



2019 - 2020 Reappraisal Plan

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Tarrant Appraisal District 2019-2020 Reappraisal Plan

INTRODUCTION

General Overview of Tax Code Requirement

Passage of Senate Bill 1652 in 2005 amended the Property Tax Code to require each Appraisal District to prepare a biennial reappraisal plan. The following details the Tax Code requirements:

The Written Plan

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

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

Plan for Periodic Reappraisal

Subsections (a) and (b), Section 25.18, Property Tax Code, read as follows:

- (a) Each appraisal office shall implement the plan for periodic reappraisal of property approved by the board of directors under Section 6.05(i).
- (b) The plan shall provide for the following reappraisal activities for all real and personal property in the district at least once every three years:
 - (1) Identifying properties to be appraised through physical inspection or by other reliable means of identification, including deeds or other legal documentation, aerial photographs, land-based photographs, surveys, maps, and property sketches;

- (2) Identifying and updating relevant characteristics of each property in the appraisal records;
- (3) Defining market areas in the district;
- (4) Identifying property characteristics that affect property value in each market area, including:
 - (a) The location and market area of the property;
 - (b) Physical attributes of the property, such as size, age, and condition;
 - (c) Legal and economic attributes; and
 - (d) Easements, covenants, leases, reservations, contracts, declarations, special assessments; ordinances, or legal restrictions;
- (5) Developing an appraisal model that reflects the relationship among the property characteristics affecting value in each market area and determines the contribution of individual property characteristics;
- (6) Applying the conclusions reflected in the model to the characteristics of the properties being appraised; and
- (7) Reviewing the appraisal results to determine value.

Scope of Responsibilities

Tarrant Appraisal District (TAD) has prepared and published this reappraisal plan to provide the Board of Directors, taxing units, citizens and taxpayers with a better understanding of the District's responsibilities and anticipated reappraisal activities. This report contains a general introduction to TAD's role in the property tax system and several sections describing the proposed reappraisal effort by the appraisal departments within TAD.

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. 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 assessor-collector also serves on the board but is a non-voting member. The Chief Appraiser, appointed by the Board of Directors, is the chief administrator and chief executive officer of the appraisal district. The chief appraiser is allowed by law to delegate authority and appraisal responsibilities to his/her employees.

TAD is responsible for local property tax appraisal and exemption administration for over seventy jurisdictions or taxing units within the 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 schools, road and street maintenance, courts, water and sewer systems, and other public services. Property taxable values are determined by the appraisal district and used by the taxing units to calculate and allocate the annual tax burden. 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.

The statutes of the Texas Property Tax Code establishes the legal foundation of property taxes in Texas and provide appraisal districts with a comprehensive set of instructions and requirements for the appraisal of real and personal property with its jurisdiction. Chapter 1, Section 1 includes general provisions and key definitions relative to the appraisal process. Section 1.04(7) states ***“Market value” means the price at which a property would transfer for cash or its equivalent under prevailing market conditions if:***

(A) exposed for sale in the open market with a reasonable time for the seller to find a purchaser;

(B) 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;

(C) 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.

Per Section 21.01, real property values are determined as of January 1st, unless special appraisal provisions are otherwise provided. Section 21.02 states that business personal property values are also determined as of January 1st, unless a special provision, provided within the Tax Code, is provided. Chapter 23, Subchapter A. is entitled *“Appraisals Generally”* and further defines the scope of work required for local property tax appraisals. Section 23.01(a) states that ***“Except as otherwise provided by Chapter 23, all taxable property shall be appraised based on each property's worth or market value.”*** Section (b) further mandates, ***“The market value is determined by the application of generally accepted appraisal methods and techniques. If the appraisal district determines the appraised value of a property using mass appraisal standards, the mass appraisal standards must comply with the Uniform Standards of Professional Appraisal Practice. The same or similar appraisal methods and techniques shall be used in appraising the same or similar kinds of property. However, each property shall be appraised based upon the individual characteristics that affect the property's market value, and all available evidence that is specific to the value of the property shall be taken into account in determining the property's market value”.*** The chief appraiser and his/her staff are further instructed to consider the cost, income and sales comparison methods of appraisal and to use the most appropriate valuation method to determine the market value for each property.

Section 23.01, subsection (e) was added in 2009 to address the valuation of properties lowered in a previous year under the Remedies (Subtitle F) section of the tax code. Section 23.01(e) prohibits a chief appraiser from raising the value of these properties, in the following year unless the increase is supported by substantial evidence. The subsection also places conditions on the valuation of properties that were lowered in the previous year, related to remedies for unequal appraisal. Additional instructions were also provided relative to the appraisal of a residential homestead property. The new provisions in subsection(c) became effective on January 1, 2010.

The remainder of Chapter 23 of the tax code provides for a host of special appraisal provisions to be used in the valuation of specific types of properties. For example, there are instructions for the appraisal of residential real property inventory (§ 23.12), dealer's inventory (§ 23.121, 23.124, 23.1241 and 23.127), taxable leaseholds (§ 23.13), oil or gas interests (§ 23.175), homeowner' organization property (§ 23.18), low income, tax credit housing (§ 23.215), residential homestead property (§ 23.23), agricultural use land (§ 23.41), open-space land (§ 23.52), and public access airport property (§ 23.91). The scope of the appraisal assignment will vary for those properties that are subject to special appraisal provisions as provided by Chapter 23 or Chapter 25 of the property tax code.

Section 25.18 requires each appraisal office to implement a plan to update appraised values for real property at least once every three years. TAD's current policy is to conduct a general reappraisal of real and business personal property value annually, meaning that a property's appraised value is established and reviewed for equality and uniformity each year. The district conducts an onsite field review of real and personal property in a portion of the county annually as part of a reappraisal cycle.

The appraised value of real and business personal property is calculated using specific information and data about each property. Utilizing various computer-assisted mass appraisal (CAMA) programs, and generally recognized appraisal methods and techniques, licensed and trained property tax 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. USPAP identifies a minimum set of standards that apply in all appraisal assignments.

In cases where the appraisal district contracts for professional valuation services, the contract requires adherence to similar professional standards. The outside valuation firm is also required to develop a mass appraisal report and reappraisal plan.

Overview of District Operations

2019 & 2020 Proposed Calendar of Key Events (See Appendix A)

2019 & 2020 Budgets Are Adopted by Resolution

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.

Three separate appraisal departments are responsible for the valuation of all real and business personal property. The Commercial Department has four work divisions: commercial real property appraisal, complex property appraisal, commercial research/reporting and litigation/arbitration. Business Personal Property Appraisal includes personal property, utilities and mineral appraisal and research. The Residential Department includes residential appraisal, research and an agricultural land valuation section. The 2019 and 2020 adopted budgets provide information for TAD employee positions and classifications.

Staff Education and Training

All appraisal district employees that perform appraisal work are subject to the provisions contained in the Texas Constitution and Texas Property Tax Code. The Texas Department of Licensing and Regulation (TDLR) is charged with licensing and regulating those individuals who appraise property or assess and collect property taxes by monitoring compliance with the Property Taxation Professional Certification Act, Occupations Code, Chapter 1151 and other rules. The Texas Tax Professional Advisory Committee, with seven members appointed by the TDLR, advise on tax professional regulatory issues.

TDLR is responsible for ensuring appraisers are professional, knowledgeable, competent and ethical. This is accomplished through a statewide program of registration, education, experience, testing and certification for all property tax professionals. The Comptroller's Property Tax Assistance Division has been given the responsibility of reviewing and approving the appraisal courses and other educational materials

Appraisers registered with the TDLR have up to five years to take nine appraisal courses and pass two additional exams in order to achieve certification as a Registered Professional Appraiser (RPA). During each subsequent two year period after certification, appraisers must complete an additional 30 hours of continuing education. Failure to meet these minimum standards will ultimately result in the removal of the employee from an appraiser position. TDLR also ensures that all registrants comply with the requirements of the Property Taxation Professional Certification Act and adhere to the set of ethical standards set forth in the Texas Administrative Code (TAC) Chapter 94.

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.

Data

U.S. Census Bureau statistics for 2017 indicate that Tarrant County had an estimated population of 2,054,475. This represents an approximate 14% increase in population since 2010 or approximately 2% growth per year. The county has a total area of 902 square miles, comprised of 864 square miles of land and 39 square miles (4.3%) of water. For 2018, the district was responsible for establishing and maintaining approximately 1,754,000 real estate and 59,000 business personal property accounts located within the boundaries of Tarrant County. Mineral valuations account for 1,090,000 of the real estate accounts. Mineral accounts are created when a property owner has a producing mineral interest in an oil or gas well.

The following chart contains the projected numbers of TAD's parcels for the 2019-2020 reappraisal cycles:

	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>
Real Estate Accts	640,152	648,294	654,536	661,819	665,700	671,000
BPP Accounts	48,056	47,585	57,880	58,805	59,700	60,700
Mineral Accounts	975,133	983,794	1,042,815	1,091,953	1,131,000	1,172,000
Total Accounts	1,663,341	1,679,673	1,755,231	1,812,577	1,856,400	1,903,700
Total Added Accounts	203,958	16,332	75,558	57,346	43823	47,300
Total % Increase	13.98%	.98%	4.50%	3.27%	2.42%	2.55%
	Sept 1 Roll	July 25 Roll	Sept 1 Roll	July 25 Roll	**Projected	**Projected

Each TAD parcel contains data related to property characteristics, ownership and exemption information. Accurate ownership and legal description data is maintained by processing recorded deeds and plats that are provided by the Tarrant County Clerk's office. Exemptions are administered based on statutes and monetary guidelines authorized by state and local

governments. Exemption data is processed and maintained in conjunction with various application requirements as stipulated in the State Property Tax Code.

Existing property characteristics data is updated and maintained through on-site inspections and other generally accepted methods. The property data related to new construction and other building permit activity is also collected through an annual field review effort. Each city within TAD's jurisdiction provides permit information either electronically or in paper form. Comparable sales data is also routinely validated as part of the building permit field review and reappraisal activities.

General demographic, economic and financial trends, construction cost, 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, as well as information collected from property owners and agents during the informal appeal and Appraisal Review Board process. 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 contains cadastral maps and includes various layers of data, including parcel lines, FEMA flood data, zoning, jurisdictional boundaries and aerial photography. TAD is dependent upon local cities to provide updated zoning information for the cadastral maps.

The district's website makes a range of information available for public access. The site also provides links to connect users to related websites for taxing units, other appraisal districts and state government resources. Property owners can access additional online information from TAD's website (www.tad.org) that includes property characteristics data, preliminary and certified values, protests and appeal procedures, property maps, and a tax calendar. Residential and commercial property owners can access the district's Internet site to obtain a copy of their pending ARB case evidence. Downloadable files of related tax information and district forms; including various application forms, ARB protest notices and business personal property renditions are also available. ARB protests can be filed on a downloaded form or on-line. TAD has also implemented an online rendition process for business owners that choose to file their renditions electronically.

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.

Shared Appraisal District Boundaries (Overlapping Jurisdictions)

TAD is responsible for over seventy taxing jurisdictions, covering 902 square miles. Several of these jurisdictions have boundaries that fall outside of Tarrant County. Revisions to Section 6.025 of the Tax Code (2008) now identify appraisal district boundaries are the same as the county's boundaries. Coordination of appraisal values, with other appraisal districts, will continue to occur for the approximately 1,000 taxable parcels that are split by county jurisdictional lines. Over 70% of the overlapping parcels are residential.

Independent Performance Test

Effective January 1, 2010, Chapter 5.102 of the Texas Property Tax Code was amended by House Bill 8 to require "at least once every two years, the Comptroller shall review the governance of each appraisal district, taxpayer assistance provided, and the operating and appraisal standards, procedures and methodology used by each appraisal district to determine compliance with generally accepted standards, procedures, and methodology." The Comptroller's Property Tax Assistance Division (PTAD) is currently performing the Methods and Assistance Program (MAP) review in approximately half of all Texas CADs, including Tarrant County. TAD will be evaluated and the PTAD will deliver a preliminary report in September 2018, with draft recommendations for corrections and compliance measures. The PTAD will continue to work with TAD if necessary to correct any deficiencies throughout the fall of 2018. In December, a final report will be submitted to TDLR and the TAD board of directors.

Section 403.302 of the Texas Government Code was also amended to change the frequency of the property value study (PVS) for school districts from an annual to a biennial process. As a part of the annual study, the Code 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 (MSP 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 5% 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 Tarrant County for which appraisal rolls are annually developed. The preliminary results of the PTAD value study are released in January of 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 TAD in determining areas of market activity or changing market conditions. Results from the upcoming 2019 Property Value Studies will be reviewed and analyzed by appraisal management. Geographic areas or property categories with unsatisfactory ratio results will be added to the work plan for the 2019-2020 reappraisal cycles.

Overview of Reappraisal Activities

Overview of Appraisal Responsibilities

TAD appraisal responsibilities are divided between three appraisal departments, Residential, Commercial, and Business Personal Property. The Residential Appraisal Department is organized into four geographic regions or quadrants. The department also contains an Agricultural Land Appraisal Section and a Research Section. The Commercial Appraisal Department consists of four divisions; Commercial Appraisal, Complex property Appraisal, Commercial Research and Reporting, and Litigation/Arbitration. The Business Personal Property (BPP) department includes personal property, utility and mineral appraisal.

In each 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 an inspection of all real and personal property accounts. It is the goal of TAD's appraisal departments to periodically complete a thorough on-site field review of all residential and commercial properties. Business personal property data is field-verified every year. Meeting this goal is dependent on budgetary constraints and staffing levels.

Overall Appraisal Resources

- **Personnel** - TAD appraisal activities are accomplished with a staff of appraisers and clerical personnel. Staffing resource numbers are reflected in the budget, adopted by reference. These employees are assigned to a specific appraisal department.
- **Data** - The residential, commercial and business personal property staff utilizes existing property characteristic information, collected for reliable sources, and stored in the district's current CAMA (Computer Assisted Mass Appraisal) system.

Appraisal Frequency and Method Summary

Tarrant Appraisal District has adopted an annual reappraisal cycle

- **Residential Appraisal** - Residential new construction is physically examined as part of an annual building permit data collection process. Appraisers determine size, style, quality, condition, year built, effective year of construction and other property characteristics and features that are used in the cost and sales comparison valuation methods. Vacant rural land is valued primarily using comparable sales. Lot values in subdivisions are determined primarily by market sales data, or if unavailable, by the allocated by ratio/abstraction methods. Improved residential properties are delineated by neighborhoods as defined later in this document. On an annual basis, residential

management and staff perform statistical analysis to evaluate whether values are equitable and consistent with the market. Based on analysis of the comparable sales activity, market adjustment factors are developed and applied uniformly to all appraised values within a neighborhood or specified geographic areas to adjust overall appraisal levels.

- **Commercial Appraisal** - Commercial and industrial real estate is verified using field observation and aerial photography of each property at least once every four years to confirm class, condition and other property data. Properties are also reviewed as part of an annual building permit inspection process. The appraisers determine highest and best use, when applicable, and define the appraisal site characteristics for a grouping of associated accounts. Appraisal Sites are delineated by neighborhood market areas. On an annual basis, commercial market values are established using generally accepted appraisal methods and techniques. Land values are generally determined using comparable sales data. For improved properties, appraisers consider the cost, sales comparison and income approaches to value then reconcile the final value, based on the quality and availability of the most accurate and credible data for each valuation approach. A commercial cost approach model computes site values at the aggregated account level. A total appraisal site value is developed using the commercial sales comparison and income approach models. This total overall property value is then allocated among the accounts within an appraisal site based on each specific account's classification and property characteristics.
- **Business Personal Property** - The Business Personal Property staff reappraises businesses each year through various discovery methods. Business personal property appraisers utilize survey letters, phone calls, data research and on-site inspections of businesses to verify ownership, North American Industry Classification Systems (NAICS) classification, quality and density of inventory, furniture and fixtures, square footage occupied and other key information. NAICS code identification and delineation is the cornerstone of the business personal property valuation system. The cost approach is the primary appraisal methodology used to value personal property. Cost tables are developed for each NAICS classification using actual historical cost data and market data from generally accepted cost valuation sources. The NAICS models are reviewed and tested annually. Depreciation schedules are reviewed and adjusted as necessary. Due to scheduling restrictions for both taxpayers and BPP staff, each year's fieldwork agenda is adjusted based on areas visited in the prior year. This is done so that each area of the county is visited within a three year cycle. Most business owners are required to file rendition reports annually and list key information about their tangible personal property assets. Appraisers consider information from field observations, NAICS models and owner's rendition values when determining the market value of the business personal property.

Data Collection Process

Residential appraisers utilize a standardized field collection document to verify existing property characteristics or record new property data. The worksheets are batch-produced based on the geographic area that is designated for reappraisal. Existing appraisal data is pre-printed on a property record card that is used by the appraiser to record new or modified data during an on-site inspection. Field collected data is entered onsite or returned and entered into the CAMA system. A limited amount of data entry may be performed in the field by residential appraisers using wireless laptop computers linked directly to the CAMA system.

Commercial appraisers collect on-site field data using laptop computers or field devices. Commercial appraisers are assigned a daily “work plan” during field reappraisal or building permit work cycle. The work plan consists of a group of accounts to be worked in a specified area. GIS maps, aerial photography and all the property characteristics related to the accounts in the work plan are accessible from the appraisal software’s CAMA system through the field device. The field device and digital camera are utilized to collect and record the field data during the on-site inspection.

The BPP appraisal staff collects data on pre-printed property record cards that contain existing information about the business for the appraiser to verify. Any changes to the existing data are entered from the property record cards into the CAMA system. New businesses that are discovered are reported on a new account worksheet with all necessary data collected either in person from the business owner/employee or through research with outside sources. The property record cards are printed and distributed to field appraisers that are assigned different geographic areas for data collection and discovery purposes. The appraisers also utilize laptop computers or other field devices with wireless connectivity to access appraisal data while working away from the office.

Other field inspection resources for all departments may include a MAPSCO street directory, sales and income data, fire damage reports, private water and electrical service applications, building permits, certificates of occupancy, building plans, site plans, recorded deeds and plats, photos, published articles and actual cost information. Appraisal department managers and senior staff conduct on-going quality control of the entire data entry process using numerous edit and audit reports. Supervisors and managers verify the accuracy of collected data with periodic on-site field reviews. The data validation process may pinpoint areas where additional appraiser training or resource reallocation is needed.

Residential Property 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 558,470 residential improved parcels and 44,148 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 2018 and 2020 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.

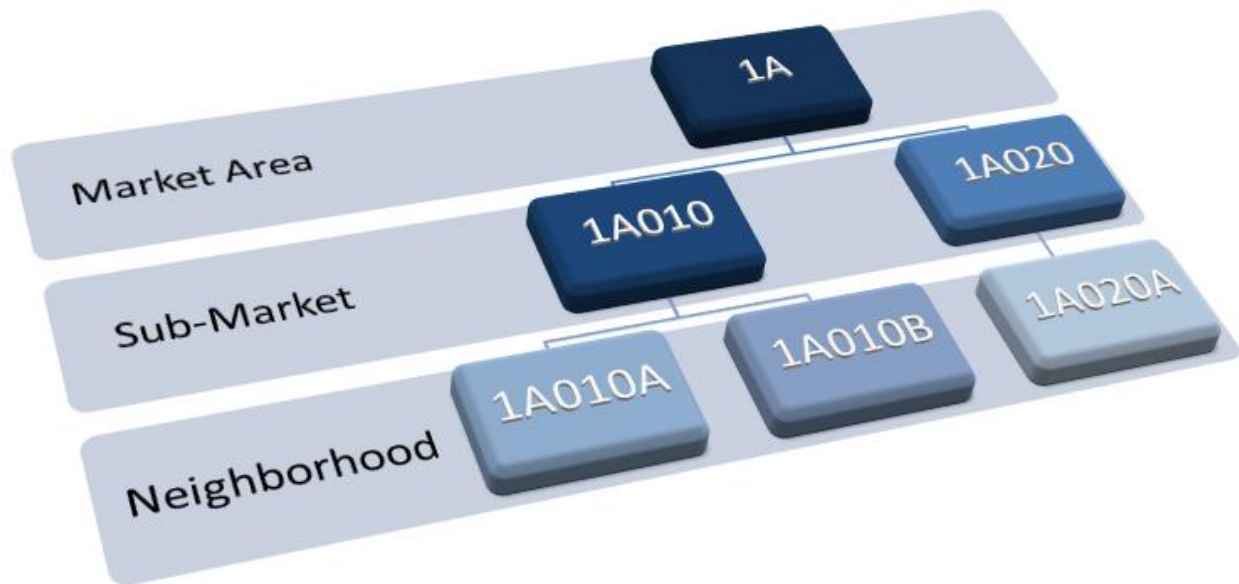
Neighborhood identification and delineation is the cornerstone of the residential valuation system at the district. Most residential analysis work, in association with the residential valuation process, is neighborhood specific. Neighborhoods are visually inspected to verify delineations based on observable 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 January 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.

	2012	2013	2014	2015	2016	2017	2018
Multiple Listing Service (MLS)	21,503	22,853	24,459	23,944	24,000	26,297	27,000
Other Sources	2,655	1,736	1,211	1,149	1,200	985	1,200
Total Sales	24,158	24,589	25,670	25,093	26,437 Projected	27,282 Projected	28,200 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>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>
NEW HOMES	4,561	5,270	4,197	6,160	4,200	6,014	5,500
OTHER PERMITS	10,901	10,154	8,808	8,900	10,200	8,172	9,000
TOTAL	15,462	15,424	13,005	15,060	14,662 Projected	14,185 Projected	14,500 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 Property 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 TAD's jurisdiction. This currently includes approximately 31,000 improved and 12,500 unimproved taxable accounts and 16,500 accounts with various tax exemptions. Commercial real property types generally include multi-family, office, retail, warehouse/manufacturing and various other categories of business related facilities. Tax exempted accounts may include worship centers, hospitals, private and public schools, community and municipal buildings and land. The staff appraisers also value all commercial and rural land parcels. In general terms, the commercial appraisal staff is responsible for establishing market value on any real property for which the highest and best use is determined to be non-residential.

Commercial appraisal assignments are delineated from residential assignments on the basis of an assigned state use code. All accounts in the software are given a "Class Code" that reflects the primary use of the property, as defined by the Texas State Comptroller's Property Classification guidelines. Commercial class codes include the state category AC, BC, C1C, D1, EC, F1, F2, and J. Generally the commercial staff values all commercially improved properties including apartments, vacant commercial land, vacant rural acreage, and the underlying land of improved acreage. 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 commercial appraisal staff collects the property data and appraises using commercial valuation models. Otherwise, these properties are maintained and valued using residential models for purposes of calculating the 10% limitation on increases to the appraised value for a property with a general residential homestead exemption.

Appraisal Resources

Personnel - Staffing details can be found in the budget adopted by the TAD Board for 2019. The real property portion of the Commercial Appraisal Department is organized into three separate divisions or areas of responsibilities. The divisions are Commercial Appraisal, Complex Properties, and Commercial Research/Reporting. The Commercial Appraisal division is staffed with two managers and appraisers. The Complex Properties and Commercial Research/Reporting divisions are each staffed with a manager and appraisers. Clerical staff provides administrative support for each division. 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, three litigation appraisers, and clerical support. Property owners and taxing units may appeal decisions of the ARB to district court. Litigation staff activities include performing value reviews or appraisals, assigning cases and corresponding with TADs attorneys, negotiating settlements, and working with independent expert witnesses prior to any judicial court proceedings. The litigation division also manages other post-ARB remedies including binding arbitration, which is an administrative appeal process that allows homeowners, if the property qualifies as the owner's residence homestead, and owners of real property valued at less than \$5,000,000 to appeal their ARB value to an arbitrator rather than to District Court. Owners also have the right to appeal properties valued at more than \$1,000,000 and have the case heard by a chief administrative law judge with the State Office of Administrative Hearings (SOAH).

