educational textbooks and software, periodicals and journals, comptroller's reports and various other resources to assist the appraisal process.

- **Complex Properties Division**

The complex properties division consists of a manager and three appraisers. This section is responsible for valuing complex and unique properties as well as processing abatements. The complex and unique properties consist of golf courses, utilities, railroads, high-rise downtown office buildings, regional and local airports, shopping malls, hospitals, and possessory interest properties. Special properties also monitor properties located within designated Tax Increment Financing (TIF) areas. The higher profile complex properties that have a tremendous impact on the North Texas economy include the Dallas Cowboys Stadium, The Ballpark at Arlington, Hurricane Harbor, Six Flags, DFW Airport, American Airlines, General Motors, and Gaylord Texan Resort.

Data - A common set of data characteristics for each commercial property in Tarrant County is collected in the field and data entered in Aumentum. This property-specific data drives the three approaches to value. Additional required data includes verified sales of vacant land and improved properties and the pertinent data obtained from each (sales price levels, capitalization rates, income multipliers, equity dividend rates, marketing period, etc.). Other data used by the appraiser includes sale listings, fee appraisals, actual income and expense data (typically obtained through the hearings process), actual contract rental data, leasing information (commissions, tenant finish, length of terms, etc.), and actual construction cost data. In addition to the actual data obtained from specific properties, market data publications and published market surveys are also reviewed to provide additional support for market trends.

PRELIMINARY ANALYSIS

Prior to beginning of the valuation activities for an appraisal year, appraisal department management completes a thorough review of the results of the preceding year. Goals and objectives are determined and managers establish a plan of action. Budget, calendar issues and resource availability are all considered. Appraisal activities must be coordinated between TAD departments to avoid conflicts and ensure availability of personnel. Appraisal resources, including staff and system needs are evaluated. Appraisal Review Board activity and value changes in the informal appeals process are analyzed. Most importantly, a preliminary internal ratio study is produced to identify any property category or geographic area that may require more research or analysis. The appraisal staff works with the research section to identify priority areas for sales data collection and any necessary enhancements to the standardized appraisal classification manual.

Tarrant Appraisal District also coordinates its discovery and valuation activities with adjoining Appraisal Districts. Numerous field trips, interviews and data exchanges with adjacent appraisal districts are conducted to ensure compliance with state statues. In addition, Tarrant Appraisal District administration

and personnel interact with other assessment officials through professional trade organizations including the International Association of Assessing Officers, Texas Association of Appraisal Districts and its subchapter Texas Metropolitan Association of Appraisal Districts and the Texas Association of Assessing Officers.

VALUATION APPROACH (Model Specification)

Area Analysis

Data on regional economic forces such as demographic patterns, regional locational factors, employment and income patterns, general trends in real property prices and rents, interest rates, discount rates, and financing trends, availability of vacant land, and construction trends and costs are collected from private vendors and public sources. Key appraisers and managers analyze the data and meet regularly to discuss how these factors and trends could impact the local real estate market. More detailed analysis is then completed to determine what model recalibration and specification will need to occur during the upcoming valuation cycle.

As part of a continuing education process, appraisers and managers regularly attend local and statewide seminars and workshops that cover these related topics. Appraisers are also required complete a series of appraisal related courses to achieve and maintain knowledge in the application of general and specific data throughout the valuation process.

Neighborhood (Submarket) Analysis

A commercial neighborhood, submarket or economic area is comprised of the land and the commercial properties located within the boundaries of a specifically defined geographic location. A market area consists of a wide variety of both competing and complimentary property types including residential, commercial, industrial and governmental. Market area delineations can be based on man-made, political, or natural boundaries. Submarket analysis involves the examination of how physical, economic, governmental and social forces at the local, national and international level influence or affect property values. The effects of these forces are used to determine the highest and best use for a property, and to select the appropriate sale, income and cost data in the valuation process.

Improved and land market areas are defined for each of the various improved property types (apartment, office, retail, warehouse and special use) based upon a qualitative and quantitative analysis of similar economic or market forces. These include but are not limited to similarities of rental rates, quality of overall buildings or projects (known as building rank by area commercial market experts), date of construction, levels of market activity and competition, supply and demand, submarket stability, city ordinances, availability of infrastructure and other pertinent influences. Economic area identification and delineation by each major property use type is a key component in a mass-appraisal, commercial valuation system. All income and sales comparison valuation models are specific. Economic areas are periodically reviewed to determine if redelineation is required.

Highest and Best Use Analysis

The highest and best use is the most reasonable and probable use that generates the highest present value of the real estate as of the date of valuation. The highest and best use of any given property must be physically possible, legally permissible, financially feasible, and maximally productive. It is that use that will generate the highest net return to the property over a period of time. For vacant tracts of land within a jurisdiction, the highest and best use is considered speculative but market-oriented and is based on the surrounding land uses in a competing land market area. The appraiser must consider the most probable use that is permitted under local administrative regulations and ordinances. While its current zoning regulation may restrict a property's use, the appraiser may also consider the probability that the zoning could be changed.

For improved properties, highest and best use is evaluated as currently improved and as if the site were still vacant. In many instances, the property's current use is the same as its highest and best use. However, the appraiser may determine that the existing improvements have a transitional use, interim use, nonconforming use, multiple uses, speculative use, excess land, or a different optimum use, if the site were vacant. Improved properties reflect a wide variety of highest and best uses which include, but are not limited to: office, retail, apartment, warehouse, light industrial, special purpose, or interim uses. Proper highest and best use analysis insures that the most accurate estimate of market value can be derived. Market value is also referred to as value in exchange.