Commercial Appraisal and Complex Properties Division

The Commercial Appraisal and Complex Properties Divisions are responsible for valuing all commercial improved real property, vacant commercial land, and vacant acreage within TAD.

The Commercial Appraisal Division is staffed with two Managers, appraiser analysts and commercial appraisers. In addition, clerks and a clerical supervisor are assigned to support all divisions within the commercial department. In the Appraisal division, duties and responsibilities are divided between two workgroups. Each appraiser is assigned to a workgroup or team that is supervised by a Manager. The Manager for each workgroup is responsible for assigning property categories and geographic areas of responsibility to each appraiser in order to complete the various valuation and field tasks.

One workgroup values industrial and office-related categories and establishes the land values for all non-complex commercial properties. This team also works plat/split/merge records changes using a redescribe workflow. The other workgroup values multi-family and retail-related categories and is responsible for building permit data collection using a permit workflow process. They are also responsible for the annual reappraisal field inspection effort. During this field-inspection phase of each reappraisal year, the commercial appraisal staff makes on-site physical inspections and photographs real estate accounts within a designated portion of the county.

The Complex Properties Division is responsible for valuing complex and unique properties as well as properties subject to abatement agreements. This division consists of a Manager, one appraiser analyst, two commercial appraisers and clerical support. Complex properties include golf courses, utilities, railroads, high-rise downtown office buildings, the Fort Worth downtown central business district, the Panther Island redevelopment district, regional and local airports, regional shopping malls and lifestyle centers, hospitals, and possessory interest properties. The Complex properties staff also monitors properties located within designated Tax Increment Financing (TIF) areas. The higher profile complex properties that have a significant impact on the North Texas economy include Hurricane Harbor, Six Flags Theme Park, DFW and Alliance Airport, American Airlines, General Motors, Alcon Laboratories, Facebook, Fidelity Investments, Gaylord Texan Resort and five regional malls.

Research and Reporting Division

The Research and Reporting Division consists of a manager, appraiser analysts, research appraisers and 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 the valuation module and stored in database tables. The database tables are integrated within the appraisal software valuation models. The information is easily accessible for the appraisers to use in the sale model building and calibration process, edit/valuation process, informal discussions, and Appraisal Review Board hearings. Land sales data are processed into the appraisal software and GIS mapping software is used to outline and post the sale data onto the TAD appraisal base maps. This data is stored as a year-based layer within the Geographic Information System.

The Research and Reporting Division, with input from the commercial appraisal staff, is responsible for updating and maintaining the commercial classification manual. This includes the periodic review of building class characteristics data that affects cost, sales and income valuation models. Cost-related data fields are specified and monitored in accordance with the requirements of the integrated MVP cost tables in the CAMA software. The division is also responsible for calibration of the cost and depreciation tables for features. 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 for mass appraisal. For the upcoming reappraisal cycle, this will include the implementation of new regression analysis tools that will be used for development of adjustments and other model calibration needs. 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.

PRELIMINARY ANALYSIS & DATA COLLECTION

Prior to beginning of the valuation activities for an appraisal year, the appraisal department management team 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 other 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 division to identify priority areas for sale and income data collection and any necessary enhancements to the standardized appraisal classification manual.

TAD 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 statutes. In addition, TAD administration and personnel interact and exchange information 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.

Area Analysis

Data on national and regional economic forces such as demographic patterns, regional location 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. Appraisal analysts 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.

Neighborhood Analysis

Commercial properties are generally stratified by locational and economic factors to better analyze and accurately determine market value. The hierarchy of this breakdown is market, sub-market, and then neighborhood. A commercial neighborhood, submarket or market economic area is comprised of land and the commercial properties located within the boundaries of a specifically defined geographic location. (see Appendix E) Every commercial account, as part of its specified appraisal site is coded with a Neighborhood, Sub-market and Market Area identifier. A market area consists of a wide variety of both competing and complimentary property types including residential, commercial, industrial and governmental. Market area descriptions can be based on man-made, political, or natural boundaries. Further market stratification is made at the submarket and neighborhood level to further analyze how physical, economic, governmental and social forces at the local, national and international level influence or affect property values. A neighborhood is the smallest delineation of comparable properties, often described as having homogeneous and complementary land uses. The effects of these market forces, at the neighborhood level, are used to determine the highest and best use for a property, and to more accurately calibrate and assign the appropriate sale, income and cost data in the valuation process.

Commercial Market areas are typically 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 (also 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. TAD-delineated commercial Neighborhood, Sub-Market and Market boundaries closely mirror the areas defined by other generally accepted Commercial Real Estate sources including local and National Commercial Brokerage Firms, MPF Research

(multifamily property), Apartment Listing Network (ALN) and CoStar Properties, a published subscription source of commercial sales. Economic area identification and delineation by each major property use type is a key component in a mass-appraisal, commercial valuation system. All the appraisal software income and sales comparison valuation models are Neighborhood, Submarket or Market Area specific. Economic market areas are periodically reviewed to determine if a revised delineation 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, based on activity in the area and a city's propensity for approving zoning change requests.

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.

In November 2009, the Texas constitution was amended by voters to limit the appraisal of a residence homestead to its value as a residence homestead, regardless of whether its residential use was the highest or best use. This change became effective on 01/10/2010.

"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 appraisal of certain types of property that require a value based on a specific use. The complex properties division manages the special requirements for appraising possessory interests and restricted use properties.

Appraisal Site Classification

An appraisal site consists of a parcel or grouping of parcels recognized by investors in the market as a single property unit. An appraisal site generally 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 that it would sell as one property. A commercial appraiser determines an appraisal site grouping as part of the highest

and best use analysis. The appraiser creates an appraisal site valuation record by identifying the account numbers and other required characteristics data as indicated in the appraisal site class section of the commercial classification manual. The high level criteria that describe the valuation site are otherwise known as Appraisal Site Class Codes. There are currently 119 appraisal site class codes in the commercial manual. An appraisal site class code represents the primary use of the entire property, such as low-rise office, master-metered apartment, or distribution warehouse. An appraisal site may be comprised of several accounts with multiple building classes, such as a shopping center or auto dealership. The Neighborhood Market Area represents the location, submarket or competing market area for the appraisal site property unit. Appraisal Class Codes are necessary and critical for the grouping of similar or “like” properties in the mass appraisal valuation models. Commercial appraisers make market value determinations at both the account or “parcel” level and the appraisal site or “property” level.

Market Analysis

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 operating expenses, expense ratio trends, discount rates and going-in, stabilized and reversion capitalization rate indicators. This data is used to determine market ranges in price, operating costs and investment return expectations.

DATA COLLECTION / VALIDATION

A standardized set of data characteristics for each commercial property in Tarrant County is collected and data entered by the commercial appraisal staff into the appraisal software. This property-specific data drives the software’s valuation modules. 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 appraisers includes sale listings, fee appraisals, actual income and expense data (typically obtained through the appeals 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

Data Collection Manuals

The Commercial Appraisal Classification Manual is the primary source and standard applicable to commercial property data collection and documentation. The commercial manual is utilized to establish uniform procedures for the correct listing of real property by field appraisers. This compilation of data collection guidelines is continually updated, providing a uniform system for listing the multitude of field data elements necessary to describe commercial real properties. All commercial properties located in TAD’s jurisdiction are identified or described according to the manual and the three approaches to value are structured and calibrated based on this identification system. The field appraisers study and use the manuals extensively during their initial training and as a guide in the field inspection of properties. The guidelines in the manual are available in a hard-copy form or in an HTML file available on each appraiser’s PC or portable computer pen tablet. Most of the data collection that is described in the manual is represented in the appraisal software through a series of drop-down selection lists. Standardized field descriptions are developed and used to describe commercial property at both the parcel and the appraisal site level. For example, one key characteristic of a property, at the individual parcel or account level, is building class or use. This is calibrated to the Marshall and Swift MVP component called “building occupancy”. TAD employs the use of 103 different building classes (uses) to describe the various types of commercial structures. To assist the appraiser in determining effective year of construction for a structure, the manual also contains data collection guidelines for various site and ancillary improvements and recommended depreciation guidelines based on condition.

Commercial Building Permits

Every city within TAD’s jurisdiction has a system of issuing building permits to property owners in order to ensure that building code standards are followed for all new construction or major remodeling projects. Permits may also be issued for repair or replacement of plumbing, electrical, HVAC, roofing, foundations, canopies, interior or exterior finish, parking lots, and ancillary structures. On a monthly basis, copies of those permits are either forwarded to TAD or downloaded by TAD staff from various city websites. Permits are matched to a corresponding commercial account and pertinent permit data is entered into the appraisal software. The Commercial appraisers field inspect and measure the permitted properties as part of an annual reappraisal work plan assignment or during the building permit work cycle. Changes to property characteristics, as a result of the completed permit work, are recorded at both the account and Appraisal Site level. Value added to the roll from new construction is tabulated and reported to each taxing units for the use in their effective tax rate calculation. The following grid shows historic and projected Commercial permit activity:

Number Of Permit Issued For						
Appraisal Yr.	2015	2016	2017	2018	2019**	2020**
New Construction	312	375	567	552	500	500
Other Commercial Permits	3,460	2,963	2,383	3,023	3,000	3,000
Total # of Permits	3,772	3,338	2,950	3,575	3,500	3,500
Total Value of Permitted New Construction (taxable)	\$938,855,169	\$1,043,570,174	2,103,332,563	2,530,118,272	\$1,750,000,000	\$1,750,000,000

**Projected **Projected

Comparable Sales Data

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 entered by research clerks into the Rights Transfer Sales Detail screen, in the Records module, which already contains County deed filing information initially captured by Tarrant Appraisal District's Deed-Records staff. The clerical staff then assembles photos, maps, deeds and other supporting information to create a detailed information packet about each sold property. The research appraisal staff reviews the compiled sale packet and verifies that all the physical and income characteristics, for the sale, are accurately represented in an appraisal site record in order to create a "snapshot" of the appraisal site and sold parcels as of the time of sale. Efforts are made to verify sale prices that obtained from third party sources. A research appraiser may also conduct a field inspection to verify the accuracy of the existing property characteristics data and attempt to determine if the property characteristics have changed since the sale date. Property, location and financial data is documented and entered in the appraisal software sale entry record. A final quality control review of the recorded and entered data occurs and the sales data is then released to the appraisers and for the purpose of mass appraisal valuation. Sales can be viewed in the appraisal software individually, in the records 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 temporarily maintained in files in the research area. This vast amount of documentation is later scanned as part of a workflow process and archived into the TAD imaging application. Property owners may request access to the sales data used to value their individual properties and all non-private entity source data is available to the public under provisions of the Open Records Act.

Income and Expense Data

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 an image-processing workflow application based on property type. The data is retrieved by appraisers and processed into the appraisal software's Reported Income interface. The district also subscribes to several real estate publications, such as Apartment Listing Network (ALN) and CoStar Properties that provide individual summarized income data within each specified submarket or improved market area. Data is also obtained via public Internet web postings from numerous online news sources and real estate-related business postings and publications. Pertinent income data includes contract and market rental rates, asking rental rates, physical and economic vacancies, tenant reimbursements, operating expenses, capitalization rates, discount rates, lease up projections, and finish out costs.

Sources of Commercial Data

Property specific data is gathered as part of an on-site field inspection. The majority of cost related data is provided by either Aumentum's integrated MVP tables or from Marshall Valuation

Services “Brown Book” or “Commercial Estimator” products. Closing statements, actual 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 TAD Records division should receive 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 of 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. TAD also subscribes to CoStar, a 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, the Texas State Comptrollers Property Tax Division and other knowledgeable parties. The research staff attempts to confirm and verify all data from secondary sources.

The following grid identifies historic and projected number of commercial sales by source type. Unlike the majority of states, Texas laws do not require mandatory disclosure of sale prices. TAD Commercial sales data is provided by voluntary disclosure or purchased from third party vendors.

Sources Of Commercial Sales	2013	2014	2015	2016	2017	2018*
Closing Statements	181	259	200	279	240	35
CoStar Properties-Web Publications	268	240	163	172	267	60
Multiple Listing Service (MLS)	6	132	88	184	132	41
Fee Appraisal Sale Comparable	14	17	13	3	3	5
Grantor/Grantee Survey Letters	325	109	0	197	222	62
Other	11	20	41	59	24	3
Total Commercial Sales	805	777	505	894	888	206

* As of report date

VALUATION APPROACH/FORMULAS (Model Specification)

The Aumentum Valuation module 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 specific 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.

Cost Approach Models

The very basic valuation model is **Market Value=Land Value plus Improvement Value**. This model represents the formula for the cost approach to value. 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.

Improvement Valuation

Cost model specification involves categorizing or grouping commercial improvements by construction type or use. The Commercial Department considers the primary function of a structure when assigning one of the 103 building class designations to each building in order to represent the various types of commercial property construction. For each building class, key characteristics are used to describe a typical or benchmark property. The characteristics include construction quality, construction class (framing), floor level and a number of key structural elements such as interior finish, roof type, roof materials, heating/cooling, exterior walls, foundation, story height, building shape, and number of stories. The Commercial Valuation Manual contains a thorough description and a list of these specific characteristics for each property class. Photo examples of each building class are provided to assist the appraisers in making class determinations. Additional site improvements or features for each building class, such as concrete paving, light standards, canopies, garages, and storage buildings are also specified and valued using the cost approach. Over 100 ancillary improvement types are defined and valued in the cost model.

Other key data necessary for cost valuation includes gross and net building areas, year built and effective year of construction (EYOC), percent and quality of finish-out, percent of completion, and property condition. A base cost rate is associated with each commercial building class. An improvement value or replacement cost is then computed by multiplying the base rate times the structures gross building area. An improvement can have more than one building class.

The total improvement value for an account represents the sum of the depreciated improvement value of all taxable objects plus any value for the additional site improvements/features associated with the account.

Depreciation

Accrued depreciation is the sum of all forms of loss affecting the contributory value of the improvements. It is the measured loss against replacement cost new taken from all forms of physical deterioration, functional and economic obsolescence. Accrued depreciation is estimated and developed based on losses typical for each property type at that specific age. Physical depreciation is expressed as a percentage that is computed and subtracted from estimated replacement cost value. This percentage rate is extracted from depreciation tables and is dependent on the class, condition, effective age and economic life of each improvement. Individual or market-derived determinations are made for functional and economic depreciation rates based on property of market specific conditions. Models for these can be built and applied

to one or many properties impacted by the same deficiency. The sum of the three rates is utilized to compute a depreciated improvement value.

Land Valuation

On an annual basis, commercial land values are analyzed to compare appraised values with recent sale prices and to verify uniformity. The appraisers in the land workgroup are assigned a specific geographic area to collect land characteristics data and determine land values. An assigned land area may contain approximately 9,000 accounts and may include one or more land submarket areas. The parcel count per appraiser may vary depending on the land-use density and the total size of an assigned area. A densely populated urban land area generally has more accounts than a less populated rural assignment. The Complex Properties Section manages the land valuation for the 5,600 complex property accounts.

During the land reappraisal, the appraisers review sales to develop or adjust base land rates on per acre or per square footage basis. A land base rate, also known as a site rating, represents the unit value for a “benchmark” land parcel whose property characteristics are described by a particular size, use, shape, zoning, topography, location, and other characteristics. Properties within a competing area that differ from the benchmark will be valued using the base rate and then adjusted for those characteristics that differ from the benchmark property. Percentage based adjustment factors and adjustment reason codes are applied on individual properties based on corner influence, depth and shape of site, easements across site, visibility, and other factors that may influence value.

The land value for each account is computed by multiplying the land size by the adjusted land rate. The depreciated improvement value is added to the land value to compute a total cost approach value at the account level. For an appraisal site, the cost approach value represents the sum of the cost for all accounts associated with the site.

Sales Comparison Approach Models

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 for estimating land value and also in comparing sales of similarly improved properties to parcels on the appraisal roll. Sales of similarly improved properties can also 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 ratio studies, which afford the appraiser an excellent means of judging the present level and uniformity of the appraised values.

The formula for the sales comparison approach is **Market Value=Sale Price of Comparable Properties plus or minus adjustments** (for differences between the comparable and the subject). In this model, market value is a total amount without a separation for improvement and land values. Commercial sales modeling begins by processing and storing extensive physical and financial data for each commercial sales transaction. Data related to the deed information, such as sale price, sale source, value at time of sale and income at time of sale is collected in the Records Module in Sales Information form. Additionally, almost every physical

attribute associated with the sale parcel is captured in the Valuation module and available as a variable for sales modeling. This amount of information is necessary to determine comparability and adjustments factors. The sales comparison approach requires an adequate amount of sales data to be accurate. Some commercial property categories cannot be valued with this technique because of a limited amount of verifiable sales data.

Sales model specification involves the process of designing the model based on economic factors, appraisal theory and market analysis. Market variables are determined based on the characteristics that influence value in the local marketplace. The commercial mass appraisal sales model is specified or defined based on several standardized property characteristics or comparison fields and the commercial division has created over 40 variables for use in this process. While some fields are for descriptive purposes such as Appraisal Site number, legal description, sales price and property address, the majority of the fields serve as interactive variables that more accurately define market value for a specific type of property. The variables provide a means of stratifying or grouping sales by class, age, size, location and other key attributes that influence value. The highest levels of model specification are appraisal class and neighborhood. Other key levels of stratification are effective age, net leasable building area, overall rank, Mapsco or property address, physical occupancy, average rents per square foot and condition. The model is specified to select comparable sales that are the most similar to the subject when considering these key variables.

Before the models are defined, the appraisers study and analyze sales using various analysis tools contained in the Valuation Module, including Visual Analysis, GIS Analysis and Sales Ratio Analysis. This market analysis aids in revealing patterns in value that vary due to location, size, age, etc. The appraiser determines which Neighborhood Market Area combinations have enough credible sales data to create and calibrate a sales model. The analysis also provides a means for establishing adjustment amounts, value ranges and weightings for each comparison criteria on a property type basis. For example, sale analysis may reveal that wide ranges in net rentable area may not have as much influence on value for high-rise office sales as compared to apartments. The appraisers also use various forms of statistical analysis in Excel to measure and predict many market driven value indicators. Additional regression tools will be added to this analysis process in 2019.

Income Approach Modeling

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 leading value indicator. The basic formula for the income approach is **Market Value= Net Operating Income Divided by Overall Cap Rate**. This is also known as “Direct Capitalization”, which is a generally accepted appraisal technique used to convert one year’s stabilized income into an indication of market value. The income approach module provides the mechanism to capture and specify a property’s income characteristics using three levels or techniques known as “actual”, “default model” (market) and “pro forma”. These income

calculations are laid out in three separate sections in the income module. The income formula is the same for each income approach technique but the data used to calibrate or populate each technique may differ. A thorough analysis of both actual income and default model income data is used to develop an indication of market value represented in the income pro forma calculation. The pro forma allows the appraiser to blend market rate comparable income data with actual income characteristics that are property specific. The definition of market value denotes that appraisals are based on fee-simple interest. Therefore, income parameters are based on market data to ensure that TAD is not appraising based on the leased fee interest. Commercial properties should not be appraised using above or below market rental data in the application of the income approach for property tax purposes, unless stipulated by a special appraisal provision in the tax code.

The key model fields in the income approach formula include potential gross rent, physical vacancy, economic vacancy, secondary income, total operating expenses, net operating income and total tax rate, and capitalization rate.

The income approach formula is generally expressed the following way. A brief definition of each component of the formula is listed below.

Potential Gross Rent

Minus Vacancy & Collection Loss

Equals Effective Gross Rent

Plus Secondary Income

Equals Effective Gross Income

Minus Operating Expenses

Equals Net Operating Income

Then **Net Operating Income/Overall Cap Rate=Value**

Potential Gross Rent (PGR) - Total economic or market rent at 100% occupancy; Usually expressed as an annual amount on a per square foot or per unit basis.

Vacancy and Collection (V & C) - Loss in rental income because of physical vacancy, bad debt or economic rental concessions; often expressed as a percent of PGR; based on market cycles and trends.

Effective Gross Rent (EGR) - Rental Income after subtracting vacancy & rental loss from potential gross rent.

Secondary or Other Income - Income, other than rent, that is received from concessions; laundry rooms, parking, storage area rental, electronic communication roof space rental, and other sources related to ordinary operation of a property. (Secondary income can be expressed as a percentage of PGR or EGR or dollar amount per unit of measure.)

Effective Gross Income - Amount of actual income received from rent and secondary sources.

Operating Expenses - Expenses necessary to maintain a cash flow from the real property (not from the business). Typical expenses include management, utilities, property insurance, property taxes, repairs and maintenance, etc. This dollar amount can also be expressed as a percentage or ratio that represents total expenses divided by effective gross income.

Net Operating Income (NOI) - Income remaining after subtracting operating expenses from Effective Gross Income. This amount is income before debt service, property depreciation, personal income taxes, amortization, or interest payments.

Overall Capitalization Rate (OAR) - Rate used to convert income into value. An overall rate represents the requirements of discount (return), recapture and effective tax rates for the whole property. This is expressed as cap rate plus tax rate. If the tax rate is “loaded” into the cap rate, then the amount of real estate taxes is removed as an expense item.

Actual income data is property specific, but income characteristics derived from these “actuals” are generally representative of typical, market-based characteristics for similar income-producing properties. Standardized or “default income models” are developed by grouping these actual income comparable based on specific comparison or search criteria. The groupings provide a results set of income parameters that are analyzed and calibrated to create a pre-defined or “defaulted” income model. The income parameters that are modeled include potential gross rent per square foot, economic vacancy percent, other income per square foot, expenses per square foot and as a percentage of potential gross rent.

Physical property attributes and property income/expense comparison fields are used to group and develop income models. Model variable criteria can vary by property type. The variable criteria provide a means of stratifying or grouping sales by class, age, size, location and other key attributes that influence income characteristics. The highest level of model specification is by Neighborhood Market Area, Appraisal Class, building class, effective age range and building size range. Other major search fields may include average unit size, lease type, Mapsco location, number of units, rent per square foot, income level and property rank. The TAD commercial staff strives to develop a model for every improved category that has an adequate amount of income data. Each default model is then utilized in the mass appraisal of properties with the same Neighborhood Market Area/Appraisal Class/age and size range. There are approximately 50 general default income models with property-specific variable specifications used in the valuation over 21,000 improved commercial appraisal sites.

During the 2009 legislative session, Section 23.24(b) was added to the Texas Property Tax Code to address specific circumstances where an income approach valuation may take into consideration both personal property and real property components. Effective as of 01/01/2010, the appraisal district may not separately appraise any personal property valued, as a portion of the income of the real property, and the market value of the real property must include the

combined value of the real and personal property. With a few exceptions, TAD's real property values for apartments and motel/hotels reflect compliance with this new mandate.

VALUATION PROCESS (Model Calibration)

Model calibration involves the process of estimating and 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. These are represented in three separate modules in the commercial system. The software developed to create the commercial valuation models has been specified according to appropriate Uniform Standards of Professional Appraisal Practices and International Association of Assessing Officers mass appraisal standards and techniques. On an annual basis, adjustments or calibrations are made to reflect local market trends, new construction procedures, materials and/or costs, new improved market area delineations, current sale and market income factors 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 & Depreciation Schedules

The cost approach to value is applied to all improved real property utilizing the comparative unit or square foot method to determine replacement cost new. Replacement cost new should include all direct and indirect costs, including materials, labor, supervision, architect and legal fees, overhead and a reasonable profit. The Aumentum software includes integrated MVP commercial cost tables. Application of the comparative cost unit for each building class involves classifying building and features according to the software and per the Tarrant Appraisal District classification manual guidelines. Actual cost data is also collected and used to test classification categories and depreciation rates. MVP contains base cost rates for each building class (use) and represents the replacement cost per unit for a benchmark property for each class. Date and location modifiers are included to adjust cost data to reflect conditions in a specific market and changes in costs over a period of time.