Value in use represents the value of a property to a specific user for a specific purpose. An example of value in use is agricultural or productivity value. The Texas Property Tax Code has specific provisions for certain categories of property that require a value based on a specific use. This value is significantly different than market value, which approximates market price under the following assumptions: (i) no coercion of undue influence over the buyer or seller in an attempt to force the purchase or sale, (ii) well-informed buyers and sellers acting in their own best interests, (iii) a reasonable time for the transaction to take place, and (iv) payment in cash or its equivalent.

Appraisal Site

An appraisal site consists of a property or grouping of properties recognized by the market as a single unit. An appraisal site requires common ownership and physical contiguity with natural or geographic boundaries and may contain one or more TAD accounts. In addition, the highest and best use is most probable, and would sell, as one property. A commercial appraiser determines an appraisal site as part of the highest and best use analysis. The appraiser creates an Appraisal site record by identifying the account numbers and other required data as indicated in the commercial classification manual. Commercial appraisers make market value determinations at both the account or "parcel" level and the Appraisal Site or "property" level.

Market Analysis

A mass-appraisal market analysis relates directly to economic market forces affecting supply and demand that affect a group of similar or "like" properties. This study involves the relationships between

social, economic, environmental, governmental, and site conditions. Appraisers consider such general market data as submarket supply and demand, zoning and code restrictions, municipal services, school district characteristics, crime rate patterns, job growth patterns, income levels, population trends, transportation issues, interest rate levels, investment patterns and a myriad of other factors that influence the local real estate market.

Specific market data is gathered and analyzed including sales of commercial properties, new construction and other permit activity, new leases, lease rates, absorption rates, vacancies, typical property expenses (inclusive of replacement reserves), expense ratio trends, and capitalization rate indicators.

DATA COLLECTION / VALIDATION

Data Collection/Appraisal Manuals

The Commercial Appraisal Classification Manual is the main resource used for data collection and documentation of physical property characteristics. The commercial manual is used to establish uniform procedures for the correct listing of real property by field appraisers. This manual is continually updated, providing a uniform system of listing the multitude of field data elements necessary to describe commercial real properties. All commercial properties located in TAD's jurisdiction are coded or described according to the manual and the three approaches to value are structured and calibrated based on this coding system. The field appraisers use the manuals during their initial training and as a guide in the field inspection of properties. Most of the data collection options are represented in Aumentum through a series of drop-down selection lists. Field data lists, codes and table rates are reviewed periodically for update as needed.

The commercial manual also provides the framework for the commercial cost model. The Aumentum CAMA system is integrated with a Marshall & Swift Valuation Platform or MVP and is used by the appraisal staff to calculate dependable building cost estimates for all types of commercial properties.

Actual construction cost data is also collected and analyzed. Property owners generally provide this data during the appeals process.

Standardized codes are developed and used to describe commercial property at both the parcel and the economic unit level. For example, one key characteristic of a property, at the parcel level, is building class. This is similar to the Marshall and Swift component called "occupancy class". An appraisal site, however, may be comprised of multiple building classes. An appraisal site is coded using a site class description that reflects the predominant economic use for the entire property.

Commercial sales data is collected, verified and processed by the commercial research staff. A standardized workflow procedure is followed to track and accurately process the documents. The sale data items are preliminarily reviewed and verified to determine reliability of the content and the source.

Some preliminary sale information is then entered in the Aumentum sales tracking system, using the Tarrant County deed filing's instrument number as a key field. After entry into the tracking system, the staff then assembles and records detailed information about each sold property. The sale detail includes capturing a "picture" of each appraisal site and parcel as of the date of the sale. Physical, geographic and financial data is documented and entered in the Aumentum sale entry record. A final quality control review of the written and entered data occurs and the sales data is then released to the appraisers and to the public for the purpose of mass appraisal valuation. Sales can be viewed in Aumentum individually, in the data entry module, or as part of a model-driven sales summary grid in the sales comparison module. The paper documentation for all processed sale and income information is maintained in the TAD imaging system. The research department processed 473 valid sales with a 2018 deed date.

Income and expense data consists of property rent rolls and income statements and is generally provided by property owners during the appeals process. The appraisal staff forwards the data to the research section where it is immediately scanned into image-processing workflow basket. In 2018, the research department received 2,877 income and expense statements. The data is retrieved by appraisers and processed into the Aumentum income and expense tables. The district also subscribes to several real estate publications that provide individual summarized income data within each specified submarket or improved market area. Pertinent income data includes rental rates, asking rental rates, vacancies, tenant reimbursements, operating expenses, capitalization rates, discount rates, lease up projections, and finish out costs.

Around May 1 of each year, the bulk of commercial value notices are mailed, and sales and income data is made available at TAD's customer service area on CD-ROM disks. Land sales are identified and recorded on CAD maps using a mapping software product called ARC-INFO. A full set of color-printed maps and a printed copy of each land sale are also provided to the customer service area. All sale and income information and land sales maps are also available on the TAD website.

Sources of Data

Closing statements, cost documents, rent rolls and income statements provided by owners during the appeals and ARB process are considered the most reliable sources of property data. Another reliable source of verified sales and income data is the local fee appraiser community. Networking with others in the appraisal profession benefits the overall quality and credible application of the data.