Additional cost modifiers for each building class can be developed to adjust individual properties for construction components that differ from the base property integrated cost model. These are applied using adjustment models with the CAMA Software. Modifiers can be developed for additional physical deficiencies or additives that are not included in the adjusted base cost.

The process of updating the commercial classification manual began in July of 2014 and continues to undergo refinement. Field data lists, codes and features table rates are reviewed periodically for update as needed. The research staff employees several methods to determine table adjustments. MVP and Marshall Valuation Service provides cost-trend factors for indexing existing costs as well as formula driven cost calculations. This data will be reconciled with

actual cost data provided by local property developers to determine which cost rates require adjustments which can be modeled.

Accrued depreciation is estimated and developed based on losses typical for each property type at that specific age. Physical depreciation is the loss in value due to wear and tear and exposure to natural forces. For each major class of commercial property, integrated physical depreciation tables have been employed based on physical condition and the building life expectancy. These schedules are based on improvements with a 15, 20, 30, 40, 50, 60 or 70-year economic life expectancy. These schedules are tested annually using sales of relatively new properties to ensure they are reflective of current market conditions. The actual and effective age of all improvements are noted in the appraisal software. 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. In addition to age, physical depreciation is also based on five condition ratings, poor to excellent that relate to the level of property maintenance. These condition ratings are further described in the Commercial Appraisal Classification Manual.

Additional depreciation can be applied to a property or a group of properties by building an adjustment model. These adjustment models are typically applied to a specific property type or location based on actual and market data or they can be developed via ratio studies or other market analyses. Accuracy in the application of the MVP cost schedules, condition ratings and depreciation schedules will usually minimize the necessity of this type of an adjustment factor.

Sales Comparison Default Model Calibration

The commercial sale models are calibrated by populating the various comparison fields (variables) with specific sales search criteria. The goal of accurate calibration is to return a group of sales that are comparable to the subject property and require the least amount of adjustments. This is accomplished by accurately populating several of the 40 model comparison or variable fields with accurate and category specific search and display criteria. Examples of variables used in calibration include Neighborhood Market Area, Appraisal Site Class, net leasable area, gross area, number of units, sale date range, Mapsco, effective age, ISD, land size and land to building ratio. The weight placed on the model characteristics can vary by property type. For example, the field “average unit size” is more critical in apartment modeling but not considered as a key variable for office model specification.

Prior to the final value edit process each year, commercial managers and supervisors analyze all improved sales and determine which Neighborhood Market Area/ Appraisal Class/age/ size variables and variable configurations are essential in calibrating the sale modeling tool in the Valuation software. Through accurate model specification, Appraisal Site properties within each Neighborhood Market Area that have similar physical, economic and location characteristics will be valued using similar market-driven sales indicators. There is a general valuation sales model engine that is capable of valuing any improved commercial appraisal site, where sales are adequate to measure the market. This adequacy is statistically tested up front.

using analysis tools in the software, including sale ratio analysis. The general sale comp model is calibrated such that key variables are considered and weighted (indexed) for the subject and comps. Additionally, adjustments to sales are developed and applied, based on the subject properties attributes. In the future, regression testing will be employed to further assist the commercial appraisal staff in adjustment development. In Valuation sales comparable model application, the resulting comp grid will generate the most comparable adjusted sales and return an indicated value for the subject properties. The sales model can be applied in mass per property type, per neighborhood or can be calibrated to run for a single property.

After the sales comparison models are applied and the sale grids are produced the appraiser has the ability to review the results, per appraisal site, to determine if the sample is sufficient and representative of the subject appraisal site. If the sample is either not sufficient, or too large to be representative, the appraiser can recalibrate and re-run the sales model, or deselect less comparable sales to return a modified sales sample. The appraiser can also add or override adjustments, as a percentage or dollar amount to individual sales, to account for differences between the sale and the subject.

Based on the weighted and adjusted sales, the application displays the average and median per unit prices and computes a total sales comparison value indication. To complete the appraisal process, the appraiser reviews either the median value, the average value or the indicated value or value range. The appraiser then has the ability to override the indicated value for the subject property as a final step in the overall reconciliation process.

Income Model Calibration (Actual, Market, Pro Forma)

Property owners often provide TAD with rent rolls, operating statements and other income documentation that reflect the actual income characteristics of a given property. This type of data is based on actual tenant or contract rent received and actual expenses incurred by the owner. The information is analyzed and entered into the “reported” income tool provided in the Valuation appraisal software. Each income record is tied to an “Income Statement” within the application. This year-based data is generally representative of the entire appraisal site or Neighborhood Market Area level but a rent space entry option also exists to capture data at the building class and leasing space level. The TAD commercial research staff processes an average of 2,200 income-related statements each year. The entry of this property-specific rental and expense data serves to assist in calibrating income models for each given property type. The information can also be utilized in calculating Direct Cap and Yield Cap income proformas for individual appraisal sites. Income from third-party or contributed sources that is not considered “actual” income is labeled as pro-forma data. This type of income can also be processed into reported income, with the source of information identified in the income statement record. Asking rental data can also be similarly captured and stored.

Commercial property income models are calibrated by populating the various income variable fields with comparable income and expense data. There is a lease comp analysis tool in the software that assists the appraisal managers and research staff in determining income

parameters based on key market-driven income comparability factors. The goal of accurate model development is to gather and analyze a grouping of market lease comparables that can be used to determine income parameters for a specified Neighborhood Market Area, considering Appraisal Class, age, rank, income level and size. This is accomplished by analyzing income data using both data and tools provided in the software as well as gleaning additional market data from reliable commercial real estate sources such as Co-Star, Loopnet, ALN, Axiometrics, Commercial broker web sites, local fee appraisers, SEC documents, Fannie Mae, Freddie Mac, Real Estate Center at Texas A&M and other market publication.

Commercial Income models are calibrated with the appropriate income parameters per property type and Neighborhood. For example, in addition to Neighborhood Market Area, Appraisal Class, age and size range criteria, an appraiser may also calibrate an apartment model for the following:

<u>Comparison Field</u>	<u>Calibrated Search Criteria</u>
Rank (qualitative)	
Income Level	
EYOC	Greater than 1995
# Of Units	Greater than 200 units
Economic Vacancy	Less than 15%
Rents per SF	Greater than \$10.00
Expenses per SF or as a Percentage of Income	

The appraisal software income application assists in analysis of the market rent comps through analysis tools such as Lease Comp Analysis, Visual Analysis, and GIS analysis. Advanced regression tools will be implemented in 2019 to further assist in the income analysis process.

A default income model for each Neighborhood Market Area/Appraisal Class/Building Use is then calibrated using all sources of market related data. The default income model fields include those that are defined include potential gross rent or PGR, economic vacancy percent, other income, expense per square foot or percent of PGR, cap rate, rent type, age range and size range.

Pro Forma Income Valuation

A pro forma is an operating statement used to project probable gross income, operating expenses, and net operating income based on specified market derived assumptions. The direct capitalization income approach is based on projecting rent and expense quantities that reflect how a typical, prudent property owner would manage the property. The cap rate is selected based on the projected quantity, quality and duration of these income characteristics of a property. These projections are defined or calibrated in the pro forma portion of the income module. Adjustments to actual and model income data are developed and applied in the pro forma to reflect differences between a subject property's performance versus a typical

property's operating performance or cash flow characteristics. Adjustments for income differences may relate to physical, functional or economic influences that affect a property's ability to generate income. Market-based similarities or differences may be represented in the pro forma model through application of higher vacancy or expense ratios, differences in capitalization rates or through application of a lease up cost adjustment. Reconciliation of actual income and model market-driven data is used to populate the income pro forma and results in a final indication of market value for each property.

Final Valuation Summary and Reconciliation

Based on the market data analysis and the methodology described in the cost, income and sales approaches, the various models are calibrated and values are developed for each commercial property. The cost approach mass appraisal model is applied to every improved property. Additional valuation indicators may be developed and applied using the sales comparison and income approaches, depending on the property type and availability of data. The total appraisal site value, resulting from the execution of each approach, is displayed on a Value Correlation/Reconciliation Screen. The final valuation of a property is estimated based on reconciling these indications of value considering the weight of the market information available for evaluation and analysis in these approaches to value.

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 calculated for each property type with available sales data. These summary statistics including, but not limited to, the weighted mean provide the appraisers an analytical tool by which they determine both the level and uniformity of appraised values 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 values.

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. Appraisers, based on the sales ratio statistics and designated parameters for valuation update, make 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 ratio of market value is at an acceptable level.

Potential gross rent estimates, occupancy levels, secondary income, allowable expenses (inclusive of non-recoverable and replacement reserves), net operating income and

capitalization rate and multipliers are continuously reviewed. Income model estimates and conclusions are compared to actual information obtained on individual commercial and industrial income properties during the appeal and protest hearings process, as well as with information received from published sources and area property managers and owners.

INDIVIDUAL VALUE REVIEW PROCEDURES

Field Review

The date of last inspection, extent of that inspection, and the TAD appraiser responsible are listed in the appraisal software. If a property owner disputes the District's records concerning this data in a protest hearing, data may be altered based on the credibility of the evidence provided. Normally, a new field inspection is then required to verify this information for the current or for the next year's valuation. In addition, if a building permit is issued for a particular property indicating a change in characteristics, that property is added to a work file for review and field inspection.

A major effort is made by appraisers to field review 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 on as many properties as time and resources allow. Additionally, the appraisers frequently field review subjective data items such as building class, quality of construction (known as cost modifiers), 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 between economic areas. While in the field, the appraisers make an effort to inspect sold and unsold properties for comparability and consistency of values.

Office Review

Office reviews are completed, as authorized by the International Association of Assessing Officers standards, on properties subject to field inspections and are performed in compliance with the guidelines required by the existing classification system. Office reviews are typically limited by the available market data presented for final value analysis. The appraisers may utilize aerial photography as a means to verify building characteristics and location without an on-site field inspection. These reviews summarize the pertinent data of each property as well as comparing the previous value to the proposed value conclusions of the various approaches to value. These evaluations and reviews show proposed value changes; income model attributes or overrides, economic factor (cost overrides) and special factors affecting the property valuation such as new construction status, and a three years sales history. The three-year sales history is required by the Uniform Standards of Property Appraisal Practices (USPAP) for non-residential property. The appraiser may review methodology for appropriateness to ascertain that it was completed in accordance with USPAP or more stringent 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. Each appraiser's review is limited to properties in their area of responsibility by property type (improved) or geographic area (commercial vacant land).

Once the appraiser, supervisors and managers are satisfied with the level and uniformity of value for each commercial property within the appraiser's area of responsibility, the estimates of value are prepared to send a notice of proposed appraised value. Each parcel is subjected to the value parameters appropriate for its use type.

PERFORMANCE TESTS

Sales Ratio Studies

The primary tool to measure appraisal performance is a ratio study. A ratio study compares appraised values to market values. Sales ratio studies are an integral part of estimating equitable and accurate market values, and ultimately property assessments for the taxing jurisdictions. The primary uses of sale ratio studies include the determination of a need for general reappraisal; prioritizing selected groups of property types for reappraisal; identification of potential problems with appraisal procedures; assist in market analyses; and, to calibrate models used to estimate appraised values during valuation or reappraisal cycles.

TAD has adopted the policies of the International Association of Assessing Officers IAAO STANDARD ON RATIO STUDIES, circa July 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.

On an annual basis, appraisal managers analyze the results of the previous year's Property Value Study that is conducted by the Property Tax Division of the State Comptroller's Office. Commercial Research also produces internal ratio reports at various times during the annual appraisal cycle.

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 classified properties by property use type such as apartment, office, retail and warehouse or special use. The objective to this evaluation is to determine appraisal performance of sold and unsold properties. Appraisers compute the average unit prices of sold properties and the average unit appraised values of the same parcels to develop a comparison of average value changes 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 sales and equity studies are performed prior to final appraisal and generation of notices of proposed appraised values.

Business Personal Property, Utilities & Minerals Valuation Process

INTRODUCTION

Appraisal Responsibility

The Business Personal Property, Utility and Mineral Department (BPP) of TAD is responsible for developing fair and uniform market values for business personal property, utility and minerals located within the district. There are several different account types appraised: (1) standard business personal property, (2) leased asset/special property at multiple locations, (3) commercial and business aircraft, (4) special inventory, (5) “J” State Code utility properties and (6) mineral accounts (which are real property but the valuation is contracted out and managed by the department).

Appraisal Resources

Personnel – The BPP staff consists of a department director, appraisal manager, research manager, valuation analysts, valuation technicians, appraisers, senior appraisers and a clerical staff with a clerical supervisor and support clerks. The BPP Director reports to the Executive Director/Chief Appraiser.

Data – A common set of data characteristics for each account in the district are collected by appraisers in the field, by phone, and other pertinent sources and are entered into the TAD computer system. These assigned property characteristics can be used in the CAMA system to select a preliminary account value.

Additionally, a third party appraisal firm that values minerals and certain utility properties gathers data from the Texas Railroad Commission and other proprietary sources.

VALUATION APPROACH (model specification)

Business Classification Code Analysis

Due to the highly mobile nature of business personal property, specific geographic market areas are not delineated. However, numeric business classification codes are used as the basis for categorizing and valuing business personal property accounts. TAD utilizes the North American Industry Classification System (NAICS) for classifying and identifying business categories. For a listing of NAICS codes, please refer to appendix F.

NAICS code identification and delineation is the cornerstone of the business personal property valuation system. Analysis work completed in association with the valuation process is specific to each NAICS code. These codes are delineated based on observable aspects of homogeneity and periodically reviewed to determine if revision is necessary.

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 maximally productive. The highest and best use of business personal property is generally its current use. In the rare occasion highest and best use is different than its current use; notations will be contained within the individual account records.

DATA COLLECTION / VALIDATION

Data Collection Procedures

Appraisal and data collection procedures are maintained in the Business Personal Property Manual and are supplemented with work memorandums as needed. Procedures are reviewed and revised to meet the changing requirements of field data collection. While a physical recheck of every business is not done annually due to time and taxpayer availability restrictions, business personal property appraisers reappraise all businesses each year through various discovery means and resources. Also, since business owners are required to render annually, appraisal staff rely on this data as well.

Sources of Data

Standard Business Personal Property Account

District appraisers collect new data via an annual reappraisal. Various discovery methods such as internet searches, Texas Department of Transportation commercially registered vehicle listing currently provided by InfoNation, sales tax permit listings, and local occupancy permits

are also used during the reappraisal. Newspapers, business publications, business owners, and district residents provide discovery information and other useful facts related to discovery and 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. Property owner survey letters, on-site inspections and the renditions of lessees are sometimes used to supplement this information.

Commercial and Business 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 and business 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 market value. Owner renditions (and when necessary the Bureau of Transportation Statistics website) are then referenced for aircraft allocation.

Special Inventory

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 used for discovery and valuation of special inventory accounts. Copies of annual declarations are maintained by TAD. Alternate discovery methods may sometimes be used as described in the Standard Business Personal Property Account section.

Certain Utility, Pipeline and Mineral Accounts

TAD contracts with a third party appraisal firm for certain appraisal assignments such as electric power plants, electric distribution systems, telecom systems, pipelines and oil and gas mineral accounts. Uniform Standards of Professional Appraisal Practices (USPAP) certification and biennial reappraisal plans are provided to TAD through the third party appraisal firm. A copy of the vendor’s 2018-2020 reappraisal plan is included in the addenda to the TAD report (See Appendix C). Other utility accounts not handled by the third party appraisal firm are worked by TAD appraisers.

VALUATION AND STATISTICAL ANALYSIS (model calibration)

Cost Schedules

Research specialists develop cost schedules according to NAICS. Cost data is analyzed from property owner renditions, Settlement and Waiver of Protest documentation, and Appraisal Review Board (ARB) hearing evidence. Value models are updated as necessary to reflect changing market conditions and are presented exclusively in a cost per square foot format.

Depreciation Schedule and Trending Factors

While all three approaches to value are considered, TAD's primary approach to the valuation of business personal property is the cost approach. The replacement cost new (RCN) is either obtained from property owner reported historical cost or from TAD developed valuation models. The "percent good", or remaining economic life, is considered to recognize the trend for changes in cost factors.

Depreciation schedules are reviewed annually and adjusted on an as needed basis. Any revisions are then adopted and their use is reflected in all of the calculations for that property. Application of this schedule ensures that market values are uniform and equal.

Computer Assisted Mass Appraisal (CAMA)

The two main objectives of the CAMA valuation process are to (1) analyze and adjust existing Business Classification models and (2) develop new models for business classifications not previously integrated into CAMA. Models are created and refined using 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 that tax year.

The data sampling process is conducted in the following order 1) prioritizing NAICS codes for model analysis and 2) compiling the data and developing the reports. The models are built and adjusted using software specifically developed for this purpose. The typical cost per square foot is determined by a statistical analysis of the available data.

Standard Business Personal Property Account

CAMA model values are used in the general business personal property valuation program to estimate the value of new and/or existing accounts for which a property owner's rendition has either not been received or not used to estimate a value. Historical values are used to establish review 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 historical value by the valuation program. If the value being tested is within an established acceptable percentage tolerance range, 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 depreciation schedules mentioned above. If the asset to be valued in this category is a vehicle, then NADA published book values may be used.

Commercial and Business Aircraft

Valuation is accomplished by referencing the Aircraft Blue Book Price Guide (Winter Edition) and the Airliner Price Guide. The Texas Property Tax Code has a specific methodology for the valuation and/or allocation of all aircraft.

Special Inventory

The Texas Property Tax Code provides a specific methodology for valuing this category of property. 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. The appraisers can also review the monthly statements filed by the property owner throughout the previous year to compare to the declaration. In the absence of an annual declaration and/or the monthly statements, similar businesses that have filed declarations are identified and compared, with appropriate adjustments, to the subject property to establish an estimated market value.

INDIVIDUAL VALUE REVIEW PROCEDURES

Office Review

Standard Business Personal Property Account

A BPP valuation computer program identifies accounts in need of specific review based on a variety of conditions. Property owner renditions, accounts with field or other data changes, accounts with prior Appraisal Review Board hearings activity, newly established business accounts, and Business Classification value model changes are all considered. The accounts are processed by the valuation program and pass or fail preset tolerance parameters by comparing appraised values to historical information. 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 may require reformatting before they can be loaded to the account. The BPP clerical staff or an appraiser enters accounts that render via hard copy into a spreadsheet for importing. After data matching and 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 notice of appraised value.

Commercial and Business Aircraft

The commercial and business aircraft accounts are simultaneously valued and reviewed with rendered data and third party market value data.

Special Inventory

TAD periodically reviews records for dealers without a current declaration on file and they are contacted to advise them of their legal filing requirements and to provide TAD with the most current valuation/review data available. Tarrant Appraisal District receives assistance from the Tarrant County Tax Assessor-Collector's office in this process by both speaking with dealers and providing data to the appraisal district.

PERFORMANCE TESTS

Ratio Studies

Every other 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 measure 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 determined.

LIMITING CONDITIONS

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

TAD appraisals are prepared exclusively for ad valorem tax purposes as specified in the Texas Property Tax Code. Jurisdictional exceptions may apply where compliance with part or parts of USPAP is contrary to law or public policy applicable to TAD’s appraisal assignment.

The property characteristic data upon which the appraisals are based is assumed correct. Exterior inspections of the property appraised are performed as staff resources and time allowed. Some interior inspections of property appraised are performed at the request of the property owner or as requested by the district for clarification purposes and to correct property descriptions.

Validation of sales transactions is attempted through questionnaires to buyer and seller, telephone survey and field review. In the absence of such confirmation, sales data obtained from vendors is considered reliable.

See Appendix B for a list of staff providing significant assistance to the person signing this certification.

Certification Statement:

"I, Jeffery D. Law, Chief Appraiser/Executive Director for Tarrant Appraisal District, solemnly swear that I have made or caused to be made a reappraisal plan for Tarrant Appraisal District for the 2019/2020 tax years as required by law."



Jeffery D. Law
Chief Appraiser/Executive Director

Appendix A. 2019-2020 Proposed Calendars of Key Activities

<u>Projected Date</u>	<u>2019 REAPPRAISAL – RELATED ACTIVITY OR EVENT</u>
July	<ul style="list-style-type: none">• Appraisal Review Board Approves 2018 Appraisal Records To Create Appraisal Roll• Chief Appraiser Certifies 2018 Appraisal Roll To Taxing Units• Chief Appraiser Prepares 2018 Mass Appraisal Report
August	<ul style="list-style-type: none">• Begin 2019 Appraisal Field Work For Residential & Commercial New Construction• Begin 2019 Commercial Land Reappraisal• Begin Cost, Sale & Income Data Collection For 2019 Model Calibration• Managers Review Ratio Study Results – Identify Key Areas For 2019 Value Review• Staff Training For 2019 Commercial & Business Personal Property Field Data Collection• Texas Association Of Assessing Officers Annual Conference – Fort Worth• Legal Seminar On Ad Valorem Taxation – San Antonio• Information Systems Rollover Of TAD Data Records To Begin Appraisal Year 2019
September	<ul style="list-style-type: none">• Sept. 1st – Statutory Appraisal Date For Certain Inventory Properties (Sec. 23.12)• Begin 2019 Commercial and BPP Field Reappraisal• Sept. 15th – Statutory Deadline For TAD Board Of Directors To Approve 2019 Budget And 2019-2020 Reappraisal Plan• Begin Residential 2019 Land Value Review• Complete 2019 Commercial Land Reappraisal
October	<ul style="list-style-type: none">• Tax Office Mails 2018 Tax Bills – Appraisal Support For Phone & Customer Service• Begin 2019 Commercial Market Analysis and Model Building• Residential Begins Review of Neighborhood Delineations
November	<ul style="list-style-type: none">• TAD Managers & Supervisors Perform 2018 Employee Performance Reviews• Complete 2019 Commercial Field Reappraisal – Managers Review QC Edits• Continue 2019 Permit Field Work and Model Building• Review and return PTD Clerical Error Report For 2019 Property Value Study
December	<ul style="list-style-type: none">• 2019 Business Personal Property Data Analysis and Model Calibration• Mail Business Personal Property Rendition Forms• Manager review of 2019 Appraisal ratios for Land and Improvement Properties• Receive Final report for 2018-PTAD MAP Review• Complete 2019 Commercial market Analysis and Model Building• Begin 2019 Commercial Valuation Edit Process
January 2019	<ul style="list-style-type: none">• Jan. 1st – Statutory Appraisal Date For Most Categories Of Taxable Property• Residential Statistical Analysis Begins• Complete 2019 Commercial Permit Field Report• Analysis & Preparation For Final Value Edits - Personal Property• Receive 2019 Property Value Results from PTD
February	

Tarrant Appraisal District
2019-2020 Reappraisal Plan

- Begin Application of Residential Neighborhood Market Adjustments
- Business Personal Property Wrap-up Of 2019 Field Verification Activities
- Begin Working 2019 Business Personal Property Renditions
- Texas Association Of Appraisal Districts Conference – Austin

March

- Finalize Residential Changes Prior To 1st Value Notice Run
- Deadline to Submit 2019 Value Study Appeals Evidence
- Appraisal Manager Review of 2019 Ratios for Land and Improved Properties
- Complete 2019 Commercial Valuation Edits and Manager QC

April

- First Mailing of 2019 Residential Homestead Notices
- First Mailing of 2019 Commercial Value Notices
- BPP Rendition Deadline on April 1st
- Finalize Commercial & BPP Changes Prior To First Value Notice Run
- Deadline To File Abatement & Exemption Applications on April 30th
- Begin Hearing Informal Appeals
- Chief Appraiser Submits Completed 2019 Appraisal records To ARB
- 2019 Appraisal Review Board Hearings Begin
- Begin Preparation For 2020 Budget

May

- Continue Mailing Of 2019 Real & BPP Value Notices
- Continue Hearing Informal Appeals
- BPP Rendition Extension Deadline On May 1st
- Statutory Deadline To File Appraisal Review Board Protest

June

- Continued Mailing Of 2019 Real & BPP Value Notices
- Continue Hearing Informal Appeals
- 2019 Appraisal Review Board Hearings Continue
- Mineral Property First Notice Run

July

- Appraisal Review Board Approves 2019 Appraisal Records To Create Appraisal Roll
- Chief Appraiser Certifies 2019 Appraisal Roll To Taxing Units
- Chief Appraiser Prepares 2019 Mass Appraisal Report

2020 REAPPRAISAL – RELATED ACTIVITY OR EVENT

August

- Begin 2020 Appraisal Field Work For Residential & Commercial New Construction
- Begin Cost, Sale & Income Data Collection For 2020 Model Calibration
- Begin 2020 Commercial Land Reappraisal
- Managers Review Ratio Study Results – Identify Key Areas For 2020 Value Review
- Staff Training For 2020 Commercial & Business Personal Property Field Data Collection
- Texas Association Of Assessing Officers Annual Conference – San Antonio
- Legal Seminar On Ad Valorem Taxation – San Antonio
- Information Systems Rollover Of TAD Data Records To Begin Appraisal Year 2020

September

- Sept. 1st – Statutory Appraisal Date For Certain Inventory Properties (Sec. 23.12)
- Begin 2020 Commercial and BPP Field Reappraisal
- Sept. 15th – Statutory Deadline For TAD Board Of Directors To Approve 2020 Budget
- Begin Residential 2020 Land Value Review
- Complete 2020 Commercial Land Reappraisal

October

- Tax Office Mails 2019 Tax Bills – Appraisal Support For Phone & Customer Service
- Begin 2020 Commercial Market Analysis and Model Building
- Residential Begins Review of Neighborhood Delineations

November

- TAD Managers & Supervisors Perform 2019 Employee Performance Reviews
- Complete 2020 Commercial Field Reappraisal – Managers Review QC Edits

December

- 2020 Business Personal Property Data Analysis and Model Calibration
- Mail Business Personal Property Rendition Forms
- Complete 2020 Commercial Market Analysis and Model Building
- Begin 2020 Commercial Valuation Edits

January 2020

- Jan. 1st – Statutory Appraisal Date For Most Categories Of Taxable Property
- Residential Market & Statistical Analysis Begins
- Complete 2020 Commercial Permit Field Work
- Appraisal Departments Prep for 2020 PTAD MAP Review
- Analysis & Preparation For Final Value Edits - Personal Property

February

- Begin Application of Residential Neighborhood Market Adjustments
- Business Personal Property Wrap-up Of 2020 Field Verification Activities
- Begin Working 2020 Business Personal Property Renditions
- Texas Association Of Appraisal Districts Conference – Dallas
- Begin On-Site 2020 PTAD MAP Review

March

- Finalize Residential Changes Prior To 1st Value Notice Run
- Deadline to Submit 2019 Value Study Appeals Evidence
- Complete 2020 Commercial Valuation Edits and Manager QC

April

- First Mailing of 2020 Residential Homestead Notices
- First Mailing of 2020 Commercial Value Notices
- BPP Rendition Deadline on April 1st
- Finalize BPP Changes Prior To First Value Notice Run
- Deadline To File Abatement & Exemption Applications on April 30th
- Begin 2020 Hearing Informal Appeals
- Begin Preparation For 2021 Budget and 2021-2022 Reappraisal Plan
- Chief Appraiser Submits Completed 2020 Appraisal records to ARB
- Appraisal review Board Hearings Begin

May

- Continue Mailing Of 2020 Real & BPP Value Notices
- Mineral Property First Notice Run

Tarrant Appraisal District
2019-2020 Reappraisal Plan

- Continue Hearing Informal Appeals
- BPP Rendition Extension Deadline On May 1st
- Statutory Deadline To File Appraisal Review Board Protest

June

- Continued Mailing Of 2020 Real & BPP Value Notices
- Continue Hearing Informal Appeals
- 2020 Appraisal Review Board Hearings Continue

July

- Appraisal Review Board Approves 2020 Appraisal Records To Create Appraisal Roll
- Chief Appraiser Certifies 2020 Appraisal Roll To Taxing Units
- Chief Appraiser Prepares 2020 Mass Appraisal Report

Appendix B. Key Appraisal Personnel in Reappraisal Plan Implementation

<u>DEPARTMENT</u>	<u>EMPLOYEE</u>	<u>POSITION</u>
	JEFFERY D. LAW	EXECUTIVE DIRECTOR/CHIEF APPRAISER
ADMINISTRATION	JEFF CRAIG VICKIE WILKIE	DIRECTOR OF ADMINISTRATION MANAGER OF ARB OPERATIONS
RESIDENTIAL	RANDY ARMSTRONG BRANDON CANARD TROY HANSON ERIC WATKINS MELE LANGLOIS VICTOR GUADALUPE	DIRECTOR OF RESIDENTIAL APPRAISAL DIVISION MANAGER -RESEARCH DIVISION MANAGER-OPERATIONS AND SUPPORT DIVISION MANAGER-DATA COLLECTION DATA QUALITY SUPERVISOR DATA COLLECTION SUPERVISOR
COMMERCIAL	DAVID LAW WILLIE BRAND DEBBIE CABELLO WILLIAM DURHAM ROY SMITH TERRY SPRADLIN	DIRECTOR OF COMMERCIAL APPRAISAL COMMERCIAL/COMPLEX PROPERTIES MANAGER RESEARCH AND REPORTING MANAGER LITIGATION MANAGER REGIONAL MANAGER REGIONAL MANAGER
BPP, MINERALS, UTILITIES	BRAD PATRICK MATT TRACY GARY ANDERSON	DIRECTOR OF BPP, UTILITIES AND MINERALS APPRAISAL MANAGER RESEARCH MANAGER
SUPPORT SERVICES	DONNA PERLICK PRECIOUS BOWERS DAMIANA REYES	DIRECTOR OF SUPPORT SERVICES MANAGER OF SUPPORT SERVICES CUSTOMER SERVICE SUPERVISOR
INFORMATION SERVICES	DJ WHITEHEAD GREG DEAN STEVE OAKES DON MORRIS ROBERT PAYNE	DIRECTOR OF INFORMATION SERVICES INFRASTRUCTURE & OPERATIONS MANAGER BUSINESS ANALYSIS & PROGRAMMING MANAGER WEB SOLUTIONS MANAGER TECHNICAL SUPPORT MANAGER

Appendix C. Residential Market Areas/Neighborhoods

1A010A	1A115B	1B200P	1C200E	1F100E	1H040Q	1L030G	1L060M	1L080M
1A010B	1A115C	1B200Q	1C200F	1F100F	1H050A	1L030H	1L060N	1L1002
1A010C	1A115D	1B200R	1C200G	1F100G	1H050B	1L030I	1L060P	1L100A
1A010D	1A115E	1B200S	1C200H	1F100H	1H050C	1L030J	1L060Q	1L100B
1A010E	1A115F	1B200T	1C210A	1F100I	1H050D	1L030K	1L060R	1L100C
1A010F	1A115G	1B200U	1C210B	1F100J	1H050E	1L030L	1L060S	1L100D
1A010G	1A115H	1B200V	1C210E	1F100K	1H050F	1L030M	1L060T	1L100E
1A010H	1A115I	1C010A	1C210F	1F100L	1H050G	1L030N	1L060U	1L100F
1A010I	1A115J	1C010B	1C210G	1F200A	1H060A	1L030P	1L060V	1L100G
1A010J	1A115K	1C010C	1C210H	1F200B	1H070A	1L030Q	1L060W	1L100H
1A010K	1A115L	1C010D	1C210I	1F200C	1H080B	1L030R	1L060X	1L100I
1A010L	1B010A	1C010E	1C210J	1F200D	1H080C	1L040A	1L060Y	1L100J
1A010M	1B010B	1C010H	1C210L	1F200E	1H080D	1L040B	1L060Z	1L100K
1A010N	1B020A	1C010I	1C220A	1F200F	1H080E	1L040C	1L070A	1L100L
1A010O	1B030A	1C030A	1C220B	1F200G	1H080F	1L040D	1L070B	1L100M
1A010P	1B030B	1C030B	1C220C	1F200H	1H080G	1L040E	1L070C	1L100N
1A010Q	1B030C	1C030C	1C220D	1F200I	1H080H	1L040F	1L070D	1L100P
1A010R	1B030D	1C030D	1C220E	1F200J	1H080I	1L040G	1L070E	1L100Q
1A010S	1B030E	1C030E	1C220F	1H010A	1H080J	1L040H	1L070F	1L100R
1A010T	1B040A	1C030F	1C220G	1H010B	1H080K	1L040I	1L070G	1L100S
1A010U	1B040B	1C030G	1C220H	1H020A	1H080L	1L040J	1L070H	1L100T
1A010V	1B050A	1C030H	1C220I	1H020B	1L010A	1L040K	1L070I	1L100U
1A010W	1B050B	1C030I	1C220J	1H020C	1L010B	1L040L	1L070J	1L100V
1A010X	1B060A	1C030J	1C250A	1H020D	1L010C	1L040M	1L070K	1L100W
1A010Y	1B060C	1C030K	1C250B	1H020E	1L010D	1L040N	1L070L	1L100X
1A010Z	1B060D	1C030L	1C250C	1H030B	1L010E	1L040O	1L070M	1L100Y
1A030A	1B070A	1C030M	1C250D	1H030C	1L010F	1L040P	1L070N	1L100Z
1A030B	1B070B	1C030N	1C250E	1H030D	1L010G	1L040Q	1L070P	1L110A
1A030C	1B070C	1C041A	1C250F	1H030F	1L010H	1L050A*	1L070Q	1L110B
1A030D	1B070D	1C041B	1E010A	1H030G	1L010I	1L0601	1L070R	1L110C
1A030F	1B070E	1C041C	1E010B	1H030H	1L010J	1L0602	1L070S	1L110D
1A030G	1B080A	1C041D	1E010C	1H030I	1L010K	1L0603	1L070T	1L110E
1A030H	1B090A	1C041E	1E020A	1H030J	1L010L	1L0604	1L070U	1L110F
1A030I	1B200A	1C041F	1E020B	1H040A	1L010M	1L0605	1L070V	1L110G
1A030J	1B200B	1C041G	1E030A	1H040B	1L010N	1L0606	1L070W	1L110H
1A030K	1B200C	1C041H	1E030B	1H040C	1L020B	1L060A	1L080A	1L110I
1A030L	1B200D	1C041I	1E030C	1H040D	1L020C	1L060B	1L080B	1L120A
1A030M	1B200E	1C041J	1E030D	1H040E	1L020D	1L060C	1L080C	1L120B
1A030N	1B200F	1C050A	1E030E	1H040F	1L020E	1L060D	1L080D	1L120C
1A030P	1B200G	1C050B	1E030F	1H040G	1L020F	1L060E	1L080E	1L120D
1A030Q	1B200H	1C050C	1E030G	1H040H	1L020G	1L060F	1L080F	1L120E

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1A030R	1B200I	1C050D	1E030H	1H040I	1L030A	1L060G	1L080G	1L120F
1A030S	1B200J	1C050E	1E030I	1H040J	1L030B	1L060H	1L080H	1L120G
1A030T	1B200K	1C200A	1F100A	1H040M	1L030C	1L060I	1L080I	1L120H
1A030U	1B200L	1C200B	1F100B	1H040N	1L030D	1L060J	1L080J	1L120I
1A030V	1B200M	1C200C	1F100C	1H040O	1L030E	1L060K	1L080K	1L120J
1A115A	1B200N	1C200D	1F100D	1H040P	1L030F	1L060L	1L080L	1L120K
1L120L	1L140K	1M010P	1M070I	1M500G	1M900H	1S020S	1X020F	1X120F
1L120P	1L140L	1M010Q	1M070K	1M500H	1M900I	1S020T	1X020G	1X120G
1L120Q	1L140M	1M010R	1M070L	1M500I	1M900J	1S020U	1X020H	1X120H
1L120R	1L140N	1M010U	1M070M	1M500J	1M900K	1S020V	1X020I	1X120I
1L120U	1L150A	1M010V	1M070O	1M500K	1M900L	1S020X	1X020J	1X130A
1L120V	1L150B	1M010X	1M080A	1M500L	1S010A	1S030A	1X020K	1X130B
1L120W	1L150C	1M010Y	1M080B	1M500M	1S010B	1S030B	1X020L	1X130C
1L120X	1L150D	1M010Z	1M080C	1M500N	1S010C	1S030C	1X020M	1X130D
1L1301	1L150E	1M020A	1M080D	1M500O	1S010D	1S030D	1X030A	1X130E
1L1302	1L150F	1M020B	1M080E	1M500P	1S010E	1S030E	1X030B	1X130F
1L1303	1L150G	1M020C	1M080F	1M500Q	1S010F	1S030F	1X030C	1X130G
1L1304	1L150H	1M020D	1M080G	1M500R	1S010G	1S030H	1X030D	1X130H
1L130A	1L150I	1M020E	1M080H	1M500S	1S010H	1S030I	1X030E	1X130I
1L130B	1L150J	1M020F	1M080I	1M500T	1S010I	1S040A	1X030F	1X130J
1L130C	1L150K	1M020G	1M080J	1M500U	1S010J	1S040B	1X030G	1X130K
1L130D	1L160A	1M020I	1M080K	1M500V	1S010K	1S040C	1X040A	1X130L
1L130E	1L160B	1M020J	1M080L	1M500W	1S010L	1S040D	1X040B	1X130M
1L130F	1L160C	1M020K	1M080M	1M500X	1S010M	1S040E	1X040C	1X130N
1L130G	1L160D	1M020L	1M080N	1M500Y	1S010N	1S040F	1X040D	1X130P
1L130H	1L160E	1M020M	1M080O	1M500Z	1S010P	1S040G	1X050B	1X130Q
1L130I	1L160F	1M020N	1M080P	1M600A	1S010Q	1S040H	1X050C	1X130R
1L130J	1L160G	1M020P	1M080Q	1M600B	1S010R	1S040I	1X050E	1X200A
1L130K	1L160H	1M050A	1M090B	1M600C	1S010S	1S040J	1X050F	1X200B
1L130L	1L160I	1M050B	1M090C	1M600D	1S010T	1S040K	1X050G	1X200C
1L130M	1L160J	1M050C	1M090D	1M600E	1S010U	1S040L	1X050H	1X200D
1L130N	1L160K	1M050D	1M090E	1M600H	1S010V	1S040M	1X060A	1X200E
1L130P	1L160L	1M050E	1M090G	1M600M	1S010W	1S040N	1X060B	1X200F
1L130Q	1L160M	1M050F	1M090H	1M800A	1S010X	1S040O	1X100A	1X200G
1L130R	1M0101	1M050G	1M090J	1M800B	1S010Y	1S040Q	1X100B	1X200H
1L130S	1M0102	1M050H	1M100A	1M800C	1S010Z	1S040R	1X110A	1X200I
1L130T	1M0104	1M050I	1M100B	1M800D	1S020A	1S040S	1X110B	220-Common Area
1L130U	1M0105	1M050J	1M100C	1M800E	1S020B	1S040T	1X110C	220-MHImpOnly
1L130V	1M0106	1M050K	1M100D	1M800F	1S020C	1S040U	1X110D	2A100A*
1L130W	1M010A	1M050L	1M100E	1M800G	1S020D	1S040V	1X110E	2A100B*
1L130X	1M010B	1M060A	1M200A	1M800H	1S020E	1S040W	1X110F	2A100C*
1L130Y	1M010C	1M060B	1M200B	1M800I	1S020F	1S040X	1X110G	2A200A*
1L130Z	1M010D	1M060C	1M200C	1M800J	1S020G	1S040Y	1X110H	2A200B*
1L140A	1M010E	1M060D	1M200D	1M800K	1S020H	1S040Z	1X110I	2A200C*

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1L140B	1M010F	1M060E	1M200E	1M800L	1S020I	1X010A	1X110J	2A200D*
1L140C	1M010G	1M070A	1M200F	1M800M	1S020J	1X010B	1X110K	2A200E*
1L140D	1M010H	1M070B	1M5001	1M900A	1S020K	1X010C	1X110L	2A300A*
1L140E	1M010I	1M070C	1M5002	1M900B	1S020L	1X010D	1X110M	2C010A
1L140F	1M010J	1M070D	1M500A	1M900C	1S020M	1X020A	1X120A	2C010B
1L140G	1M010K	1M070E	1M500B	1M900D	1S020O	1X020B	1X120B	2C010C
1L140H	1M010L	1M070F	1M500C	1M900E	1S020P	1X020C	1X120C	2C010D
1L140I	1M010M	1M070G	1M500D	1M900F	1S020Q	1X020D	1X120D	2C020A
1L140J	1M010N	1M070H	1M500E	1M900G	1S020R	1X020E	1X120E	2C020B
2C020C	2M200J	2N020D	2N040X	2N300C	2W100C	2Y100E	2Y300C	3B010E
2C020D	2M210A	2N020E	2N040Y	2N300D	2W100E	2Y100F	2Y300D	3B010F
2C020E	2M210B	2N020G	2N040Z	2N300E	2W100H	2Y100G	2Y300E	3B010G
2C020F	2M210C	2N020H	2N1001	2N300F	2W100I	2Y100H	2Y300F	3B010H
2C020G	2M210D	2N020I	2N1002	2N300G	2W100L	2Y100I	2Y300G	3B010I
2C020H	2M210E	2N020J	2N1003	2N300H	2W100N	2Y100J	2Y300H	3B010J
2C020J	2M500A	2N020L	2N1004	2N300I	2W100P	2Y100K	2Y300I	3B010K
2C020K	2M500B	2N020M	2N1006	2N300J	2W100Q	2Y100L	2Y300J	3B010L
2C030C	2M500C	2N020N	2N10066	2N300K	2W100R	2Y100M	2Y300L	3B010M
2C030D	2M500D	2N020O	2N1007	2N300L	2W100S	2Y100N	2Y300M	3B010N
2C030E	2M500E	2N020P	2N1008	2N300M	2W100T	2Y100O	2Z200A	3B010O
2C030F	2M500F	2N020Q	2N1009	2N300O	2W100U	2Y100P	2Z200B	3B010P
2D100A	2M500G	2N030A	2N100A	2N300P	2W100V	2Y100Q	2Z200C	3B010R
2D100B	2M500H	2N030B	2N100AA	2N300Q	2W100W	2Y100R	2Z200D	3B020A
2D100C	2M500H2	2N030C	2N100B	2N300R	2W200A	2Y100S	2Z200F	3B020B
2D100E	2M500I	2N030D	2N100BB	2N300S	2W200B	2Y100T	2Z201A	3B020C
2D100I	2M500J	2N030E	2N100C	2N300T	2W200C	2Y100U	2Z201B	3B020D
2D100K	2M500K	2N030F	2N100CC	2N300U	2W300A	2Y100V	2Z201C	3B020E
2D100L	2M500L	2N030H	2N100D	2N4001	2W300B	2Y100W	2Z201G	3B020F
2D100M	2M500M	2N030I	2N100DD	2N400A	2W300C	2Y100X	2Z201H	3B020G
2D100N	2M500N	2N030J	2N100E	2N400B	2W300D	2Y100Y	2Z201I	3B020H
2D101A	2M500O	2N030K	2N100F	2N400C	2W300E	2Y100Z	2Z201J	3B020I
2L101A*	2N0103	2N030L	2N100G	2N400D	2W300F	2Y200A	2Z201K	3B020J
2L101B	2N0104	2N040A	2N100H	2N400E	2W300G	2Y200B	2Z201L	3B020K
2M100B	2N0105	2N040A1	2N100I	2N400F	2W300H	2Y200C	2Z300A	3B020L
2M100C	2N010A	2N040B	2N100J	2N400H	2W300I	2Y200D	2Z300C	3B020N
2M100D	2N010B	2N040C	2N100K	2N400I	2W300J	2Y200E	2Z300D	3B020O
2M100E	2N010C	2N040D	2N100L	2N400J	2W300K	2Y200F	2Z300E	3B020P
2M100F	2N010D	2N040E	2N100M	2N400K	2W300L	2Y200G	2Z300F	3B020Q
2M100G	2N010F	2N040F	2N100N	2N400L	2W300M	2Y200H	2Z300G	3B020R
2M110A	2N010I	2N040G	2N100NN	2N400M	2W300N	2Y200I	2Z300H	3B020S
2M110B	2N010J	2N040H	2N100O	2N400N	2W300O	2Y200J	2Z300I	3B020T
2M110C	2N010K	2N040I	2N100P	2N400O	2W300P	2Y200K	2Z300J	3B020U
2M110D	2N010L	2N040J	2N100Q	2N400P	2W300Q	2Y200L	2Z300N	3B030A
2M110E	2N010O	2N040K	2N100R	2N400Q	2W300R	2Y200M	2Z300O	3B030B