The Tarrant Appraisal District records division receives a copy of the deeds recorded in Tarrant, Dallas, Denton, Johnson, Parker, and Ellis County that convey commercially classed properties located within the TAD jurisdiction. When a deed involving a change in commercial property ownership is entered into the TAD system, a set commercial survey letters are produced. One letter is mailed to the buyer and one to the seller, in an attempt to obtain the pertinent sale information. Tarrant Appraisal District also subscribes to CoStar, a private vendor of commercial sale and property data, and to the Multiple Listing Service (MLS). Other sales sources are contacted such as the brokers involved in the sale, property managers, commercial real estate vendors, or other knowledgeable parties.

VALUATION ANALYSIS (Model Specification and Calibration)

The commercial appraisal system consists of mass appraisal applications of the sales comparison, cost, and income approaches to value. The applications were developed based on economic theory, market analysis, and generally accepted appraisal techniques. Each approach to value represents a specified model or formula that defines property characteristics and their relationships in an effort to arrive at an indication of market value for a given property. The final value is a reconciliation of all three approaches to value.

Model calibration involves the process of periodically adjusting the mass appraisal formulas, tables, and schedules to reflect current local market conditions. Three valuation models are utilized in the mass appraisal process; cost, income and sales comparison models. The software developed to create the valuation models has been specified according to appropriate mass appraisal procedures and techniques. On an annual basis, adjustments or calibrations can be made to reflect new construction procedures, materials and/or costs, new submarket delineation, current sale and rent data, and market capitalization rates, which can vary from year to year. The basic structure of the overall mass appraisal model can be valid over an extended period of time, with recalibration or trending factors utilized for updating the data to the current market conditions. However, at some point, if the adjustment process becomes too involved, the model calibration technique can mandate new model specifications or a revised model structure.

Cost Models/Schedules

The formula for a cost driven valuation model begins with an estimate of replacement cost new (RCN) for all improvements (buildings, fencing, paving etc.) on a parcel of land. Three forms of depreciation are considered and subtracted from the RCN to result in an estimate of value for the improved portion of the real estate. The sales comparison approach is typically the most reliable method to value the underlying land. An overall value is then computed by adding the depreciated value of the improvements to the value of the land.

The cost approach to value is applied to all improved real property utilizing the comparative unit or square foot method. This methodology involves the utilization of national cost data reporting services as well as consideration of actual cost information on comparable properties whenever possible. Cost estimates are made in the Cama System using the integrated MVP platform. Cost models include the derivation of replacement cost new (RCN) of all improvements. These include comparative base rates, per unit adjustments and lump sum adjustments. Time and location modifiers are necessary to adjust cost data to reflect conditions in a specific market and changes in costs over a period of time. Because a national cost service is used as a basis for the cost models, locational modifiers are necessary to adjust these base costs specifically for Tarrant County. The MVP platform provides these modifiers.

Depreciation schedules are contained in the integrated MVP Platform and are based on what is typical for each property type at that specific age. Depreciation schedules have been implemented for what is typical of each major class of commercial property by economic life categories. Schedules have been developed for improvements with 15, 20, 30, 40, 50, 60 and 70 year expected life. The research

section, to ensure they are reflective of current market conditions, then tests these schedules, using sales of relatively new properties. The actual and effective ages of improvements are noted in Aumentum. Effective age estimates are based on the utility of the improvements relative to where the improvement lies on the scale of its total economic life and its competitive position in the marketplace. Effective age estimates are based on 5 condition ratings that relate to the level of property maintenance and are described in the Commercial appraisal classification manual.

A depreciation adjustment model can be used if the condition or effective age of a property varies from the norm by appropriately noting the physical condition and functional utility ratings on the property data characteristics. These adjustments are typically applied to a specific property type or location and can be developed via ratio studies or other market analyses. Accuracy in the application of the MVP, condition ratings and integrated depreciation schedules will usually minimize the necessity of this type of an adjustment factor.

Income Models

The income approach to value is applied to those real properties which are typically viewed by market participants as “income producing”, and for which the income methodology is considered a reliable leading value indicator. The first step in the income approach pertains to the estimation of market rent on a per unit basis. This is derived from an analysis of both actual rent data furnished by property owners and from market rent derived from comparable properties. This per unit rental rate multiplied by the number of units or net rentable area results in the estimate of potential gross rent. Actual income data is entered and stored in the Aumentum income module.

A vacancy and collection loss allowance is the next item to consider in the income approach. The projected vacancy and collection loss allowance is established from actual data furnished by property owners and on local market publications. This allowance accounts for periodic fluctuations in occupancy, both above and below an estimated stabilized level. The market derived stabilized vacancy and collection loss allowance is subtracted from the potential gross rent estimate to yield an effective gross rent.

Next a secondary income or service income is calculated as a percentage of stabilized effective gross rent. Secondary income represents parking income, escalations, reimbursements, and other miscellaneous income generated by the operations of real property. The secondary income estimate is derived from actual data collected and available market information. The secondary income estimate is then added to effective gross rent to arrive at an effective gross income.