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2M110F	2N010P	2N040L	2N100S	2N400R	2W300S	2Y200N	2Z500A	3B030C
2M110G	2N010Q	2N040M	2N100T	2N400S	2W300T	2Y200O	2Z500B	3B030D
2M110I	2N010R	2N040N	2N100U	2N400T	2W300U	2Y200P	2Z500C	3B030E
2M200A	2N010S	2N040O	2N100V	2N400U	2W300W	2Y200Q	2Z500D	3B030F
2M200B	2N010T	2N040P	2N100W	2N400V	2Y1002	2Y200R	2Z500E	3B030G
2M200C	2N010U	2N040Q	2N100X	2N400W	2Y1005	2Y200S	2Z500F	3B030H
2M200D	2N010V	2N040R	2N100Y	2N400X	2Y1007	2Y200T	2Z500G	3B030I
2M200E	2N010V2	2N040S	2N100Z	2N400Y	2Y1008	2Y200U	2Z500H	3B030J
2M200F	2N010W	2N040T	2N200A	2N400Z	2Y100A	2Y200V	3B010A	3B030K
2M200G	2N020A	2N040U	2N200F	2V100A	2Y100B	2Y200W	3B010B	3B030L
2M200H	2N020B	2N040V	2N300A	2W100A	2Y100C	2Y300A	3B010C	3B030M
2M200I	2N020C	2N040W	2N300B	2W100B	2Y100D	2Y300B	3B010D	3B030N
3B030O	3C020P	3C040I	3C100R	3C800C	3G030E	3K200E	3K400G	3K700B
3B030P	3C020R	3C040J	3C100S	3C800D	3G030F	3K200F	3K400I	3K700C
3B030Q	3C020S	3C040K	3C100T	3C800E	3G030G	3K200G	3K400J	3K700D
3B040A	3C020V	3C040L	3C100U	3C800F	3G030H	3K200H	3K400K	3K700E
3B040B	3C020W	3C040M	3C100V	3C800G	3G030I	3K200I	3K400L	3K700F
3B040C	3C030A	3C040N	3C100W	3C800H	3G030J	3K200J	3K500A	3K700G
3B040D	3C030B	3C040O	3C100X	3C800I	3G030K*	3K200K	3K500B	3M010A
3B040E	3C030C	3C040P	3C100Y	3C800J	3G030L*	3K200L	3K500D	3M010B
3B040F	3C030D	3C040Q	3C100Z	3C800L	3G040A	3K200M	3K500E	3M010C
3B040H	3C030E	3C040R	3C500A	3C800M	3G040B	3K200N	3K500F	3M010D
3B040I	3C030F	3C040S	3C500B	3C800N	3G040C	3K200O	3K500G	3M010E
3B040J	3C030G	3C040T	3C500D	3C800O	3G040D	3K3001	3K500H	3M010F
3B040K	3C030H	3C050A	3C500E	3C800P	3G100A	3K3002	3K500I	3M010G
3B040L	3C030I	3C050B	3C500G	3C800Q	3G101A	3K3003	3K500J	3M010H
3B040M	3C030J	3C050C	3C500H	3C800S	3G102A	3K3004	3K500K	3M010I
3B040N	3C030K	3C050D	3C500I	3C800T	3G102B	3K300A	3K500L	3M010J
3B040O	3C030L	3C050E	3C500J	3C800U	3G102C	3K300B	3K500N	3M010K
3B040P	3C030M	3C050F	3C500K	3G010B	3G102D	3K300C	3K500O	3M010L
3B040Q	3C030N	3C050G	3C500L	3G010D	3G102E	3K300D	3K6001	3M010M
3B040S	3C030O	3C050H	3C500M	3G010E	3H010A	3K300E	3K6002	3M010N
3B040T	3C030P	3C050I	3C500N	3G010F	3H010B	3K300F	3K600A	3M010O
3B040U	3C031A	3C050J	3C500O	3G010G	3H010C	3K300G	3K600B	3M010P
3C010A	3C031B	3C050K	3C500P	3G010H	3H010D	3K300H	3K600C	3M010Q
3C010B	3C031C	3C050M	3C500Q	3G010I	3H010E	3K300I	3K600D	3M010R
3C010C	3C031D	3C1001	3C500R	3G010J	3H010F	3K300J	3K600E	3M010S
3C010D	3C031E	3C1002	3C600A	3G010K	3H010G	3K300K	3K600F	3M010T
3C010F	3C031H	3C1004	3C600B	3G010L	3H010H	3K300L	3K600G	3M010U
3C010G	3C031I	3C1005	3C600C	3G010M	3H010I	3K300M	3K600H	3M010V
3C010H	3C031J	3C1006	3C600E	3G010N	3H020A	3K300N	3K600I	3M010X
3C010I	3C031K	3C1007	3C600F	3G010O	3H020B	3K300O	3K600J	3M020A
3C010J	3C031L	3C1008	3C600G	3G020A	3H020C	3K300P	3K600K	3M020B
3C010K	3C031M	3C1009	3C600H	3G020B	3H020D	3K300Q	3K600L	3M020C

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3C020A	3C031P	3C100C	3C600I	3G020C	3H020E	3K300R	3K600M	3M020D
3C020B	3C031Q	3C100D	3C600J	3G020D	3H030A	3K300S	3K600N	3M020E
3C020C	3C031R	3C100E	3C600K	3G020E	3H030C	3K300T	3K600O	3M020F
3C020D	3C031S	3C100F	3C600L	3G020F	3H030D	3K300U	3K600P	3M020G
3C020E	3C031T	3C100G	3C700B	3G020G	3K0403	3K300V	3K600Q	3M020H
3C020F	3C031U	3C100H	3C700C	3G020H	3K0400	3K300W	3K600R	3M020I
3C020G	3C031V	3C100I	3C700D	3G020I	3K100A	3K300X	3K600S	3M020J
3C020H	3C031W	3C100J	3C700E	3G020J	3K100B	3K300Y	3K600T	3M020K
3C020I	3C040A	3C100K	3C700F	3G020K	3K100C	3K300Z	3K600U	3M020L
3C020J	3C040B	3C100L	3C700G	3G020M	3K100D	3K400A	3K600V	3M020M
3C020K	3C040C	3C100M	3C700H	3G020N	3K100E	3K400B	3K600W	3M020P
3C020L	3C040D	3C100N	3C700I	3G030A	3K100F	3K400C	3K600X	3M020Q
3C020M	3C040F	3C100O	3C700L	3G030B	3K200A	3K400D	3K600Y	3M020R
3C020N	3C040G	3C100P	3C800A	3G030C	3K200C	3K400E	3K600Z	3M020S
3C020O	3C040H	3C100Q	3C800B	3G030D	3K200D	3K400F	3K700A	3M020T
3M020U	3M040F	3M130H	3M400O	3M600J	3S030A	3S040P	3S500A	3W020I
3M020V	3M040G	3M130I	3M400P	3M600K	3S030B	3S040Q	3S500B	3W020J
3M0301	3M040H	3M130J	3M400Q	3M600M	3S030D	3S040R	3S500C	3W020K
3M0302	3M040I	3M130K	3M5001	3M600N	3S030E	3S040S	3S500D	3W020L
3M0303	3M040J	3M130L	3M5002	3R010A	3S030F	3S040T	3S500E	3W020M
3M0304	3M040K	3M130M	3M5003	3R010B	3S030G	3S040U	3S500F	3W020N
3M0305	3M040L	3M130N	3M5004	3R010C	3S030H	3S040V	3T010A	3W020O
3M0306	3M040M	3M130O	3M5005	3R010D	3S030I	3S040VV	3T010B	3W0301
3M0307	3M040N	3M130P	3M5006	3R010E	3S030J	3S040W	3T010C	3W030A
3M0308	3M040O	3M130Q	3M5007	3R010F	3S030K	3S040X	3T010D	3W030B
3M0309	3M040P	3M200A	3M5008	3R010G	3S030M	3S040Y	3T010E	3W030D
3M030A	3M040Q	3M200B	3M5009	3R010H	3S030N	3S040Z	3T010F	3W030E
3M030AA	3M040R	3M200C	3M500A	3R010I	3S030P	3S100H	3T010G	3W030F
3M030B	3M040S	3M200D	3M500AA	3R010J	3S030Q	3S100I	3T010H	3W030G
3M030BB	3M040T	3M200F	3M500B	3R010K	3S030S	3S100J	3T010I	3W030H
3M030C	3M040U	3M200G	3M500C	3R010L	3S030T	3S100K	3T010J	3W030I
3M030D	3M040V	3M200H	3M500D	3R010M	3S030U	3S100L	3T020B	3W030J
3M030E	3M040Y	3M200I	3M500E	3R010N	3S0401	3S100M	3T020E	3W030K
3M030F	3M040Z	3M200J	3M500F	3R010P	3S0402	3S100N	3T030A	3W030L
3M030G	3M100A	3M200K	3M500G	3R010Q	3S0403	3S100O	3T030B	3W030M
3M030H	3M100B	3M200L	3M500H	3R020A	3S0404	3S200A	3T030C	3W030N
3M030I	3M100C	3M200M	3M500I	3R020B	3S0405	3S200B	3T030D	3W030O
3M030J	3M100D	3M200N	3M500J	3R020C	3S0406	3S200C	3T030E	3W030P
3M030K	3M100E	3M300A	3M500K	3R030A	3S0407	3S200D	3T030F	3W030Q
3M030L	3M100F	3M300B	3M500L	3S010A	3S0408	3S200E	3T030G	3W030R
3M030M	3M110A	3M300C	3M500M	3S010B	3S0409	3S200F	3T030H	3W030S
3M030N	3M110B	3M300D	3M500N	3S010C	3S040A	3S300A	3T030I	3W030T
3M030O	3M110C	3M300E	3M500P	3S010D	3S040AA	3S300B	3T030J	3W030U
3M030P	3M110D	3M300F	3M500Q	3S010E	3S040B	3S300C	3T030K	3W030V

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3M030Q	3M110F	3M300G	3M500R	3S010G	3S040BB	3S300D	3T030L	3W030W
3M030R	3M110G	3M300H	3M500S	3S010H	3S040C	3S300F	3T030M	3W030X
3M030S	3M110H	3M300I	3M500T	3S010S	3S040CC	3S300G	3T030N	3W030Y
3M030T	3M120A	3M300J	3M500U	3S020A	3S040D	3S300H	3T030Q	3W030Z
3M030U	3M120B	3M300K	3M500V	3S020B	3S040DD	3S300I	3T030R	3W040A
3M030V	3M120C	3M400A	3M500W	3S020C	3S040E	3S300J	3T030S	3W040B
3M030W	3M120D	3M400B	3M500X	3S020D	3S040EE	3S300k	3T030T	3W040C
3M030X	3M120E	3M400C	3M500Y	3S020E	3S040F	3S300L	3T030U	3W040D
3M030Y	3M120F	3M400D	3M500Z	3S020F	3S040FF	3S300M	3T030W	3W040E
3M030Z	3M120G	3M400E	3M600A	3S020G	3S040G	3S300N	3T030X	3W040F
3M0401	3M120H	3M400F	3M600B	3S020H	3S040H	3S300O	3T030Y	3W040G
3M0402	3M130A	3M400G	3M600C	3S020I	3S040I	3S400B	3T030Z	3W040I
3M0403	3M130B	3M400H	3M600D	3S020J	3S040J	3S400C	3W020A	3W040J
3M0404	3M130C	3M400J	3M600E	3S020K	3S040K	3S400D	3W020B	3W040K
3M040A	3M130D	3M400K	3M600F	3S020L	3S040L	3S400G	3W020C	3W040L
3M040B	3M130E	3M400L	3M600G	3S020M	3S040M	3S400H	3W020D	3W040M
3M040C	3M130F	3M400M	3M600H	3S020N	3S040N	3S400I	3W020E	3W040N
3M040D	3M130G	3M400N	3M600I	3S020O	3S040O	3S400P	3W020H	3W040O
3W040P	3X020S	3X100I	4B010A	4B030M	4M002B	4R003I	4S120E	4S410D
3W040Q	3X020T	3X100J	4B010B	4B030N	4M002C	4R003J	4S120I	4S410F
3W040T	3X020U	3X100K	4B010C	4B030O	4M002D	4R003K	4S120P	4S410H
3W040U	3X020V	3X100L	4B010D	4B030P	4M002E	4R004A	4S120R	4S411A
3W040W	3X020W	3X100M	4B010E	4B030Q	4M002F	4R004B	4S120S	4S411B
3W050A	3X020X	3X100N	4B010F	4B030R	4M002G	4R004C	4S120T	4S411C
3W050B	3X020Y	3X100O	4B010G	4B030S	4M002H	4R004D	4S121A	4T001A*
3W050C	3X020Z	3X100P	4B010H	4B030T	4M002I	4R004E	4S121B	4T001B*
3W050M	3X030A	3X100Q	4B010I	4C010A*	4M003A	4R010A	4S121C	4T001C*
3W050P	3X030D	3X100R	4B010J	4C020A*	4M003B	4R010B	4S130A	4T001D*
3W100A	3X030E	3X100S	4B010K	4C100A*	4M010A	4R010C	4S130B	4T001E*
3W200A	3X030F	3X100T	4B010L	4C100B*	4M010B	4R010D	4S130C	4T001G
3X010A	3X030G	3X100U	4B011A	4C100C*	4M010C	4R020A	4S130D	4T001H*
3X010B	3X030I	3X100V	4B011B	4C110A*	4M011A	4R020B	4S130F	4T001I*
3X010C	3X030K	3X100Y	4B011C	4C110B	4M011B	4R020C	4S240A	4T001J*
3X010D	3X030M	3X100Z	4B011E	4C120A*	4M020A	4R020D	4S240B	4T001K*
3X010E	3X030N	3X110A	4B011G	4C120B*	4M020B	4R020E	4S240C	4T001L*
3X010F	3X030P	3X110B	4B011H	4C120C*	4M020C	4S001A	4S240D	4T001M
3X010G	3X030Q	3X110C	4B012A	4C120D*	4M020D	4S001B	4S240E	4T001N
3X010H	3X030R	3X110D	4B012B	4C121A*	4M020E	4S001C	4S240F	4T001O
3X010I	3X030S	3X110E	4B012C	4C121B*	4M020F	4S001D	4S240G	4T001P
3X010J	3X030T	3X110F	4B012D	4C121C*	4M020G	4S002A	4S240H	4T001R
3X010K	3X030U	3X110G	4B012E	4C122A*	4M020H	4S002B	4S240I	4T001S
3X010L	3X030V	3X110H	4B012F	4C122B*	4M020I	4S002C	4S350A	4T001T
3X010M	3X030W	3X110I	4B012G	4C122C*	4M020L	4S002D	4S350B	4T001U
3X010N	3X030X	3X110J	4B012H	4C130A	4M020M	4S004A	4S350C	4T002A*

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3X010O	3X030Z	3X110L	4B012I	4C130B	4M020N	4S004B	4S350D	4T002C
3X010P	3X040A	3X110M	4B020A	4C130C	4M020O	4S004C	4S350E	4T002D
3X0201	3X040B	3X110Q	4B020B	4C130D	4M020P	4S004D	4S350F	4T002E
3X020A	3X040C	3X110R	4B020C	4C130F	4M020Q	4S004E	4S350G	4T002F
3X020B	3X040D	3X110T	4B020D	4C210A*	4M020R	4S004F	4S360A	4T002G
3X020C	3X040E	4A100A	4B020E	4C210B*	4R002A	4S004G	4S360B	4T002H
3X020D	3X040F	4A100C	4B020F	4C210C*	4R002B	4S004H	4S360C	4T002I
3X020E	3X040G	4A100D	4B020G	4C210D*	4R002C	4S004I	4S360D	4T010A*
3X020F	3X040H	4A100L	4B020H	4C211A*	4R002D	4S004J	4S360E	4T010B*
3X020G	3X040I	4A100M	4B020I	4C211B*	4R002E	4S004K	4S360G	4T010C*
3X020H	3X040J	4A100N	4B020J	4D001A	4R002F	4S004L	4S360H	4T010D*
3X020I	3X040K	4A100O	4B020K	4D001B	4R002G	4S004M	4S360I	4T010E*
3X020J	3X1001	4A100P	4B020L	4D004A	4R002H	4S004N	4S360J	4T020A*
3X020K	3X100A	4A100Q	4B020M	4D004B	4R003A	4S004O	4S360K	4T020B*
3X020L	3X100B	4A100R	4B020O	4D004C	4R003B	4S004P	4S360L	4T020D*
3X020M	3X100C	4A100S	4B030A	4D004D	4R003C	4S004Q	4S360M	4T020E*
3X020N	3X100D	4A100T	4B030H	4D004E	4R003D	4S004R	4S360N	4T020G*
3X020O	3X100E	4A200A	4B030I	4D004F	4R003E	4S004S	4S360P	4T020H*
3X020P	3X100F	4A200B	4B030J	4D004G	4R003F	4S004U	4S360Q	4T021A*
3X020Q	3X100G	4A200C	4B030K	4M001A	4R003G	4S120B	4S410B	4T021B*
3X020R	3X100H	4A200J	4B030L	4M002A	4R003H	4S120D	4S410C	4T021C*
4T021D*	4W003L	C2E01A	C4T01D	M1A04M	M1A06K	M1F01E	M2N01W	M3G01W
4T021E*	4W003M	C2E01B	C4T01F	M1A04W	M1A06L	M1F01F	M2N01X	M3G01X
4T021F	4W003N	C3C01A	C4T01G	M1A05A	M1A06M	M1F01G	M2N01Y	M3H01N
4T025A	4W003O	C3C01C	C4T01H	M1A05A1	M1A06N	M1F01H	M2N01Z	M3H01R
4T025B	4W003P	C3C01D	C4T01J	M1A05B	M1A06O	M1F01O	M2S01B	M3H01S
4T025C	4W003Q	C3C01E	M1A01L	M1A05B1	M1A06P	M1F01P	M2S01C	M3K01A
4T050A*	4W004A	C3C01F	M1A01M	M1A05C	M1A06P1	M1F01Q	M2S01D	M3K01A1
4T050B*	4W004B	C3C01G	M1A01O	M1A05C1	M1A06Q	M1F01S	M2S01E	M3K01B
4T050C*	4W004C	C3C01T	M1A01P	M1A05D	M1A06R	M1F01T	M2S01L	M3K01B1
4T050J	4W004D	C3C01V	M1A01S	M1A05E	M1A06S	M1F01W	M2S01M	M3K01C
4T930A	4W005A	C3C01W	M1A01W	M1A05F	M1A06T1	M1F01Z	M2S01N	M3K01C1
4T930B	4W005B	C3C01X	M1A02A	M1A05G	M1A06T2	M1F02E	M2S01P	M3K01D
4T930C	C1A01A	C3C02A	M1A02B	M1A05G1	M1A06U	M1F03A	M2S01S	M3K01D1
4T930D	C1A01B	C3H01A	M1A02C	M1A05H	M1A06V	M1F03F	M2S01Z	M3K01E
4T930E	C1A01C	C3H01B	M1A02D	M1A05H1	M1A06W	M1F03H	M2S02L	M3K01E1
4T930F	C1A01D	C3H01C	M1A02E	M1A05I	M1A06X	M1F03Z	M2S03C	M3K01F
4T930G	C1A01E	C3H01D	M1A02F	M1A05J	M1A06Y	M1M01A	M2S03J	M3K01G
4T930H	C1A01F	C3H01E	M1A02G	M1A05K	M1A06Z	M1M01C	M2S03L	M3K01H
4T930I	C1A01G	C3H01F	M1A02H	M1A05K1	M1B01C	M1M01K	M2S03M	M3K01H1
4T930J	C1F01B	C3H01G	M1A02I	M1A05L	M1B01E	M1M01O	M2S03Z	M3K01I
4T930K	C1F01C	C4C01A	M1A02J	M1A05L1	M1B01F	M1M01P	M2W01A	M3K01J
4T930L	C1F01D	C4C01B	M1A02K	M1A05M	M1B01H	M1M01S	M2W01C	M3K01K
4T930M	C1F01E	C4C01C	M1A02L	M1A05M1	M1B01L	M1M01W	M2W01D	M3K01L

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4T930N	C1F01F	C4C01D	M1A02M	M1A05N	M1B01O	M2N01S	M3M02B	M4B10C
4T930O	C1N01A	C4C01E	M1A02N	M1A05O	M1B01S	M2N01T	M3M02B1	M4B10D
4T930P	C1N01B	C4C01F	M1A02O	M1A05P	M1B01W	M2N01U	M3M02C	M4B10H
4T930Q	C1N01C	C4C01G	M1A02P	M1A05Q	M1B02B	M2N01V	M3M02D	M4B10L
4T930X	C1N01D	C4C01H	M1A02Q	M1A05R	M1B02C	M2W01E	M3M02D1	M4B10M
4T930Y	C1N01E	C4C01J	M1A02R	M1A05S	M1B02E	M2W01F	M3M02E	M4B10P
4T930Z	C1N01F	C4C01K	M1A02T	M1A05S1	M1B02M	M2W01G	M3M02E1	M4B10Q
4W001A	C1N01G	C4C01L	M1A02U	M1A05T	M1B02O	M2W01H	M3M02F	M4B10R
4W001B	C1N01H	C4C01N	M1A02V	M1A05U	M1B02P	M2W01I	M3K01M	M4C02A
4W001C	C1N01I	C4C01O	M1A02W	M1A05V	M1B02S	M2W01L	M3K01N	M4D07E
4W001D	C1N01J	C4C01P	M1A02X	M1A05W	M1B02T	M2W01M	M3K01O	M4D07W
4W002A	C1N01K	C4R01A	M1A02Y	M1A05X	M1B02W	M2W01P	M3K01P	M4I08E
4W002B	C1N01L	C4R01B	M1A02Z	M1A05Z	M1B03K	M2W01S	M3K01Q	M4I08W
4W003A	C1N01M	C4R01C	M1A03A	M1A06A	M1B03O	M2W01V	M3K01R	M4R04A
4W003B	C1N01P	C4R01D	M1A03D	M1A06B	M1B03P	M2W01W	M3K01S	M4R04B
4W003C	C1N01Q	C4R01E	M1A03E	M1A06C	M1B03S	M2W01Z	M3K01T	M4S05R
4W003D	C1S01A	C4R01F	M1A03H	M1A06D	M1B04B	M3G01A	M3K01U	M4S05S
4W003E	C1S01B	C4R01G	M1A03P	M1A06E	M1B04M	M3G01B	M3K01V	M4S05T
4W003F	C1S01D	C4R01H	M1A03Q	M1A06E1	M1B04W	M3G01C	M3K01W	M4S05W
4W003G	C1S01E	C4R01J	M1A03R	M1A06G	M1B04Z	M3G01E	M3K01X	M4S05X
4W003H	C1S01F	C4R01K	M1A03S	M1A06G1	M1F01A	M3G01F	M3K01Y	M4S06Q
4W003I	C1S01G	C4R01L	M1A03W	M1A06H	M1F01B	M3G01G	M3K01Z	M4T03A
4W003J	C2A01A	C4T01A	M1A04B	M1A06I	M1F01C	M3G01H	M3M02A	M4T03O
4W003K	C2A01B	C4T01B	M1A04G	M1A06J	M1F01D	M3G01K	M3M02A1	M4W06A
M3M02F1	M4R04C	T1A02C	T3G01G	T4R01D	M1M01Z	M3G01M	M3M02B	M4W06B
M3M02G	M4R04E	T1A02D	T3G01H	T4R01E	M2N01B	M3G01P	M3M02B1	M4W06C
M3M02H	M4R04G	T1A02E	T3G01J	T4R01F	M2N01B1	M3G01R	M3M02C	M4W06H
M3M02I	M4R04H	T1A02F	T3H01A	T4R01G	M2N01C	M3G01T	M3M02D	M4W06M
M3M02J	M4R04L	T1A02G	T3H01B	T4R01H	M2N01D	M3K01M	M3M02D1	M4W06W
M3M02K	M4R04P	T1A02H	T3H01C	T4R01J	M2N01D1	M3K01N	M3M02E	T1A01A
M3M02L	M4R04R	T1A02J	T3H01D	T4S01A	M2N01E1	M3K01O	M3M02E1	T1A01B
M3M02M	M4R04T	T1A02K	T3H01E	T4S01B	M2N01F	M3K01P	M3M02F	T1A01C
M3M02N	M4R04W	T1A03A	T3H01F	T4T01A	M2N01G	M3K01Q	M3M02W	T1A01D
M3M02O	M4S05A	T1A03B	T3H01G	T4T01B	M2N01H	M3K01R	M3M02W1	T1A01E
M3M02P	M4S05B	T1A03C	T3H01H	T4T01G	M2N01I	M3K01S	M3M02X	T1A01F
M3M02Q	M4S05C	T1A03E	T3H01I	T4T01H	M2N01J	M3K01T	M3M02Y	T1A01G
M3M02R	M4S05D	T1A03K	T3H01J	T4T01J	M2N01K	M3K01U	M3M02Z	T1A01H
M3M02S	M4S05E	T1A03L	T3H01K	T4W01A	M2N01L	M3K01V	M3M03B	T1A01K
M3M02S1	M4S05F	T1A03N	T3H01L	T4W01B	M2N01M	M3K01W	M3M03C	T1A01M
M3M02T1	M4S05G	T1A03S	T3H01M	T4W01C	M2N01N	M3K01X	M3M03D	T1A01N
M3M02U	M4S05H	T1F01A	T3H01N	U4001A	M2N01O	M3K01Y	M3M03N	T1A02A
M3M02U1	M4S05K	T1F02A	T3H01P	U4001B	M2N01P	M3K01Z	M3M03Q	T1A02B
M3M02V	M4S05M	T1F02B	T3H01Q	U4001C	M2N01Q	M3M02A	M3M03T	T1F02D
M3M02V1	M4S05P	T1F02C	T3H01R	U4001D	M2N01R	M3M02A1	M4B10B	T1F02E