Allowable expenses and expense ratio estimates are based on a study of the local market, with the assumption of prudent management. An allowance for non-recoverable expenses such as leasing costs and tenant improvements are included in the expenses. A non-recoverable expense represents costs that the owner pays to lease rental space. Different expense ratios are developed for different types of commercial property based on use. For instance, retail properties are most frequently leased on a triple-net basis, whereby the tenant is responsible for his pro-rata share of taxes, insurance and common area maintenance. In comparison, a general office building is most often leased on a base

year expense stop. This lease type stipulates that the owner is responsible for all expenses incurred during the first year of the lease. However, any amount in excess of the total per unit expenditure in the first year is the responsibility of the tenant. Under this scenario, if the total operating expense in year one (1) equates to \$8.00 per square foot, any increase in expense over \$8.00 per square foot throughout the remainder of the lease term would be the responsibility of the tenant. As a result, expense ratios are implemented based on the type of commercial property.

Subtracting the allowable expenses from the effective gross income yields an estimate of net operating income.

Rates and multipliers are used to convert income into an estimate of market value. These include income multipliers, overall capitalization rates, and discount rates. Each of these is used in specific applications. Rates and multipliers also vary between property types, as well as by location, quality, condition, design, age, and other factors. Therefore, application of the various rates and multipliers must be based on a thorough analysis of the market.

The Aumentum CAMA software provides the ability to perform the direct capitalization valuation approach. This methodology involves the capitalization of a stabilized net operating income as an indication of market value for a specific property. Capitalization rates, both overall (going-in) cap rates for the direct capitalization method and terminal cap rates for discounted cash flow analyses, can be derived from the market. Sales of improved properties from which actual income and expense data are obtained provide a very good indication of what a specific market participant is requiring from an investment at a specific point in time. In addition, overall capitalization rates can be derived from the built-up method (band-of-investment). This method relates to satisfying the market return requirements of both the debt and equity positions of a real estate investment. This information is obtained from real estate and financial publications.

Rent loss concessions are made on specific properties with vacancy problems. A rent loss concession accounts for the impact of lost rental income while the building is moving toward stabilized occupancy. The Aumentum income module has a component that assists the appraiser in estimating typical costs incurred during a lease up period. Market rent, actual occupancy rate, stabilized occupancy rate, absorption period, build out allowances (for first generation space or retrofit/second generation space as appropriate) and leasing expenses are all considered in the calculation. The total adjusted loss from these real property operations is discounted using an acceptable risk rate. The discounted value (inclusive of rent loss due to extraordinary vacancy, build out allowances and leasing commissions) becomes the rent loss or lease up concession and is deducted from the value indication of the property at stabilized occupancy. A variation of this technique allows that for every year that the property's actual occupancy is less than stabilized occupancy a rent loss deduction may be estimated.

The TAD commercial department income approach is highly standardized using the Aumentum mass appraisal-based income modeling application. The process requires extensive analysis of market and actual income data by both the appraisal and research staff. Improved properties are grouped based on similar income and market characteristics.

Prior to the valuation process, several key technical appraisers analyze the actual income data for creating a series of income models. Each income models contain the necessary data to compute an indication of value using the income formula. This data includes gross potential rent rate per square foot, economic vacancy percent, other income per square foot, and an expense rate per square foot and as a percent. This data is then applied in the model portion of the Aumentum income application, to properties that have the same market area, age range and size range, as specified for each specific category of improved property. The cap rate is the variable for each model, as the appraiser must consider the various market and property elements in selecting the appropriate rate for each subject property.

The appraiser completes the income valuation process by selecting either the subject's actual income or the model data as the best market indicators. This data is then imported to the pro forma portion of the Aumentum income application. The appraiser reviews the data and indicated value and makes adjustments as necessary, to come up with a final indication of value. This value is carried forward to the value summary screen to be considered in the final value reconciliation process.

Sales Comparison (Market) Approach

The sales comparison approach estimates the market value of a subject property by adjusting the sales prices of comparable properties for differences between the comparables and the subject. Although all three of the approaches to value are based on market data, the Sales Comparison Approach is most frequently referred to as the Market Approach. This approach is utilized not only for estimating land value but also in comparing sales of similarly improved properties to each parcel on the appraisal roll. As previously discussed in the Data Collection / Validation section of this report, pertinent data from actual sales of properties, both vacant and improved, is collected throughout the year in order to obtain relevant information which can be used in all aspects of valuation. Sales of similarly improved properties can provide a basis for the depreciation schedules in the Cost Approach, rates and multipliers used in the Income Approach, and as a direct comparison in the Sales Comparison Approach. Improved sales are also used in internal ratio study analysis, which affords the appraiser an excellent means of judging the current accuracy and uniformity of the appraised values.

The commercial department market approach is standardized through the application of the Aumentum mass appraisal-based sales comparison model. The model specification or definition process begins with extensive analysis of market and actual sale data by both the appraisal and research staff. Improved properties are grouped into submarkets or improved market areas based on similar income and market characteristics. Property type, size, location, age and condition are the generally key attributes that identify sale comparability. These characteristics or attributes are reflected in the model definitions. The process of determining the specific attributes and the relationship among the attributes is known as model specification. The appraisers select and define specific criteria that are used to extract a grouping of sales from the commercial database. Each improved sale model has a unique set of selection criteria. Each selection or definition process will produce a set of sale results that can be used to value a similar subject property.

The sales groupings are summarized in sale model results grids. Model calibration involves adjusting

the sold properties for any attributes that may differ from the subject property. Standardized adjustments can be developed using paired sale analysis, multiple regression analysis, adaptive estimation process and the cost method. During the valuation process, the commercial appraisal staff reviews the model-driven sale results set for each commercial property and determines which sales are most comparable to the subject. The sales comparison model has the capability to apply appraiser-derived adjustments for differences between the subject and the sales and sales can be weighted for level of comparability. The appraiser reviews the indicated value results for the subject based on the value range, median and average sales prices and indicates a value for the subject in the sales comparison module. This value is carried forward to the Aumentum value summary screen to be considered in the final value reconciliation process.

Final Valuation Schedules

Based on the market data analysis and review discussed previously in the cost, income and sales approaches, the cost, sale and income models are calibrated and finalized. The cost and depreciation calibration results are calculated in Aumentum MVP database tables for utilization on all commercially coded properties in the district. Cost data can be retrieved based on building class. Depreciation information is calculated based on class, condition and effective age. The sale and income model definition criteria are also stored in Aumentum.

Statistical and Capitalization Analysis

Statistical analysis of final values is an essential component of quality control. This methodology represents a comparison of the final value against the standard and provides a concise measurement of the appraisal performance. Statistical comparisons of many different standards are used including sales of similar properties, the previous year's appraised value, audit trails, value change analysis and sales ratio analysis.

Appraisal statistics of central tendency and dispersion generated from sales ratios are available for each property type. These summary statistics including, but not limited to, the weighted mean, standard deviation and coefficient of variation, provide the appraisers an analytical tool by which to determine both the level and uniformity of appraised value of a particular property type. The level of appraised values can be determined by the weighted mean for individual properties within a specific type, and a comparison of weighted means can reflect the general level of appraised value. Review of the standard deviation and the coefficient of variation can discern appraisal uniformity within a specific property type.

The appraisers review every commercial property type annually through the sales ratio analysis process. The first phase involves ratio studies that compare the recent sales prices of properties to the appraised values of the sold properties. This set of ratio studies affords the appraiser an excellent means of judging the present level of appraised value and uniformity of the appraised values. The appraiser, based on the sales ratio statistics and designated parameters for valuation update, makes a preliminary decision as to whether the value level of a particular property type needs to be updated in an upcoming reappraisal, or whether the level of market value is at an acceptable level.

Potential gross rent estimates, occupancy levels, secondary income, allowable expenses (inclusive of non-recoverables and replacement reserves), net operating income and capitalization rate and multipliers are continuously reviewed utilizing frequency distribution methods or other statistical procedures or measures. Income model conclusions are compared to actual information obtained on individual commercial properties during the hearings process as well as information from published sources and area vendors.

INDIVIDUAL VALUE REVIEW PROCEDURES

Field Review

The date of last inspection, extent of that inspection, and commercial appraiser code are listed in the Aumentum system. If a property owner disputes the District's records concerning this data in a protest hearing, the record may be corrected based on the credibility of the evidence provided. Typically, a new field check is then requested to verify this evidence for the current year's valuation or for the next year's valuation. In addition, if a building permit is filed for a particular property indicating a change in characteristics, that property is added to a permit work file. In 2018, the commercial appraisal staff worked 3,858 building permits. The commercial appraisal division reappraisal work plan allows for a physical inspection of every property at least once every four years.

Commercial appraisers are somewhat limited in the time available to field review all commercial properties of a specific use type. However, a major effort is made by appraisers to field review as many properties as possible or economic areas experiencing large numbers of remodels, renovations, or retrofits, changes in occupancy levels or rental rates, new leasing activity, new construction, or wide variations in sale prices. Additionally, the appraisers frequently field review subjective data items such as building class, quality of construction, condition, and physical, functional and economic obsolescence factors contributing significantly to the market value of the property. In some cases field reviews are warranted when sharp changes in occupancy or rental rate levels occur between building classes or in rapidly changing economic areas. With preliminary estimates of value in these targeted areas, the appraisers test computer assisted values against their own appraisal judgment. While in the field, the appraisers physically inspect and photograph sold and unsold properties for comparability and consistency of values.

Office Review

A final value review is completed by the appraisal staff and involves a final reconciliation of the three approaches to value. Each of the three approaches to value is summarized. The appraiser determines if one of the three methods is most appropriate or may weight the results of all three approaches to formulate a final value for each commercial property. If the final value is based on the cost approach, a cost summary report will display the cost detail and percent good for each improved component or taxable object. The land is valued separately, generally using the sales comparison approach. The total property value will result from the total of the depreciated replacement cost for those improvements plus the land value. If the final appraised value is selected based on the reconciliation of more than one approach, then the value is indicated on the Value Correlation screen with each percentage weight

applied and calculated to produce a “reconciled value.”

Appraisal managers also produce a multitude of edit and audit reports to review the uniformity and accuracy reports of the commercial appraisal values. These reports are generally reviewed by category and show proposed percentage value changes, income and sales model application, new construction status, and overall value ranges. Each parcel is subjected to the value parameters appropriate for its use type. The managers also review methodology for appropriateness to ascertain that it was completed in accordance with USPAP, statutory and district policies. This review is performed after preliminary ratio statistics have been applied. If the ratio statistics are generally acceptable overall, the review process is focused primarily on locating skewed results on an individual basis. Previous values resulting from protest hearings are individually reviewed to determine if the value remains appropriate for the current year based on market conditions.

Once the appraisers and managers are satisfied with the level and uniformity of value for each commercial property, the estimates of value are ready for value notification. Although the value estimates are determined in a computerized mass appraisal environment, value edits and rework lists enable an individual parcel review of value anomalies before the estimate of value is released for notices.