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T1F02F	T2L01B	T3C01G	T3G01F	T4C02G	T4C05E	T4D01C	U4001K	U4002F
T1F02G	T2L01C	T3C01H	T3H01S	T4C03A	T4C05F	T4R01A	U4001L	U4003A
T2F01B	T3C01A	T3F02A	T3H01T	T4C03B	T4C05G	T4R01B	U4001N	
T2F01C	T3C01B	T3G01A	T4C01A	T4C04A	T4C06A	T4R01C	U4002A	
T2F01D	T3C01C	T3G01B	T4C01C	T4C04B	T4C06B	U4001E	U4002B	
T2F01E	T3C01D	T3G01C	T4C02A	T4C05A	T4C06C	U4001F	U4002C	
T2K01A	T3C01E	T3G01D	T4C02B	T4C05B	T4D01A	U4001H	U4002D	
T2L01A	T3C01F	T3G01E	T4C02D	T4C05C	T4D01B	U4001J	U4002E	

Appendix D. Commercial Improved Market Areas

APARTMENT SECTORS

Apartment Sector 1 – NORTHWEST TARRANT COUNTY

Mapsco Numbers: 1A-Z, 2A-Z, 3A-Z, 4A-Z, 5A-Z, 6ABEFJKNPSTWX, 15A-Z, 16A-Z, 17A-Z, 18A-Z, 19A-Z, 20ABEFJKNPSTWX, 29A-Z, 30A-Z, 31A-Z, 32A-Z, 33A-Z, 34A-Z, 44BCDGHM, 45ABCDEFHJKLMPQRTUVWXYZ, 46A-Z, 47ABCDEFHJKLMNW, 48ABCEF, 58DHM, 59ABCDEFHJKLMPQRTUVWXYZ, 60A-Z, 61ABEFJKNPST, Parker County, Wise County

Apartment Sector 2 – NORTHEAST TARRANT COUNTY

Mapsco Numbers: 6CDGHLMQRUVYZ, 7A-Z, 8A-Z, 9A-Z, 10A-Z, 11A-Z, 12A-Z, 13A-Z, 14A-Z, 20CDGHLMQRUVYZ, 21A-Z, 22A-Z, 23A-Z, 24A-Z, 25A-Z, 26A-Z, 27A-Z, 28A-Z, 35ABCDEFHJKLMNPQR, 36ABCDEFHJKLMNPQR, 37ABCDEFH, 39ABCDEFHJKLMQRUV, 40ABCDEFHJKLMNPQRSTU, 41ABCDEFHJKLM, Denton County

Apartment Sector 3 – HEB

Mapsco Numbers: 39JNPSTWXYZ, 40WXYZ, 41NPQRSTUWXYZ, 42A-Z (DFW AIRPORT), 52HMRUVXYZ, 53A-Z, 54ABCDEFHJKLMNPQRSTU, 55ABCDEFHJKLMNPQR, 56ABCDEFH

Apartment Sector 4 – CENTREPORT

Mapsco Numbers: 54WXYZ, 55STUWXYZ, 56JKLMNPQRSTUWXYZ

Apartment Sector 5 – NORTH ARLINGTON

Mapsco Numbers: 68A-Z, 69A-Z, 70A-Z, 81D, 82ABCD, 83ABCD, 84ABCD

Apartment Sector 6 – CENTRAL ARLINGTON

Mapsco Numbers: 81GHJKLMNPQRUVZ, 82EFGHJKLMNPQRSTUWXYZ, 83EFGHJKLMNPQRSTUWXYZ, 84EFGHJKLMNPQRSTUWXYZ

Apartment Sector 7 – SOUTH ARLINGTON/MANSFIELD/KENNEDALE

Mapsco Numbers: 80NPQRSTUWXYZ, 81STWXY, 93HMRUVYZ, 94A-Z, 95A-Z, 96A-Z, 97A-Z, 98A-Z, 107CDGHLM, 108ABCDEFHJKLMNPQRVZ, 109A-Z, 110A-Z, 111A-Z, 112A-Z, 123A-Z, 124A-Z, 125A-Z, 126A-Z, Ellis County, Johnson County

Apartment Sector 8 – SOUTH TARRANT COUNTY

Mapsco Numbers: 76UVYZ, 77EJNSW, 90CDGHLMQRUVYZ,
91A-Z, 92A-Z, 93CDEFGJKLNQSTWX, 104CDGHLMQRUVYZ, 105A-Z, 106A-Z,
107ABEFJKNPQRSTUUVWXYZ, 108STUWXY, 118A-Z, 119A-Z, 120A-Z, 121A-Z, 122A-Z

Apartment Sector 9 – SOUTHWEST FORT WORTH (BRYANT IRVIN/HULEN)

Mapsco Numbers: 74XYZ, 75UVWXYZ, 76STWX, 88A-Z, 89ABCDEFGHJKLNPS, 90A,
102ABC

Apartment Sector 10 – SOUTHWEST TARRANT COUNTY/BENBROOK

Mapsco Numbers: 73QRSTUVWXYZ, 86PQRTUVXYZ, 87BCDFGHJKLMNPQRSTUVWXYZ,
89MQRTUVWXYZ, 90BEFJKNPSTWX, 99MPQRSTUVWXYZ,
100BCDFGHJKLMNPQRSTUVWXYZ, 101A-Z, 102DEFGHJKLMNPQRSTUVWXYZ, 103A-Z,
104ABEFJKNPSTWX, 113A-Z, 114A-Z, 115A-Z, 116A-Z, 117A-Z

Apartment Sector 11 – WESTERN HILLS

Mapsco Numbers: 43A-Z, 44AEFJKLMNPQRSTUVWXYZ, 45NS, 57A-Z,
58ABCEFGJKLMNPQRSTUVWXYZ, 59NSW, 71A-Z, 72A-Z, 73ABCDEFGHJKLMNP, 85A-Z,
86ABCDEFGHJKLMNSW, 87AE, 99ABCDEFGHJKLN, 100A

Apartment Sector 12 – RIDGLEA/RIDGMAR/ARLINGTON HEIGHTS

Mapsco Numbers: 74ABCDEFGHJKLMNPQRSTUVW, 75ABCDEFGHJKLMNPQRST

Apartment Sector 13 – NORTH FORT WORTH

Mapsco Numbers: 47PQRSTUVWXYZ, 48DGHJKLMNPQRSTUVWXYZ,
49JKLMNPQRSTUVWXYZ, 50JNSW, 61CDGHLMQRUVWXYZ,
62ABCDEFGHJKLMNPQRSTU, 63ABCDEFGHJKLMNPQRSTUVWXYZ, 64NPQRSTUVWXYZ,
77BCD

Apartment Sector 14 – FOSSIL CREEK

Mapsco Numbers: 35STUWXYZ, 36STUWXYZ, 49ABCDEFGH, 50ABCDEFGH

Apartment Sector 15 – HALTOM CITY/RICHLAND HILLS

Mapsco Numbers: 37JKLMNPQRSTUVWXYZ, 38A-Z, 50KLMPQRTUVXYZ, 51A-Z,
52ABCDEFGJKLNQSTW, 64ABCDEFGHJKLM, 65ABCDEFGH, 66A

Apartment Sector 16 – WOODHAVEN

Mapsco Numbers: 65JKLMNPQRSTUVWXYZ, 66BCDEFGHJKLMNPQRSTUVWXYZ,
79ABCD, 80ABCEFGJKLM

Apartment Sector 17 – EASTCHASE

Mapsco Numbers: 67A-Z, 80DH, 81ABCEF

Apartment Sector 18 – STOP 6

Mapsco Numbers: 77FGHKLMPQRTUVXYZ, 78A-Z, 79EFGHJKLMNPQRSTUVWXYZ, 93AB

Apartment Sector 19 – DOWNTOWN/CULTURAL DISTRICT

Mapsco Numbers: 62WXYZ, 63W, 76ABCDEFGHJKLMNPQR, 77A

INDUSTRIAL BUILDING SECTORS

Industrial Sector 1 - DOWNTOWN / 7TH STREET / TRINITY RIVER

Mapsco Numbers: 62GLMQRTUVWXTZ, 63JNSW, 76ABCD, 77A

Industrial Sector 2 - NORTH FORT WORTH

Mapsco Numbers: 20KPTUVXYZ, 21NPQRSTUVWXYZ, 22NPQRSTUVWXYZ,
33BCDGHLMQRUVYZ, 34BCDFGHJKLMNPQRSTUVWXYZ,
35ABCDEFGHJKLMNPQRSTUVWXYZ,
36ABCDEFGHJKLMNPQRSTUVWXYZ, 37JKLMNPQRSTUVWXYZ,
38BCDEFGHJKLMNPQRSTUVWXYZ, 39JNSTWX, 47CDGHLM,
48ABCDEFGHJKLMNPQRSTUVWXYZ,
49ABCDEFGHJKLMNPQRSTUVWXYZ, 50 ABCDEFGHJKLMNPQRSTUVWXYZ,
51ABCDEFGHJKLMNPQRSTUVWXYZ, 52ABCDEFGJKNPSW, 63BCD, 64ABCD

Industrial Sector 3 - NORTHWEST TARRANT COUNTY

Mapsco Numbers: 1 ABCDEFGHJKLMNPQRSTUVWXYZ, 2
ABCDEFGHIJKLMNPQRSTUVWXYZ,
3ABCDEFGHIJKLMNPQRSTUVWXYZ, 4 ABCDEFGHJKLMNPQRSTUVWXYZ,
5ABCDEFGHIJKLMNPQRSTUVWXYZ, 6AEJNSW, 15 ABCDEFGHJKLMNPQRSTUVWXYZ,
16ABCDEFGHIJKLMNPQRSTUVWXYZ, 17ABCDEFGHIJKLMNPQRSTUVWXYZ,
18ABCDEFGHIJKLMNPQRSTUVWXYZ, 19ABCDEFGHIJKLMNPQRSTUVWXYZ, 20AEJNSW,
29ABCDFGHKLMQRUV, 30ABCDEFGHIJKLMNPQRSTUVWXYZ,
31ABCDEFGHIJKLMNPQRSTUVWXYZ, 32ABCDEFGHIJKLMNPQRSTUVWXYZ,
33AEFJKNPSTWX, 34AE, 44BCDGHM, 45ABCDEFGHIJKLMNPQR,
46ABCDEFGHIJKLMNPQRSTU, 47ABEFJKNP

Industrial Sector 4 - ALLIANCE/ALLIANCE GATEWAY

Mapsco Numbers: 6BCDFGHLMPQRTUVXYZ, 7ABCDEFGHJKLMNPQRSTUVWXYZ,
8ABCDEFGHJKLMNPQRSTUVWXYZ, 9ABCDEFGHJKLNPSW, 20BCDGHLMQR,
21ABCDEFGHJKLM, 22ABCDEFGHJKLM

Industrial Sector 5 - NORTHEAST TARRANT COUNTY

Mapsco Numbers: 9MQRUVXYZ, 10ABCDEFGHJKLMNPQRSTUVWXYZ,
11ABCDEFGHJKLMNPQRSTUVWXYZ, 12ABCDEFGHJKLMNPQRSTUVWXYZ,
13ABCDEFGHJKLMNPQRSTUVWXYZ, 14ABCDEFGHJKLMNPQRSTUVWXYZ,
23ABCDEFGHJKLMNPQRSTUVWXYZ, 24ABCDEFGHJKLMNPQRSTUVWXYZ,
25ABCDEFGHJKLMNPQRSTUVWXYZ, 26ABCDEFGHJKLMNPQRSTUVWXYZ,
27ABCDEFGHJKLMNPQRSTUVWXYZ, 28ABCDEFGHJKLMNPQRSTUVWXYZ, 37ABCDEFGH,
38A, 39ABCDEFGHKLMPQRUV, 40ABCDEFGHJKLMNPQRSTU, 41ABCDEFGHJKLMNS,
42ABCDEFGHJKLMNPQRTUVXYZ, 56ABCDEFGH

Industrial Sector 6 - MID-CITIES (HURST, EULESS, BEDFORD)

Mapsco Numbers: 39YZ, 40WXYZ, 41PQRTUVWXYZ, 42SW, 52HLMQRTUVXYZ,
53ABCDEFGHJKLMNPQRSTUVWXYZ, 54ABCDEFGHJKLMNPQRSTUVWXYZ,
55ABCDEFGHJKLMNPQRSTUVWXYZ

Industrial Sector 7 - CENTREPORT/GSID

Mapsco Numbers: 56JKLMNPQRSTU, 70BCDFGHLMPQRTUVXYZ,
84BCDFGHLMPQRTUVXYZ, 98BCDFGHLMP

Industrial Sector 8 - NORTH ARLINGTON

Mapsco Numbers: 56WX, 68BCDFGHLMPQRTUVWXYZ,
69ABCDEFGHJKLMNPQRSTUVWXYZ, 70AEJNSW, 80PQRTUVWXYZ,
81CDFGHJKLMNPQRSTUVWXYZ, 82ABCDEFGHJKLMNPQRSTUVWXYZ,
83ABCDEFGHJKLMNPQRSTUVWXYZ, 84AEJNSW

Industrial Sector 9 - SOUTH ARLINGTON/MANSFIELD

Mapsco Numbers: 93HMR, 94ABCDEFGHJKLMNPQRSTU,
95ABCDEFGHJKLMNPQRSTUVWXYZ, 96ABCDEFGHJKLMNPQRSTUVWXYZ, 97A-Z,
98AEJNPQRSTUVWXYZ, 108DHMR, 109ABCDEFGHJKLMNPQRSTUVWXYZ,
110ABCDEFGHJKLMNPQRSTUVWXYZ, 111ABCDEFGHJKLMNPQRSTUVWXYZ,
112ABCDEFGHJKLMNPQRSTUVWXYZ, 123ABCDEFGHJKLMNPQRTUVXYZ,
124ABCDEFGHJKLMNPQRSTUVWXYZ, 125ABCDEFGHJKLMNPQRSTUVWXYZ,
126ABCDEFGHJKLMNPQRSTUVWXYZ

Industrial Sector 10 - SOUTH TARRANT COUNTY

Mapsco Numbers: 90UVYZ, 91STUVWXYZ, 92SWXYZ, 93UVWXYZ, 94WXYZ,
104BCDFGHLMPQRTUVXYZ, 105ABCDEFGHJKLMNPQRSTUVWXYZ,

106ABCDEFGHJKLMNPQRSTUVWXYZ, 107ABCDEFGHJKLMNPQRSTUVWXYZ,
108ABCDEF GJKLNPQRSTUVWXYZ, 117DHLMQRVZ, 118ABCDEFGHJKLMNPQRSTUVWXYZ,
119ABCDEFGHJKLMNPQRSTUVWXYZ, 120ABCDEFGHJKLMNPQRSTUVWXYZ,
121ABCDEFGHJKLMNPQRSTUVWXYZ, 122ABCDEFGHJKLMNPQRSTUVWXYZ, 123NSW

Industrial Sector 11 - SOUTHWEST TARRANT COUNTY

Mapsco Numbers: 85ABCDEFGHJKLMNPQRSTUVWXYZ,
86ABCDEFGHJKLMNPQRSTUVWXYZ, 99ABCDEFGHJKLMNPQRSTUVWXYZ,
100ABCDEFGHJKLMNPQRSTUVWXYZ, 101ABCDEFGHJKLMNPQRSTUVWXYZ,
102ABCDEFGHJKLMNPQRSTUVWXYZ, 103ABCDEFGHJKLMNPQRSTUVWXYZ,
113ABCDEFGHJKLMNPQRSTUVWXYZ, 114ABCDEFGHJKLMNPQRSTUVWXYZ,
115ABCDEFGHJKLMNPQRSTUVWXYZ, 116ABCDEFGHJKLMNPQRSTUVWXYZ,
117ABCDEF GJKNPSTUWXY

Industrial Sector 12 - WEST TARRANT COUNTY

Mapsco Numbers: 29EJNPSTWXYZ, 43A-Z, 44AEFJKLNPQRSTUVWXYZ, 45STUVWXYZ,
46XWY, 57ABCDEFGHJKLMNPQRSTUVWXYZ, 58ABCDEFGHJKLMNPQRSTUVWXYZ,
59ABCDEFGHIJK, 60ABC, 71ABCDEFGHJKLMNPQRSTUVWXYZ,
72ABCDEFGHJKLMNPQRSTUVWXYZ

Industrial Sector 13 - SOUTH FORT WORTH/SEMINARY

Mapsco Numbers: 76GHLMQRUVYZ, 77EJNSW, 89MR, 90BCDEF GJKLMNPQR, 91AEJN

Industrial Sector 14 - SOUTHEAST FORT WORTH

Mapsco Numbers: 65WXYZ, 66WXYZ, 67WXYZ, 77FGHKLMPQRTUVXYZ,
78ABCDEFGHJKLMNPQRSTUVWXYZ, 79ABCDEFGHJKLMNPQRSTUVWXYZ,
80ABCDEFGHJKLMN, 81ABE, 91BCDFGHKLMPQR, 92ABCDEFGHJKLMNPQRTUV,
93ABCDEFGHIJKLNPQST

Industrial Sector 15 - AIRPORT FREEWAY/BIRDVILLE

Mapsco Numbers: 51XYZ, 63FGHKLMPQRTUVXYZ, 64EFGHJKLMNPQRSTUVWXYZ,
65ABCDEFGHJKLMNPQRSTU, 66ABCDEFGHJKLMNPQRSTU,
67ABCDEFGHJKLMNPQRSTU, 68AEJN, 77BCD

Industrial Sector 16 - WEST FORT WORTH / HULEN

61YZ, 73JKLMNPQRSTUVWXYZ, 74EFGHJKLMNPQRSTUVWXYZ,
75CDEF GJKLNPQRSTUVWXYZ, 76EFJKNPSTWX,
87ABCDEFGHJKLMNPQRSTUVWXYZ, 88ABCDEFGHJKLMNPQRSTUVWXYZ,
89ABCDEFGHIJKLNPQRSTUVWXYZ, 90ASTWX, 104AEJNSW

Industrial Sector 17 - FORT WORTH - NORTHSIDE

46VZ, 47 QRSTUVWXYZ, 48W, 59HLMNPQRSTUVWXYZ,
60DEFGHJKLMNPQRSTUVWXYZ, 61ABCDEFGHIJKLMNPQRSTUVWXYZ, 62ABCDEFGHIJKNPS,
63AE, 73ABCDEFGH, 74ABCD, 75AB

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SHOPPING CENTER SECTORS

Shopping Center Sector 1 – NORTHWEST TARRANT COUNTY

Mapsco Numbers: 1A-Z, 2A-Z, 3A-Z, 4A-Z, 5A-Z, 6A-Z, 7ABCDEFGJKLNPSTWX, 15A-Z, 16A-Z, 17A-Z, 18A-Z, 19A-Z,
20A-Z, 21ABEFJNSW, 29A-Z, 30A-Z, 31A-Z, 32A-Z, 33A-Z, 34A-Z, 35AEJNSW, 43A-Z, 44A-Z, 45A-Z, 46A-Z, 47A-Z, 48A-Z, 49ABEFJKNPSTWX, 57A-Z, 58A-Z, 59A-Z, 60A-Z, 61A-Z, 62ABCDEFGHIJKLMNPQRSTUVWXYZ, 63AEJNS, 71ABCDEFGHIJKLM, 72ABCDEFGHJ, 73ABCDEFGH, 74ABCDEFGH, 75ABCDEFGH, 76ABCEFG, Parker County, Wise County

Shopping Center Sector 2 – NORTHEAST FORT WORTH

Mapsco Numbers: 7HMQRUVYZ, 8A-Z, 9AEJNPS, 21CDGHKLMNPQRSTUWXYZ, 22A-Z, 35BCDFGHKLMNPQRSTUWXYZ, 36ABCDEFGHJKLMNPQRSTUWX, 49CDGHLMQRUVYZ, 50A-Z, 63BCDFGHKLMNPQRSTUWXYZ, 64A-Z, 65ABEFGHJKLMNPQRSTUWXYZ, 66A-Z, 67A-Z, 68ABEJ, Denton County

Shopping Center Sector 3 – NORTHEAST TARRANT COUNTY

Mapsco Numbers: 9BCDFGHKLMQRTUWXYZ, 10A-Z, 11A-Z, 12A-Z, 13A-Z, 14A-Z, 23A-Z, 24A-Z, 25A-Z, 26A-Z, 27A-Z, 28A-Z, 37ABCDEFGH, 38A, 39ABCDEFGHJKLMNPQRSTU, 40ABCDEFGHJKLMNPQR, 41ABCDEFGHJKLMNS, 42ABCDEFGHJKLM

Shopping Center Sector 4 – NORTH RICHLAND HILLS

Mapsco Numbers: 36VYZ, 37JKLMNPQRSTUWXYZ, 38BCDFGHJKLMNPQRSTUWXYZ, 51ABCDEFGHJKLMNPQSTU, 52ABCEFJKNP

Shopping Center Sector 5 – HURST/RICHLAND HILLS

Mapsco Numbers: 39JNSWX, 51RVWXYZ, 52DGHLMQRSTUWXYZ, 53ABEFJKNPSTUWXYZ

Shopping Center Sector 6 – BEDFORD/EULESS

Mapsco Numbers: 39YZ, 40STUWXYZ, 41PQRTUWXYZ, 42NPQRSTUWXYZ, 53CDGHLMQRV, 54ABCDEFGHJKLMNPQRSTU, 55ABCDEFGHJKLMNPQR, 56ABCDEFGH

Shopping Center Sector 7 – ARLINGTON/CENTREPORT

Mapsco Numbers: 54WXYZ, 55STUVWXYZ, 56JKLMNOPQRSTUVWXYZ,
68CDFGHJKLMNPQRSTUVWXYZ, 69A-Z, 70A-Z, 80NPQRSTUVWXYZ,
81DFGHJKLMNPQRSTUVWXYZ,
82A-Z, 83A-Z, 84A-Z, 93HMRV, 94A-Z, 95A-Z, 96A-Z, 97A-Z, 98A-Z, 108CDHLMQRVZ, 109A-
Z, 110A-Z, 111A-Z, 112A-Z, 123A-Z, 124A-Z, 125A-Z, 126A-Z, Ellis County

Shopping Center Sector 8 – SOUTHEAST FORT WORTH/EVERMAN/FOREST HILL

Mapsco Numbers: 77BCDFGHKLMNPQRSTUWXYZ, 78A-Z, 79A-Z, 80ABCDEFGHIJKLM,
81ABCE, 91BCDFGHKLMNPQRSTUWXYZ, 92A-Z, 93ABCDEFGHIJKLNQRSTUWXYZ, 106A-Z,
107A-Z, 108ABEFGJKNPSTUWXY, 120A-Z, 121A-Z, 122A-Z

Shopping Center Sector 9 – SOUTHWEST TARRANT COUNTY

Mapsco Numbers: 71NPQRSTUVWXYZ, 72JKLMNOPQRSTUVWXYZ,
73JKLMNOPQRSTUVWXYZ, 74JKLMNOPQRSTUVWXYZ, 75JKLMNOPQRSTUVWXYZ,
76HJKLMNOPQRSTUVWXYZ, 77EJNSW, 85A-Z, 86A-Z, 87A-Z, 88A-Z, 89A-Z, 90A-Z,
91AEJNSW, 99A-Z, 100A-Z, 101A-Z, 102A-Z, 103A-Z, 104A-Z, 105A-Z, 113A-Z, 114A-Z, 115A-
Z, 116A-Z, 117A-Z, 118A-Z, 119A-Z, Johnson County