Performance Tests

The primary tool used to measure mass appraisal performance is the ratio study. A ratio study compares appraised values to market values. In a ratio study, market values (value in exchange) are typically represented by sales prices (i.e. a sales ratio study). Independent, expert appraisals may also be used to represent market values in a ratio study (i.e. an appraisal ratio study). If there are not enough sales to provide necessary representativeness, independent appraisals can be used as indicators for market value. This can be particularly useful for commercial, warehouse or industrial real property for which sales are limited. In addition, appraisal ratio studies can be used for properties statutorily not appraised at market value, but reflect the use-value requirement. An example of this are multi-family housing projects subject to subsidized rent provisions or other governmental guarantees as provided by legislative statutes (affordable housing) or agricultural lands to be appraised on the basis of productivity or use value.

Tarrant Appraisal District has adopted the policies of the IAAO STANDARD ON RATIO STUDIES, circa January 2010 regarding its ratio study standards and practices. Ratio studies generally have six basic steps: (1) determination of the purpose and objectives, (2) data collection and preparation, (3) comparing appraisal and market data, (4) stratification, (5) statistical analysis, and (6) evaluation and application of the results.

Sales Ratio Studies

Sales ratio studies are an integral part of establishing equitable and accurate market value estimates,

and ultimately assessments for this taxing jurisdiction. The primary uses of sale ratio studies include the determination of a need for general reappraisal; prioritizing selected groups of properties types for reappraisal; identification of potential problems with appraisal procedures; assist in market analyses; and recalibration of appraisal models used to derive appraised values during valuation or reappraisal cycles. However, these studies cannot be used to judge the accuracy of an individual property appraised value. The Tarrant Appraisal Review Board may make individual value adjustments based on unequal appraisal (ratio) protest evidence submitted on a case-by-case basis during the hearing process.

Overall sales ratios are generated by use type semi-annually (or more often in specific areas) to allow appraisers to review general market trends in their area of responsibility. In many cases, field checks may be conducted to insure the ratios produced are accurate and the appraised values utilized are based on accurate property data characteristics. These ratio studies aid the appraisers by providing an indication of market activity by economic area or changing market conditions (appreciation or depreciation).

Comparative Appraisal Analysis

The commercial appraiser performs an average unit value comparison in addition to a traditional ratio study. These studies are performed on commercially classed properties by property use type (such as apartment, office, retail and warehouse usage or special use). The goal of this analysis is to compare the appraisal performance of sold and unsold properties. These studies are conducted on substrata such as building class and on properties located within various economic areas. In this way, overall appraisal performance is evaluated geographically, by specific property type to discern whether sold parcels have been selectively appraised. When sold parcels and unsold parcels are appraised equally, the average unit values are similar. These horizontal equity studies are performed prior to annual noticing.

Business Personal Property Valuation Process

INTRODUCTION

Appraisal Responsibility

The Business Personal Property Department (BPP) of the Tarrant Appraisal District (TAD) is responsible for developing fair and uniform market values for business personal property located within the district. There are four different account types appraised: (1) standard business personal property, (2) leased asset/special property at multiple locations, (3) commercial aircraft, and (4) special inventory. In 2018, there were approximately 49,000 total commercial and industrial personal property accounts. The department also manages mineral interest accounts although the valuation of the accounts is conducted by a third-party appraisal firm. In 2018, there were approximately 1,100,000 accounts.

Appraisal Resources

- **Personnel** – The BPP staff consists of a department director, an appraisal manager, a research manager, fifteen appraisers, a clerical supervisor and five entry clerks
- **Data** – A common set of data characteristics for each account in the district is collected primarily in the field by the appraiser workgroups and is entered into the Aumentum system by the clerical staff. These assigned property characteristics direct the CAMA software system to a preliminary account value.

VALUATION APPROACH (model specification)

Business Classification Code Analysis

Numeric business classification codes are used as the basis for classification and valuation of business personal property accounts. Business classification code identification and delineation is the cornerstone of the business personal property valuation system in the district. All of the analysis work done in association with the valuation process is specific to the business classification code. There are in excess of 600 business classification codes. Business classification codes are delineated based on observable aspects of homogeneity. Business classification code delineation is periodically reviewed to determine if further delineation is necessary.

Highest and Best Use Analysis

The highest and best use of property is the reasonable and probable use that supports the highest present value as of the date of the appraisal. The highest and best use must be physically possible, legally permissible, financially feasible, and maximally productive. The highest and best use of business personal property is normally its current use.

DATA COLLECTION/VALIDATION

Data Collection Procedures

Business personal property data collection procedures are published and distributed to all appraisers involved in the appraisal and valuation process. The appraisal procedures are reviewed and revised to meet the changing requirements of field data collection. The most recent revision of the data collection procedures was for tax year 2015.

Sources of Data

Standard Business Personal Property Account

TAD's property characteristic data was originally received from Tarrant County and the various city/school district records between 1981 and 1982, and where absent, collected through a massive field data collection effort coordinated by the district over a period of time. When revaluation activities permit, district appraisers collect new data via an annual field drive-out. This project results in the discovery of new businesses not revealed through other sources. Various discovery publications such as the Fort Worth Business Press, Texas DOT commercially registered vehicle listing (provided by Infonation Inc.), sales tax permits listings, and local occupancy permits are also used for discovery purposes. Tax assessors, city and local newspapers, business owners, and district residents provide discovery information and other useful facts related to valuation.

Leased Asset/Special Property at Multiple Locations Account

The primary source of discovery for these accounts is owner renditions submitted in either hard copy or electronic format. Field inspections are sometimes used to supplement this information.

Commercial Aircraft

"Air Pac", a private company in Edmond, Oklahoma, consolidates information from the Federal Aviation Administration (FAA) along with local airport/airfield management and provides TAD with a listing of

commercial aircraft with situs in this district. Valuation is accomplished by referencing the Aircraft Blue Book Price Guide (Winter Edition) and the Airliner Price Guide to establish 100% market value. Owner renditions are then referred to for any allocation required.

Special Inventory

In coordination with the Tarrant County Tax Assessor/Collector, a copy of the monthly and annual declaration forms for boat, heavy equipment, manufactured housing, and motor vehicle dealers (as defined by Section 23 of the Texas Property Tax Code) are maintained at TAD and used for discovery and valuation of special inventory accounts. Alternate discovery methods may sometimes be used as described in the Standard Business Personal Property Account section.

VALUATION AND STATISTICAL ANALYSIS (model calibration)

Cost Schedules

Cost schedules are developed by business classification code by TAD BPP appraisers under the supervision of valuation analysts. The cost schedules are developed by analyzing cost data from property owner renditions, Settlement and Waiver of Protest documentation, Appraisal Review Board (ARB) hearing evidence, Texas Comptroller schedules, and published cost guides (such as Marshall & Swift Commercial Contents and Inventory software). The cost schedules are reviewed annually (at a minimum) to reflect changing market conditions. TAD schedules are exclusively in a price per square foot format. Documentation for these schedules is archived in the department.

Statistical Analysis

Summary statistics such as the median, weighted mean and standard deviation provide appraisers an analytical tool by which to determine both the level and uniformity of appraised value by business classification code.

Depreciation Schedule and Trending Factors:

TAD's primary approach to the valuation of business personal property is the cost approach. The replacement cost new (RCN) is either developed from property owner reported historical cost or from TAD developed valuation models. The trending factors used by TAD in the development of the depreciation schedule are based on published valuation guides. The percent good depreciation factors used by TAD are also based on published valuation guides. The index factors and percent good depreciation factors were used to develop present value factors (PVF), by year of acquisition, as follows:

$$\text{PVF} = \text{INDEX FACTOR} \times \text{PERCENT GOOD FACTOR}$$

The PVF is used as an “express” calculation in the cost approach. The PVF is applied to reported historical cost as follows:

$$\text{MARKET VALUE ESTIMATE} = \text{PVF} \times \text{HISTORICAL COST}$$

A depreciation schedule was then adopted that reflects all of the preceding calculations. This mass appraisal PVF schedule is used to ensure that estimated values are uniform and consistent within the market.

Valuation Models

The two main objectives of the valuation model process are to: (1) analyze and adjust existing business classification models and (2) develop new models for business classifications not previously integrated into Aumentum. The delineated sample is reviewed for accuracy of business classification code, square footage, field data, and original cost information. Models are created and refined using actual original cost data to derive a typical replacement cost new (RCN) per square foot for a specific category of assets. The RCN per square foot is depreciated by the estimated age using the depreciation table adopted for the tax year.

The data sampling process is conducted in the following order: 1) Prioritizing business classification codes for model analysis. 2) Compiling the data and developing the reports. 3) Field checking the selected samples. The models are built and adjusted using internally developed software. The models are then tested against the previous year's data. The typical RCN per square foot (or applicable unit) is determined by a statistical analysis of the available data.

Standard Business Personal Property Account

Valuation models are used in the business personal property valuation program to estimate the value of new and/or existing accounts for which no property owner's rendition has been filed. Model values are also used to establish tolerance parameters for testing the valuation of property for which prior data years' data exist or for which current year rendered information is available. The calculated current year value or the prior year's value is compared to the indicated model value by the valuation program. If the value being tested is within an established acceptable percentage tolerance range of the model value, the account passes that range check and moves to the next valuation step. If the account fails the tolerance range check, it is flagged for individual review. Allowable tolerance ranges may be adjusted from year to year depending on the analysis of the results of the prior year.

Leased Asset/Special Property at Multiple Locations Account

Leased and multi-location assets are valued using the PVF schedules mentioned above. If the asset to be valued in this category is a vehicle, then NADA published book values are used. Assets, including vehicles, that are not valued directly from a third party source, are valued by an appraiser using PVF schedules or published guides.

Commercial Aircraft

Valuation is accomplished by referencing the Aircraft Blue Book Price Guide (Winter Edition) and the Airliner Price Guide, which is updated annually. Aircraft that are not valued by this method are valued by an appraiser using PVF schedules.

Special Inventory

Valuation is based upon the annual declaration filed by the property owner indicating the previous year's Texas sales (used as the numerator) and divided by a factor of 12 (the denominator). This establishes a monthly basis consistent with the owner's tax payment requirements. In the absence of an annual declaration, like businesses that have filed declarations are identified and adjusted to the subject property to establish an estimated market value.

INDIVIDUAL VALUE REVIEW PROCEDURES

Office Review

Standard Business Personal Property Account

A BPP valuation program exists in Aumentum's Personal Property Appraisal (PPA) module that identifies accounts in need of review based on a variety of conditions. Property owner renditions, accounts with field or other data changes, accounts with prior hearings, new accounts, and NAICS cost table changes are all considered. The accounts are processed by the valuation program and pass or fail preset tolerance parameters by comparing appraised values to prior year and model values. An appraiser reviews accounts that fail the tolerance parameters.