Shopping Center Sector 10 – CBD

Mapsco Numbers: 62Z, 63W, 76D, 77A

OFFICE BUILDING SECTORS

Office Sector 1 – Central Business District

Mapsco Numbers: 62YZ, 63W, 76C, 76D, 77A

Office Sector 2 – Northwest Tarrant County

Mapsco Numbers: 1A-Z, 2A-Z, 3A-Z, 4A-Z, 15A-Z, 16A-Z, 17A-Z, 18A-Z, 19A-Z, 29A-Z, 30A-Z,
31A-Z, 32A-Z, 33A-Z, 34A-Z, 44A-Z, 45A-Z, 46A-Z, 47A-Z, 48A-Z, 60D, 61ABCDEFGHM,
62ABCDEFGHJKLMNPQRSTU, 63AEJNS, Wise County, Parker County

Office Sector 3 – North Tarrant County

Mapsco: 5A-Z, 6A-Z, 7A-Z, 8A-Z, 20A-Z, 21A-Z, 22A-Z, 35A-Z,
36A-Z, 37JKLMNOPQRSTUVWXYZ, 38A-Z, 49A-Z, 50A-Z, 51A-Z, 52ABCEFGJKLNPTWZ,
63CDFGHKLMNPQRUVYZ, 64ABCDEFGHJKLMN, 65ABCDEF, Denton County

Office Sector 4 – Northeast Tarrant County

Mapsco Numbers: 9A-Z, 10A-Z, 11A-Z, 12A-Z, 13A-Z, 14A-Z,
23A-Z, 24A-Z, 25A-Z, 26A-Z, 27A-Z, 28A-Z, 37ABCDEFGH, 39A-Z,
40ABCDEFGHJKLMNPQRSTU, 41ABCDEFGHJKLMN, 42A-Z

Office Sector 5 – Mid-Cities (Hurst, Euless, Bedford)

Mapsco Numbers: 40WXYZ, 41PQRSTUVWXYZ, 52DGHMQRUVXYA, 53A-Z, 54A-Z, 55A-Z

Office Sector 6 - North Arlington

Mapsco Numbers: 56A-Z, 68A-Z, 69A-Z, 70A-Z, 81ABCDEFGHJKLM, 82ABCDEFGH,
83ABCDEFGH, 84ABCDEFGH, 89ABCDEFGH

Office Sector 7 – S. Arlington, Grand Prairie, Mansfield

Mapsco Numbers: 80NPQRSTUVWXYZ, 81NPQRSTUVWXYZ, 82NPQRSTUVWXYZ,
83JKLMNPQRSTUVWXYZ, 84JKLMNPQRSTUVWXYZ, 89KLP, 93RVZ, 94A-Z, 95A-Z, 96A-Z,
97A-Z, 98A-Z, 108A-Z, 109A-Z, 110A-Z, 111A-Z, 112A-Z, 123BCDGHM, 124A-Z, 125A-Z,
126A-Z, Ellis County

Office Sector 8 – South Tarrant County

Mapsco Numbers: 76GHLMQRUVYZ, 77EFGHJKLMNPQRSTUVWXYZ, 89MQRTUVWXYZ,
90A-Z, 91A-Z, 92JKNPQRSTUVWXYZ, 103A-Z, 104A-Z, 105A-Z, 106A-Z, 107A-Z, 116A-Z,
117A-Z, 118A-Z, 119A-Z, 120A-Z, 121A-Z, 122A-Z, 123AEFJKLMNPQRSTUVWXYZ, Johnson
County

Office Sector 9 – Southwest Tarrant County

Mapsco Numbers: 85A-Z, 86A-Z, 87A-Z, 88JKLMNPQRSTUVWXYZ, 89JPNS, 99A-Z, 100A-Z,
101A-Z,
102A-Z, 113A-Z, 114A-Z, 115A-Z

Office Sector 10 – West Tarrant County

Mapsco Numbers: 43A-Z, 57A-Z, 58A-Z, 59A-Z, 60ABCEFGHJKLMNPQRSTUVWXYZ,
61EJKLMNPQRSTUVWXYZ, 62WX, 71A-Z, 72A-Z, 73A-Z, 74A-Z, 75A-Z, 76ABEFJKNPSTWX,
88ABCDEFGH

Office Sector 11 – East Tarrant County

64PQRSTUVWXYZ, 65GHJKLMNPQRSTUVWXYZ, 66A-Z, 67A-Z, 77BCD, 78A-Z, 79A-Z,
80ABCDEFGHJKLM, 82J, 92ABCDEFGHLM, 93ABCDEFGHJKLMNPQ

WAREHOUSE SECTORS

Warehouse Sector 1 - DOWNTOWN / 7TH STREET / TRINITY RIVER

Mapsco Numbers: 62GLMQRTUVWXYZ, 63JNSW, 76ABCD, 77A

Warehouse Sector 2 - NORTH FORT WORTH

Mapsco Numbers: 20KPTUVXYZ, 21NPQRSTUVWXYZ, 22NPQRSTUVWXYZ,
33BCDGHLMQRUVYZ, 34BCDFGHJKLMNPQRSTUVWXYZ,
35ABCDEFHJKLMPQRSTUVWXYZ,
36ABCDEFHJKLMPQRSTUVWXYZ, 37JKLMNPQRSTUVWXYZ,
38BCDEFHJKLMPQRSTUVWXYZ, 39JNSTWX, 47CDGHLM,
48ABCDEFHJKLMPQRSTUVWXYZ,
49ABCDEFHJKLMPQRSTUVWXYZ, 50 ABCDEFHJKLMPQRSTUVWXYZ,
51ABCDEFHJKLMPQRSTUVWXYZ, 52ABCDEFHJKNPSW, 63BCD, 64ABCD

Warehouse Sector 3 - NORTHWEST TARRANT COUNTY

Mapsco Numbers: 1 ABCDEFHJKLMPQRSTUVWXYZ, 2
ABCDEFHJKLMPQRSTUVWXYZ,
3ABCDEFHJKLMPQRSTUVWXYZ, 4 ABCDEFHJKLMPQRSTUVWXYZ,
5ABCDEFHJKLMPQRSTUVWXYZ, 6AEJNSW, 15 ABCDEFHJKLMPQRSTUVWXYZ,
16ABCDEFHJKLMPQRSTUVWXYZ, 17ABCDEFHJKLMPQRSTUVWXYZ,
18ABCDEFHJKLMPQRSTUVWXYZ, 19ABCDEFHJKLMPQRSTUVWXYZ, 20AEJNSW,
29ABCDEFHJKLMPQRSTUVWXYZ, 30ABCDEFHJKLMPQRSTUVWXYZ,
31ABCDEFHJKLMPQRSTUVWXYZ, 32ABCDEFHJKLMPQRSTUVWXYZ,
33AEFJKNPSTWX, 34AE, 44BCDGHM, 45ABCDEFHJKLMPQR,
46ABCDEFHJKLMPQRSTU, 47ABEFJKNP

Warehouse Sector 4 - ALLIANCE/ALLIANCE GATEWAY

Mapsco Numbers: 6BCDFGHKLMNPQRSTUVWXYZ, 7ABCDEFHJKLMPQRSTUVWXYZ,
8ABCDEFHJKLMPQRSTUVWXYZ, 9ABCDEFHJKLNPSTW, 20BCDGHLMQR,
21ABCDEFHJKLM, 22ABCDEFHJKLM

Warehouse Sector 5 - NORTHEAST TARRANT COUNTY

Mapsco Numbers: 9MQRUVXYZ, 10ABCDEFHJKLMPQRSTUVWXYZ,
11ABCDEFHJKLMPQRSTUVWXYZ, 12ABCDEFHJKLMPQRSTUVWXYZ,
13ABCDEFHJKLMPQRSTUVWXYZ, 14ABCDEFHJKLMPQRSTUVWXYZ,
23ABCDEFHJKLMPQRSTUVWXYZ, 24ABCDEFHJKLMPQRSTUVWXYZ,
25ABCDEFHJKLMPQRSTUVWXYZ, 26ABCDEFHJKLMPQRSTUVWXYZ,
27ABCDEFHJKLMPQRSTUVWXYZ, 28ABCDEFHJKLMPQRSTUVWXYZ, 37ABCDEFH,
38A, 39ABCDEFHKLMPQRUV, 40ABCDEFHJKLMPQRSTU, 41ABCDEFHJKLMNS,
42ABCDEFHJKLMPQRSTU, 56ABCDEFH

Warehouse Sector 6 - MID-CITIES (HURST, EULESS, BEDFORD)

Mapsco Numbers: 39YZ, 40WXYZ, 41PQRTUVWXYZ, 42SW, 52HLMQRTUVXYZ,
53ABCDEFGHJKLMNPQRSTUVWXYZ, 54ABCDEFGHJKLMNPQRSTUVWXYZ,
55ABCDEFGHJKLMNPQRSTUVWXYZ

Warehouse Sector 7 - CENTREPORT/GSID

Mapsco Numbers: 56JKLMNPQRSTUVWXYZ, 70BCDFGHKLMNPQRSTUVWXYZ,
84BCDFGHKLMNPQRSTUVWXYZ, 98BCDFGHKLM

Warehouse Sector 8 - NORTH ARLINGTON

Mapsco Numbers: 56WX, 68BCDFGHKLMNPQRSTUVWXYZ,
69ABCDEFGHJKLMNPQRSTUVWXYZ, 70AEJNSW, 80PQRSTUVWXYZ,
81CDFGHJKLMNPQRSTUVWXYZ, 82ABCDEFGHJKLMNPQRSTUVWXYZ,
83ABCDEFGHJKLMNPQRSTUVWXYZ, 84AEJNSW

Warehouse Sector 9 - SOUTH ARLINGTON/MANSFIELD

Mapsco Numbers: 93HMR, 94ABCDEFGHJKLMNPQRSTU,
95ABCDEFGHJKLMNPQRSTUVWXYZ, 96ABCDEFGHJKLMNPQRSTUVWXYZ, 97A-Z,
98AEJNPQRSTUVWXYZ, 108DHMR, 109ABCDEFGHJKLMNPQRSTUVWXYZ,
110ABCDEFGHJKLMNPQRSTUVWXYZ, 111ABCDEFGHJKLMNPQRSTUVWXYZ,
112ABCDEFGHJKLMNPQRSTUVWXYZ, 123ABCDEFGHJKLMNPQRSTUVWXYZ,
124ABCDEFGHJKLMNPQRSTUVWXYZ, 125ABCDEFGHJKLMNPQRSTUVWXYZ,
126ABCDEFGHJKLMNPQRSTUVWXYZ

Warehouse Sector 10 - SOUTH TARRANT COUNTY

Mapsco Numbers: 90UVYZ, 91STUVWXYZ, 92SWXYZ, 93UVWXYZ, 94WXYZ,
104BCDFGHKLMNPQRSTUVWXYZ, 105ABCDEFGHJKLMNPQRSTUVWXYZ,
106ABCDEFGHJKLMNPQRSTUVWXYZ, 107ABCDEFGHJKLMNPQRSTUVWXYZ,
108ABCEFGJKLNQSTUVWXYZ, 117DHLMQRVZ, 118ABCDEFGHJKLMNPQRSTUVWXYZ,
119ABCDEFGHJKLMNPQRSTUVWXYZ, 120ABCDEFGHJKLMNPQRSTUVWXYZ,
121ABCDEFGHJKLMNPQRSTUVWXYZ, 122ABCDEFGHJKLMNPQRSTUVWXYZ, 123NSW

Warehouse Sector 11 - SOUTHWEST TARRANT COUNTY

Mapsco Numbers: 85ABCDEFGHJKLMNPQRSTUVWXYZ,
86ABCDEFGHJKLMNPQRSTUVWXYZ, 99ABCDEFGHJKLMNPQRSTUVWXYZ,
100ABCDEFGHJKLMNPQRSTUVWXYZ, 101ABCDEFGHJKLMNPQRSTUVWXYZ,
102ABCDEFGHJKLMNPQRSTUVWXYZ, 103ABCDEFGHJKLMNPQRSTUVWXYZ,
113ABCDEFGHJKLMNPQRSTUVWXYZ, 114ABCDEFGHJKLMNPQRSTUVWXYZ,
115ABCDEFGHJKLMNPQRSTUVWXYZ, 116ABCDEFGHJKLMNPQRSTUVWXYZ,
117ABCEFGJKNPSTUWXY

Warehouse Sector 12 - WEST TARRANT COUNTY

Mapsco Numbers: 29EJNPSTWXYZ, 43A-Z, 44AEFJKLNPNRSTUVWXYZ, 45STUVWXYZ,
46XWY, 57ABCDEFGHJKLMNPQRSTUVWXYZ, 58ABCDEFGHJKLMNPQRSTUVWXYZ,
59ABCDEFGJK, 60ABC, 71ABCDEFGHJKLMNPQRSTUVWXYZ,
72ABCDEFGHJKLMNPQRSTUVWXYZ

Warehouse Sector 13 - SOUTH FORT WORTH/SEMINARY

Mapsco Numbers: 76GHLMQRUVYZ, 77EJNSW, 89MR, 90BCDEFGHJKLMNPQR, 91AEJN

Warehouse Sector 14 - SOUTHEAST FORT WORTH

Mapsco Numbers: 65WXYZ, 66WXYZ, 67WXYZ, 77FGHKLMPQRTUVXYZ,
78ABCDEFGHJKLMNPQRSTUVWXYZ, 79ABCDEFGHJKLMNPQRSTUVWXYZ,
80ABCDEFGHJKLMN, 81ABE, 91BCDFGHKLMPQR, 92ABCDEFGHJKLMNPQRTUV,
93ABCDEFGJKLNQST

Warehouse Sector 15 - AIRPORT FREEWAY/BIRDVILLE

Mapsco Numbers: 51XYZ, 63FGHKLMPQRTUVXYZ, 64EFGHJKLMNPQRSTUVWXYZ,
65ABCDEFGHJKLMNPQRSTU, 66ABCDEFGHJKLMNPQRSTU,
67ABCDEFGHJKLMNPQRSTU, 68AEJN, 77BCD

Warehouse Sector 16 - WEST FORT WORTH / HULEN

61YZ, 73JKLMNPQRSTUVWXYZ, 74EFGHJKLMNPQRSTUVWXYZ,
75CDEFGHJKLMNPQRSTUVWXYZ, 76EFJKNPSTWX,
87ABCDEFGHJKLMNPQRSTUVWXYZ, 88ABCDEFGHJKLMNPQRSTUVWXYZ,
89ABCDEFGHJKLNQSTUVWXYZ, 90ASTWX, 104AEJNSW

Warehouse Sector 17 - FORT WORTH - NORTHSIDE

46VZ, 47 QRSTUVWXYZ, 48W, 59HLMNPQRSTUVWXYZ,
60DEFGHJKLMNPQRSTUVWXYZ, 61ABCDEFGHJKLMNPQRSTUVWXYZ, 62ABCDEFHJKNPS,
63AE, 73ABCDEFGH, 74ABCD, 75AB

MODIFIED 1/6/2011

Appendix E. North American Industry Classification System (NAICS)

Code	Description
112111	Beef Cattle Ranching and Farming
112920	Horses and Other Equine Production
112990	All Other Animal Production
115112	Soil Preparation, Planting, and Cultivating
541940	Veterinary Services
812910	Pet Care (except Veterinary) Services
541320	Landscape Architectural Services
561730	Landscaping Services
561730	Landscaping Services
211111	Crude Petroleum and Natural Gas Extraction
213111	Drilling Oil and Gas Wells
213112	Support Activities for Oil and Gas Operations
213112	Support Activities for Oil and Gas Operations
212312	Crushed and Broken Limestone Mining and Quarrying
212319	Other Crushed and Broken Stone Mining and Quarrying
212321	Construction Sand and Gravel Mining
236115	New Single-Family Housing Construction (except Operative Builders)
236116	New Multifamily Housing Construction (except Operative Builders)
236210	Industrial Building Construction
237310	Highway, Street, and Bridge Construction
237310	Highway, Street, and Bridge Construction
237110	Water and Sewer Line and Related Structures Construction
237990	Other Heavy and Civil Engineering Construction
238220	Plumbing, Heating, and Air-Conditioning Contractors
238320	Painting and Wall Covering Contractors
238210	Electrical Contractors and Other Wiring Installation Contractors
238140	Masonry Contractors
238310	Drywall and Insulation Contractors
238340	Tile and Terrazzo Contractors
238350	Finish Carpentry Contractors
238330	Flooring Contractors
238160	Roofing Contractors
238110	Poured Concrete Foundation and Structure Contractors
221310	Water Supply and Irrigation Systems
238120	Structural Steel and Precast Concrete Contractors
238150	Glass and Glazing Contractors
238190	Other Foundation, Structure, and Building Exterior Contractors
238910	Site Preparation Contractors
238290	Other Building Equipment Contractors
238990	All Other Specialty Trade Contractors
311611	Animal (except Poultry) Slaughtering
311512	Creamery Butter Manufacturing
311513	Cheese Manufacturing

311514 Dry, Condensed, and Evaporated Dairy Product Manufacturing
311520 Ice Cream and Frozen Dessert Manufacturing
311511 Fluid Milk Manufacturing
311422 Specialty Canning
311421 Fruit and Vegetable Canning
311941 Mayonnaise, Dressing, and Other Prepared Sauce Manufacturing
311411 Frozen Fruit, Juice, and Vegetable Manufacturing
311211 Flour Milling
311111 Dog and Cat Food Manufacturing
311999 All Other Miscellaneous Food Manufacturing
311812 Commercial Bakeries
311312 Cane Sugar Refining
311330 Confectionery Manufacturing from Purchased Chocolate
311340 Non-chocolate Confectionery Manufacturing
311911 Roasted Nuts and Peanut Butter Manufacturing
311223 Other Oilseed Processing
311225 Fats and Oils Refining and Blending
311225 Fats and Oils Refining and Blending
312111 Soft Drink Manufacturing
312130 Wineries
312140 Distilleries
312111 Soft Drink Manufacturing
311930 Flavoring Syrup and Concentrate Manufacturing
311711 Seafood Canning
311920 Coffee and Tea Manufacturing
311919 Other Snack Food Manufacturing
312113 Ice Manufacturing
311823 Dry Pasta Manufacturing
311999 All Other Miscellaneous Food Manufacturing
313210 Broad woven Fabric Mills
313249 Other Knit Fabric and Lace Mills
313311 Broad woven Fabric Finishing Mills
313221 Narrow Fabric Mills
315111 Sheer Hosiery Mills
315119 Other Hosiery and Sock Mills
315191 Outerwear Knitting Mills
315192 Underwear and Nightwear Knitting Mills
313312 Textile and Fabric Finishing (except Broad woven Fabric) Mills
313312 Textile and Fabric Finishing (except Broad woven Fabric) Mills
314110 Carpet and Rug Mills
313111 Yarn Spinning Mills
313113 Thread Mills
314991 Rope, Cordage, and Twine Mills
314999 All Other Miscellaneous Textile Product Mills
315222 Men's and Boy's Cut and Sew Suit, Coat, and Overcoat Manufacturing
315223 Men's and Boy's Cut and Sew Shirt (except Work Shirt) Manufacturing
315224 Men's and Boy's Cut and Sew Trouser, Slack, and Jean Manufacturing
315228 Men's and Boy's Cut and Sew Other Outerwear Manufacturing

315232 Women's and Girl's Cut and Sew Blouse and Shirt Manufacturing
315239 Women's and Girl's Cut and Sew Other Outerwear Manufacturing
315231 Women's and Girl's Cut and Sew Lingerie, Loungewear, and Nightwear Manufacturing
315991 Hat, Cap, and Millinery Manufacturing
315233 Women's and Girl's Cut and Sew Dress Manufacturing
315234 Women's and Girl's Cut and Sew Suit, Coat, Tailored Jacket, and Skirt Manufacturing
315292 Fur and Leather Apparel Manufacturing
315992 Glove and Mitten Manufacturing
315999 Other Apparel Accessories and Other Apparel Manufacturing
314121 Curtain and Drapery Mills
314912 Canvas and Related Product Mills
314999 All Other Miscellaneous Textile Product Mills
313222 Schiffli Machine Embroidery
314999 All Other Miscellaneous Textile Product Mills
113310 Logging
321113 Sawmills
321113 Sawmills
321918 Other Millwork (including Flooring)
337110 Wood Kitchen Cabinet and Countertop Manufacturing
321213 Engineered Wood Member (except Truss) Manufacturing
321920 Wood Container and Pallet Manufacturing
321920 Wood Container and Pallet Manufacturing
321991 Manufactured Home (Mobile Home) Manufacturing
321992 Prefabricated Wood Building Manufacturing
321114 Wood Preservation
321999 All Other Miscellaneous Wood Product Manufacturing
337122 Non-upholstered Wood Household Furniture Manufacturing
337121 Upholstered Household Furniture Manufacturing
337124 Metal Household Furniture Manufacturing
337910 Mattress Manufacturing
337129 Wood Television, Radio, and Sewing Machine Cabinet Manufacturing
337125 Household Furniture (except Wood and Metal) Manufacturing
337211 Wood Office Furniture Manufacturing
337214 Office Furniture (except Wood) Manufacturing
337127 Institutional Furniture Manufacturing
337215 Showcase, Partition, Shelving, and Locker Manufacturing
337215 Showcase, Partition, Shelving, and Locker Manufacturing
337920 Blind and Shade Manufacturing
337127 Institutional Furniture Manufacturing
322110 Pulp Mills
322121 Paper (except Newsprint) Mills
322130 Paperboard Mills
322213 Setup Paperboard Box Manufacturing
322211 Corrugated and Solid Fiber Box Manufacturing
322214 Fiber Can, Tube, Drum, and Similar Products Manufacturing
322215 Non-folding Sanitary Food Container Manufacturing
322212 Folding Paperboard Box Manufacturing
322221 Coated and Laminated Packaging Paper Manufacturing

322222 Coated and Laminated Paper Manufacturing
322223 Coated Paper Bag and Pouch Manufacturing
322224 Uncoated Paper and Multiwall Bag Manufacturing
322231 Die-Cut Paper and Paperboard Office Supplies Manufacturing
322291 Sanitary Paper Product Manufacturing
322232 Envelope Manufacturing
322233 Stationery, Tablet, and Related Product Manufacturing
322299 All Other Converted Paper Product Manufacturing
511110 Newspaper Publishers
511120 Periodical Publishers
511130 Book Publishers
323117 Books Printing
511199 All Other Publishers
323110 Commercial Lithographic Printing
323111 Commercial Gravure Printing
323119 Other Commercial Printing
323116 Manifold Business Forms Printing
511191 Greeting Card Publishers
323118 Blank book, Loose leaf Binders, and Devices Manufacturing
323121 Trade binding and Related Work
323122 Prepress Services
323122 Prepress Services
325181 Alkalis and Chlorine Manufacturing
325120 Industrial Gas Manufacturing
325131 Inorganic Dye and Pigment Manufacturing
325188 All Other Basic Inorganic Chemical Manufacturing
325211 Plastics Material and Resin Manufacturing
325212 Synthetic Rubber Manufacturing
325221 Cellulosic Organic Fiber Manufacturing
325222 Non-cellulosic Organic Fiber Manufacturing
325411 Medicinal and Botanical Manufacturing
325412 Pharmaceutical Preparation Manufacturing
325413 In-Vitro Diagnostic Substance Manufacturing
325414 Biological Product (except Diagnostic) Manufacturing
325611 Soap and Other Detergent Manufacturing
325612 Polish and Other Sanitation Good Manufacturing
325613 Surface Active Agent Manufacturing
325620 Toilet Preparation Manufacturing
325510 Paint and Coating Manufacturing
325199 All Other Basic Organic Chemical Manufacturing
325320 Pesticide and Other Agricultural Chemical Manufacturing
325520 Adhesive Manufacturing
325920 Explosives Manufacturing
325910 Printing Ink Manufacturing
325182 Carbon Black Manufacturing
325998 All Other Miscellaneous Chemical Product and Preparation Manufacturing
324110 Petroleum Refineries
324121 Asphalt Paving Mixture and Block Manufacturing