Leased Asset/Special Property at Multiple Locations Account

Leased Asset/Special Property accounts that have a high volume of vehicles or other assets are loaded programmatically if reported by the property owner electronically. Electronic renditions either emailed or on diskette, often require reformatting before they can be loaded to the account. Accounts that render by hard copy are data entered by the BPP clerical staff. After matching and data entry, reports are generated and reviewed by an appraiser. Once proofed, necessary corrections are made, supervisor approval is granted, and the account is sent a value notice.

Commercial Aircraft

The valuation and review process of commercial aircraft accounts are conjoined. These accounts are simultaneously valued/reviewed with rendered data and a third party market value guide.

Special Inventory

TAD's perpetual account tracking system ensures dealers without a current declaration on file are contacted to advise them of their legal filing requirements and to provide TAD with the most current valuation/review data available.

PERFORMANCE TESTS

Ratio Studies

Each year the Property Tax Division of the state comptroller's office conducts a property value study (PVS). The PVS is a ratio study used to gauge appraisal district performance. Results from the PVS play a part in school funding. Rather than a sales ratio study, the personal property PVS is a ratio study using state cost and depreciation schedules to develop comparative personal property values. These values are then compared to TAD's personal property values and ratios are formed.

Internal Testing

TAD can test new or revised cost and depreciation schedules by running the valuation program in a test environment prior to the valuation cycle. This can give appraisers a chance to make additional refinements to the schedules if necessary.

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LIMITING CONDITIONS

The appraised value estimates provided by the district are subject to the following conditions:

1. The appraisals were prepared exclusively for ad valorem tax purposes in accordance with Texas state tax laws. The analysis, opinions and conclusions were developed and this report has been prepared, in conformity with the Uniform Standards of Professional Appraisal Practice, Standards Five and Six, as adopted by the Appraisal Standards Board of the Appraisal Foundation. The District also adheres to IAAO standards as they apply to mass appraisal and conform to Texas laws.
2. The property characteristic data upon which the appraisals are based is assumed accurate and correct. Exterior inspections of the properties appraised were performed as staff resources and time allowed. Interior inspections of properties are limited to TAD hours of business and subject to the availability and cooperation of property owners.
3. Validation of sales transactions was attempted through questionnaires to buyer and seller, telephone survey and field review. In the absence of such confirmation, sales data obtained from vendors was considered reliable.
4. A list of staff providing significant mass appraisal assistance to the person signing this certification is attached to this report. The compensation of appraisal district employees is not contingent upon the development or reporting of a predetermined or prescribed value.
5. The district's 2018 MAP results and the results of the 2017 ratio study are available upon request from the Property Tax Assistance Division of the Texas Comptroller.

Certification Statement:

"I, Jeffery D. Law, Chief Appraiser for the Tarrant Appraisal District, solemnly swear that I have made or caused to be made a diligent inquiry to ascertain all property in the district subject to appraisal by me, and that I have included in the records all property that I am aware of at an appraised value which, to the best of my knowledge and belief, was determined as required by law."



Jeffery D. Law

Date: December 28, 2018

Executive Director/Chief Appraiser

<u>DEPARTMENT</u>	<u>EMPLOYEE</u>	<u>POSITION</u>
	JEFFERY D. LAW	EXECUTIVE DIRECTOR/CHIEF APPRAISER
<u>ADMINISTRATION</u>	JEFF CRAIG	DIRECTOR OF ADMINISTRATION
	VICKI WILLKIE	MANAGER OF ARB OPERATIONS
<u>RESIDENTIAL</u>	RANDY ARMSTRONG	DIRECTOR OF RESIDENTIAL APPRAISAL
	TROY HANSON ERIC WATKINS BRANDON CANARD MELE LANGLOIS VICTOR GUADALUPE	DIVISION MANAGER DIVISION MANAGER DIVISION MANAGER DATA QUALITY SUPERVISOR DATA COLLECTION SUPERVISOR
<u>COMMERCIAL</u>	DAVID LAW	DIRECTOR OF COMMERCIAL APPRAISAL
	WILLIE BRAND DEBBIE CABELLO WILLIAM F. DURHAM ROY SMITH TERRY SPRADLIN	COMMERCIAL/COMPLEX PROPERTIES MANAGER RESEARCH AND REPORTING MANAGER LITIGATION MANAGER REGIONAL APPRAISAL MANAGER REGIONAL APPRAISAL MANAGER
<u>BPP, UTILITY & MINERALS</u>	BRAD PATRICK	DIRECTOR OF BPP APPRAISAL
	MATT TRACY GARY ANDERSON	APPRAISAL MANAGER RESEARCH MANAGER
<u>SUPPORT SERVICES</u>	DONNA PERLICK	DIRECTOR OF SUPPORT SERVICES
	PRECIOUS BOWERS DEBBIE BRANCH DAMIANA REYES	SUPPORT SERVICES MANAGER EXEMPTIONS SUPERVISOR CUSTOMER SERVICE SUPERVISOR
<u>INFORMATION SERVICES</u>	DJ WHITEHEAD	DIRECTOR OF INFORMATION SERVICES
	STEVEN OAKES DON MORRIS ROBERT PAYNE MICHAEL RUSSELL GREG DEAN KARINA DAWSON- PHILPOT	BUSINESS ANALYST & PROGRAMMING MGR. WEB SOLUTIONS MANAGER TECHNICAL SUPPORT MANAGER SPECIAL ASSISTANT TO THE IS DIRECTOR IT INFRASTRUCTURE MANAGER GIS MANAGER