324122 Asphalt Shingle and Coating Materials Manufacturing
324191 Petroleum Lubricating Oil and Grease Manufacturing
324199 All Other Petroleum and Coal Products Manufacturing
326211 Tire Manufacturing (except Retreading)
316211 Rubber and Plastics Footwear Manufacturing
326220 Rubber and Plastics Hoses and Belting Manufacturing
339991 Gasket, Packing, and Sealing Device Manufacturing
326291 Rubber Product Manufacturing for Mechanical Use
326299 All Other Rubber Product Manufacturing
326113 Un-laminated Plastics Film and Sheet (except Packaging) Manufacturing
326121 Un-laminated Plastics Profile Shape Manufacturing
326130 Laminated Plastics Plate, Sheet (except Packaging), and Shape Manufacturing
326122 Plastics Pipe and Pipe Fitting Manufacturing
326160 Plastics Bottle Manufacturing
326140 Polystyrene Foam Product Manufacturing
325991 Custom Compounding of Purchased Resins
326191 Plastics Plumbing Fixture Manufacturing
326199 All Other Plastics Product Manufacturing
316110 Leather and Hide Tanning and Finishing
316999 All Other Leather Good and Allied Product Manufacturing
316213 Men's Footwear (except Athletic) Manufacturing
316214 Women's Footwear (except Athletic) Manufacturing
316219 Other Footwear Manufacturing
315992 Glove and Mitten Manufacturing
316991 Luggage Manufacturing
316992 Women's Handbag and Purse Manufacturing
316993 Personal Leather Good (except Women's Handbag and Purse) Manufacturing
316999 All Other Leather Good and Allied Product Manufacturing
327211 Flat Glass Manufacturing
327213 Glass Container Manufacturing
327212 Other Pressed and Blown Glass and Glassware Manufacturing
327215 Glass Product Manufacturing Made of Purchased Glass
327310 Cement Manufacturing
327121 Brick and Structural Clay Tile Manufacturing
327122 Ceramic Wall and Floor Tile Manufacturing
327124 Clay Refractory Manufacturing
327123 Other Structural Clay Product Manufacturing
327112 Vitreous China, Fine Earthenware, and Other Pottery Product Manufacturing
327331 Concrete Block and Brick Manufacturing
327390 Other Concrete Product Manufacturing
327320 Ready-Mix Concrete Manufacturing
327410 Lime Manufacturing
327420 Gypsum Product Manufacturing
327991 Cut Stone and Stone Product Manufacturing
327910 Abrasive Product Manufacturing
327993 Mineral Wool Manufacturing
327125 Non-clay Refractory Manufacturing
327999 All Other Miscellaneous Non-metallic Mineral Product Manufacturing

331111 Iron and Steel Mills
331511 Iron Foundries
331513 Steel Foundries (except Investment)
331419 Primary Smelting and Refining of Non-ferrous Metal (except Copper and Aluminum)
331492 Secondary Smelting, Refining, and Alloying of Non-ferrous Metal (except Copper and Aluminum)
331421 Copper Rolling, Drawing, and Extruding
331491 Non-ferrous Metal (except Copper and Aluminum) Rolling, Drawing, and Extruding
335929 Other Communication and Energy Wire Manufacturing
331521 Aluminum Die-Casting Foundries
331522 Non-ferrous (except Aluminum) Die-Casting Foundries
331524 Aluminum Foundries (except Die-Casting)
331525 Copper Foundries (except Die-Casting)
331528 Other Non-ferrous Foundries (except Die-Casting)
332811 Metal Heat Treating
332618 Other Fabricated Wire Product Manufacturing
332431 Metal Can Manufacturing
332439 Other Metal Container Manufacturing
332211 Cutlery and Flatware (except Precious) Manufacturing
332212 Hand and Edge Tool Manufacturing
332510 Hardware Manufacturing
332998 Enameled Iron and Metal Sanitary Ware Manufacturing
332913 Plumbing Fixture Fitting and Trim Manufacturing
333414 Heating Equipment (except Warm Air Furnaces) Manufacturing
332312 Fabricated Structural Metal Manufacturing
332321 Metal Window and Door Manufacturing
332313 Plate Work Manufacturing
332322 Sheet Metal Work Manufacturing
332323 Ornamental and Architectural Metal Work Manufacturing
332999 All Other Miscellaneous Fabricated Metal Product Manufacturing
332721 Precision Turned Product Manufacturing
332722 Bolt, Nut, Screw, Rivet, and Washer Manufacturing
332111 Iron and Steel Forging
332112 Non-ferrous Forging
332116 Metal Stamping
332115 Crown and Closure Manufacturing
332116 Metal Stamping
332813 Electroplating, Plating, Polishing, Anodizing, and Coloring
332812 Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers
332994 Small Arms Manufacturing
332995 Other Ordnance and Accessories Manufacturing
332911 Industrial Valve Manufacturing
332912 Fluid Power Valve and Hose Fitting Manufacturing
332611 Spring (Heavy Gauge) Manufacturing
332919 Other Metal Valve and Pipe Fitting Manufacturing
332611 Spring (Heavy Gauge) Manufacturing
332618 Other Fabricated Wire Product Manufacturing
322225 Laminated Aluminum Foil Manufacturing for Flexible Packaging Uses
332996 Fabricated Pipe and Pipe Fitting Manufacturing

332999 All Other Miscellaneous Fabricated Metal Product Manufacturing
333611 Turbine and Turbine Generator Set Units Manufacturing
333618 Other Engine Equipment Manufacturing
333111 Farm Machinery and Equipment Manufacturing
333112 Lawn and Garden Tractor and Home Lawn and Garden Equipment Manufacturing
333120 Construction Machinery Manufacturing
333131 Mining Machinery and Equipment Manufacturing
333132 Oil and Gas Field Machinery and Equipment Manufacturing
333921 Elevator and Moving Stairway Manufacturing
333922 Conveyor and Conveying Equipment Manufacturing
333923 Overhead Traveling Crane, Hoist, and Monorail System Manufacturing
333924 Industrial Truck, Tractor, Trailer, and Stacker Machinery Manufacturing
333512 Machine Tool (Metal Cutting Types) Manufacturing
333513 Machine Tool (Metal Forming Types) Manufacturing
333514 Special Die and Tool, Die Set, Jig, and Fixture Manufacturing
333518 Other Metalworking Machinery Manufacturing
333210 Sawmill and Woodworking Machinery Manufacturing
333291 Paper Industry Machinery Manufacturing
333293 Printing Machinery and Equipment Manufacturing
333294 Food Product Machinery Manufacturing
333298 All Other Industrial Machinery Manufacturing
333412 Industrial and Commercial Fan and Blower Manufacturing
333993 Packaging Machinery Manufacturing
333612 Speed Changer, Industrial High-Speed Drive, and Gear Manufacturing
333994 Industrial Process Furnace and Oven Manufacturing
333613 Mechanical Power Transmission Equipment Manufacturing
333999 All Other Miscellaneous General Purpose Machinery Manufacturing
334111 Electronic Computer Manufacturing
334112 Computer Storage Device Manufacturing
334113 Computer Terminal Manufacturing
334119 Other Computer Peripheral Equipment Manufacturing
333313 Office Machinery Manufacturing
333313 Office Machinery Manufacturing
333311 Automatic Vending Machine Manufacturing
333415 Air-Conditioning and Warm Air Heating Equip. and Commercial and Ind. Refrigeration Equip. Mfg.
333319 Other Commercial and Service Industry Machinery Manufacturing
336311 Carburetor, Piston, Piston Ring, and Valve Manufacturing
333996 Fluid Power Pump and Motor Manufacturing
333999 All Other Miscellaneous General Purpose Machinery Manufacturing
335311 Power, Distribution, and Specialty Transformer Manufacturing
335313 Switchgear and Switchboard Apparatus Manufacturing
335312 Motor and Generator Manufacturing
335991 Carbon and Graphite Product Manufacturing
335314 Relay and Industrial Control Manufacturing
335999 All Other Miscellaneous Electrical Equipment and Component Manufacturing
335221 Household Cooking Appliance Manufacturing
335211 Electric Housewares and Household Fan Manufacturing
335228 Other Major Household Appliance Manufacturing

335110 Electric Lamp Bulb and Part Manufacturing
335931 Current-Carrying Wiring Device Manufacturing
335932 Non-current-Carrying Wiring Device Manufacturing
335121 Residential Electric Lighting Fixture Manufacturing
335122 Commercial, Industrial, and Institutional Electric Lighting Fixture Manufacturing
335129 Other Lighting Equipment Manufacturing
334310 Audio and Video Equipment Manufacturing
334612 Prerecorded Compact Disc (except Software), Tape, and Record Reproducing
334210 Telephone Apparatus Manufacturing
334220 Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing
334290 Other Communications Equipment Manufacturing
334411 Electron Tube Manufacturing
334418 Printed Circuit Assembly (Electronic Assembly) Manufacturing
334413 Semiconductor and Related Device Manufacturing
334414 Electronic Capacitor Manufacturing
334419 Other Electronic Component Manufacturing
335912 Primary Battery Manufacturing
335999 All Other Miscellaneous Electrical Equipment and Component Manufacturing
336211 Motor Vehicle Body Manufacturing
336120 Heavy Duty Truck Manufacturing
336399 All Other Motor Vehicle Parts Manufacturing
336212 Truck Trailer Manufacturing
336213 Motor Home Manufacturing
336411 Aircraft Manufacturing
336412 Aircraft Engine and Engine Parts Manufacturing
336413 Other Aircraft Parts and Auxiliary Equipment Manufacturing
336611 Ship Building and Repairing
336510 Railroad Rolling Stock Manufacturing
336991 Motorcycle, Bicycle, and Parts Manufacturing
336414 Guided Missile and Space Vehicle Manufacturing
336214 Travel Trailer and Camper Manufacturing
336999 All Other Transportation Equipment Manufacturing
334511 Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Mfg.
334512 Automatic Environmental Control Manufacturing for Residential, Commercial, and Appliance Use
334513 Instruments and Related Products Mfg. for Measuring, Displaying, and Controlling Ind. Process Variables
334514 Totalizing Fluid Meter and Counting Device Manufacturing
334515 Instrument Manufacturing for Measuring and Testing Electricity and Electrical Signals
334516 Analytical Laboratory Instrument Manufacturing
333314 Optical Instrument and Lens Manufacturing
334519 Other Measuring and Controlling Device Manufacturing
339112 Surgical and Medical Instrument Manufacturing
339113 Surgical Appliance and Supplies Manufacturing
339114 Dental Equipment and Supplies Manufacturing
334517 Irradiation Apparatus Manufacturing
334510 Electro medical and Electrotherapeutic Apparatus Manufacturing
339115 Ophthalmic Goods Manufacturing
333315 Photographic and Photocopying Equipment Manufacturing
334518 Watch, Clock, and Part Manufacturing

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339911 Jewelry (except Costume) Manufacturing
332211 Cutlery and Flatware (except Precious) Manufacturing
339913 Jewelers Material and Lapidary Work Manufacturing
339992 Musical Instrument Manufacturing
339931 Doll and Stuffed Toy Manufacturing
339932 Game, Toy, and Children's Vehicle Manufacturing
339920 Sporting and Athletic Goods Manufacturing
339941 Pen and Mechanical Pencil Manufacturing
339943 Marking Device Manufacturing
339914 Costume Jewelry and Novelty Manufacturing
339993 Fastener, Button, Needle, and Pin Manufacturing
339950 Sign Manufacturing
339999 All Other Miscellaneous Manufacturing
482111 Line-Haul Railroads
485111 Mixed Mode Transit Systems
485999 All Other Transit and Ground Passenger Transportation
485310 Taxi Service
485210 Interurban and Rural Bus Transportation
485510 Charter Bus Industry
485510 Charter Bus Industry
485410 School and Employee Bus Transportation
488490 Other Support Activities for Road Transportation
484110 General Freight Trucking, Local
484121 General Freight Trucking, Long-Distance, Truckload
484122 General Freight Trucking, Long-Distance, Less Than Truckload
492110 Couriers and Express Delivery Services
493130 Farm Product Warehousing and Storage
493120 Refrigerated Warehousing and Storage
493110 General Warehousing and Storage
493190 Other Warehousing and Storage
488490 Other Support Activities for Road Transportation
713930 Marinas
481111 Scheduled Passenger Air Transportation
481212 Non-scheduled Chartered Freight Air Transportation
481211 Non-scheduled Chartered Passenger Air Transportation
488119 Other Airport Operations
488190 Other Support Activities for Air Transportation
486910 Pipeline Transportation of Refined Petroleum Products
561510 Travel Agencies
561520 Tour Operators
561599 All Other Travel Arrangement and Reservation Services
488510 Freight Transportation Arrangement
532411 Commercial Air, Rail, and Water Transportation Equipment Rental and Leasing
488991 Packing and Crating
488999 All Other Support Activities for Transportation
517210 Wireless Telecommunications Carriers (except Satellite)
517110 Wired Telecommunications Carriers
517919 All Other Telecommunications

- 515112 Radio Stations
- 515120 Television Broadcasting
- 515210 Cable and Other Subscription Programming
- 517919 All Other Telecommunications
- 517919 All Other Telecommunications
- 221119 Other Electric Power Generation
- 486210 Pipeline Transportation of Natural Gas
- 221210 Natural Gas Distribution
- 221121 Electric Bulk Power Transmission and Control
- 221122 Electric Power Distribution
- 221310 Water Supply and Irrigation Systems
- 562219 Other Non-hazardous Waste Treatment and Disposal
- 562998 All Other Miscellaneous Waste Management Services
- 221330 Steam and Air-Conditioning Supply
- 221310 Water Supply and Irrigation Systems
- 423110 Automobile and Other Motor Vehicle Merchant Wholesalers
- 423120 Motor Vehicle Supplies and New Parts Merchant Wholesalers
- 423130 Tire and Tube Merchant Wholesalers
- 423140 Motor Vehicle Parts (Used) Merchant Wholesalers
- 423210 Furniture Merchant Wholesalers
- 423220 Home Furnishing Merchant Wholesalers
- 423310 Lumber, Plywood, Millwork, and Wood Panel Merchant Wholesalers
- 423320 Brick, Stone, and Related Construction Material Merchant Wholesalers
- 423330 Roofing, Siding, and Insulation Material Merchant Wholesalers
- 423390 Other Construction Material Merchant Wholesalers
- 423410 Photographic Equipment and Supplies Merchant Wholesalers
- 423420 Office Equipment Merchant Wholesalers
- 423430 Computer and Computer Peripheral Equipment and Software Merchant Wholesalers
- 423440 Other Commercial Equipment Merchant Wholesalers
- 423450 Medical, Dental, and Hospital Equipment and Supplies Merchant Wholesalers
- 423460 Ophthalmic Goods Merchant Wholesalers
- 423490 Other Professional Equipment and Supplies Merchant Wholesalers
- 423510 Metal Service Centers and Other Metal Merchant Wholesalers
- 423610 Electrical Apparatus and Equipment, Wiring Supplies, and Related Equipment Merchant Wholesalers
- 423620 Electrical and Electronic Appliance, Television, and Radio Set Merchant Wholesalers
- 423690 Other Electronic Parts and Equipment Merchant Wholesalers
- 423710 Hardware Merchant Wholesalers
- 423720 Plumbing and Heating Equipment and Supplies (Hydronics) Merchant Wholesalers
- 423730 Warm Air Heating and Air-Conditioning Equipment and Supplies Merchant Wholesalers
- 423740 Refrigeration Equipment and Supplies Merchant Wholesalers
- 423810 Construction and Mining (except Oil Well) Machinery and Equipment Merchant Wholesalers
- 423820 Farm and Garden Machinery and Equipment Merchant Wholesalers
- 423830 Industrial Machinery and Equipment Merchant Wholesalers
- 423840 Industrial Supplies Merchant Wholesalers
- 423850 Service Establishment Equipment and Supplies Merchant Wholesalers
- 423860 Transportation Equipment and Supplies (except Motor Vehicle) Merchant Wholesalers
- 423910 Sporting and Recreational Goods and Supplies Merchant Wholesalers
- 423920 Toy and Hobby Goods and Supplies Merchant Wholesalers

423930 Recyclable Material Merchant Wholesalers
423940 Jewelry, Watch, Precious Stone, and Precious Metal Merchant Wholesalers
423990 Other Miscellaneous Durable Goods Merchant Wholesalers
424110 Printing and Writing Paper Merchant Wholesalers
424120 Stationery and Office Supplies Merchant Wholesalers
424130 Industrial and Personal Service Paper Merchant Wholesalers
424210 Drugs and Druggists Sundries Merchant Wholesalers
424310 Piece Goods, Notions, and Other Dry Goods Merchant Wholesalers
424320 Men's and Boy's Clothing and Furnishings Merchant Wholesalers
424330 Women's, Children's, and Infants Clothing and Accessories Merchant Wholesalers
424340 Footwear Merchant Wholesalers
424410 General Line Grocery Merchant Wholesalers
424420 Packaged Frozen Food Merchant Wholesalers
424430 Dairy Product (except Dried or Canned) Merchant Wholesalers
424440 Poultry and Poultry Product Merchant Wholesalers
424450 Confectionery Merchant Wholesalers
424460 Fish and Seafood Merchant Wholesalers
424470 Meat and Meat Product Merchant Wholesalers
424480 Fresh Fruit and Vegetable Merchant Wholesalers
424490 Other Grocery and Related Products Merchant Wholesalers
424510 Grain and Field Bean Merchant Wholesalers
424520 Livestock Merchant Wholesalers
424590 Other Farm Product Raw Material Merchant Wholesalers
424610 Plastics Materials and Basic Forms and Shapes Merchant Wholesalers
424690 Other Chemical and Allied Products Merchant Wholesalers
424710 Petroleum Bulk Stations and Terminals
424720 Petroleum and Petroleum Products Merchant Wholesalers (except Bulk Stations and Terminals)
424810 Beer and Ale Merchant Wholesalers
424820 Wine and Distilled Alcoholic Beverage Merchant Wholesalers
424910 Farm Supplies Merchant Wholesalers
424920 Book, Periodical, and Newspaper Merchant Wholesalers
424930 Flower, Nursery Stock, and Florists Supplies Merchant Wholesalers
424940 Tobacco and Tobacco Product Merchant Wholesalers
424950 Paint, Varnish, and Supplies Merchant Wholesalers
424990 Other Miscellaneous Non-durable Goods Merchant Wholesalers
444110 Home Centers
444120 Paint and Wallpaper Stores
444130 Hardware Stores
444220 Nursery, Garden Center, and Farm Supply Stores
453930 Manufactured (Mobile) Home Dealers
452111 Department Stores (except Discount Department Stores)
452990 All Other General Merchandise Stores
452990 All Other General Merchandise Stores
445110 Supermarkets and Other Grocery (except Convenience) Stores
445210 Meat Markets
445230 Fruit and Vegetable Markets
445292 Confectionery and Nut Stores
445299 All Other Specialty Food Stores

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311811 Retail Bakeries
445299 All Other Specialty Food Stores
441110 New Car Dealers
441120 Used Car Dealers
441310 Automotive Parts and Accessories Stores
447190 Other Gasoline Stations
441222 Boat Dealers
441221 Motorcycle, ATV, and Personal Watercraft Dealers
441229 All Other Motor Vehicle Dealers
448110 Men's Clothing Stores
448120 Women's Clothing Stores
448150 Clothing Accessories Stores
448130 Children's and Infants Clothing Stores
448140 Family Clothing Stores
448210 Shoe Stores
448190 Other Clothing Stores
442110 Furniture Stores
442210 Floor Covering Stores
442291 Window Treatment Stores
442299 All Other Home Furnishings Stores
443111 Household Appliance Stores
443112 Radio, Television, and Other Electronics Stores
443120 Computer and Software Stores
451220 Prerecorded Tape, Compact Disc, and Record Stores
451140 Musical Instrument and Supplies Stores
722110 Full-Service Restaurants
722410 Drinking Places (Alcoholic Beverages)
446110 Pharmacies and Drug Stores
445310 Beer, Wine, and Liquor Stores
453310 Used Merchandise Stores
451110 Sporting Goods Stores
451211 Book Stores
453210 Office Supplies and Stationery Stores
448310 Jewelry Stores
451120 Hobby, Toy, and Game Stores
443130 Camera and Photographic Supplies Stores
453220 Gift, Novelty, and Souvenir Stores
448320 Luggage and Leather Goods Stores
451130 Sewing, Needlework, and Piece Goods Stores
454113 Mail-Order Houses
454210 Vending Machine Operators
454390 Other Direct Selling Establishments
454312 Liquefied Petroleum Gas (Bottled Gas) Dealers
453110 Florists
453991 Tobacco Stores
451212 News Dealers and Newsstands
446130 Optical Goods Stores
453998 All Other Miscellaneous Store Retailers (except Tobacco Stores)

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521110 Monetary Authorities-Central Bank
522110 Commercial Banking
522110 Commercial Banking
522120 Savings Institutions
522130 Credit Unions
522130 Credit Unions
522292 Real Estate Credit
522291 Consumer Lending
522210 Credit Card Issuing
522190 Other Depository Credit Intermediation
522390 Other Activities Related to Credit Intermediation
522310 Mortgage and Non-mortgage Loan Brokers
523120 Securities Brokerage
523140 Commodity Contracts Brokerage
523930 Investment Advice
523210 Securities and Commodity Exchanges
524113 Direct Life Insurance Carriers
524114 Direct Health and Medical Insurance Carriers
524114 Direct Health and Medical Insurance Carriers
524126 Direct Property and Casualty Insurance Carriers
524127 Direct Title Insurance Carriers
525120 Health and Welfare Funds
524128 Other Direct Insurance (except Life, Health, and Medical) Carriers
524210 Insurance Agencies and Brokerages
531120 Lessors of Non-residential Buildings (except Mini-warehouses)
531110 Lessors of Residential Buildings and Dwellings
531110 Lessors of Residential Buildings and Dwellings
531190 Lessors of Other Real Estate Property
531190 Lessors of Other Real Estate Property
531210 Offices of Real Estate Agents and Brokers
541191 Title Abstract and Settlement Offices
237210 Land Subdivision
812220 Cemeteries and Crematories
551112 Offices of Other Holding Companies
525910 Open-End Investment Funds
525990 Other Financial Vehicles
525920 Trusts, Estates, and Agency Accounts
533110 Lessors of Non-financial Intangible Assets (except Copyrighted Works)
523999 Miscellaneous Financial Investment Activities
721110 Hotels (except Casino Hotels) and Motels
721310 Rooming and Boarding Houses
721214 Recreational and Vacation Camps (except Campgrounds)
721211 RV (Recreational Vehicle) Parks and Campgrounds
812320 Dry cleaning and Laundry Services (except Coin-Operated)
812331 Linen Supply
812310 Coin-Operated Laundries and Drycleaners
561740 Carpet and Upholstery Cleaning Services
812332 Industrial Launderers

812320 Dry cleaning and Laundry Services (except Coin-Operated)
541921 Photography Studios, Portrait
812112 Beauty Salons
812111 Barber Shops
811430 Footwear and Leather Goods Repair
812210 Funeral Homes and Funeral Services
541213 Tax Preparation Services
812199 Other Personal Care Services
541810 Advertising Agencies
541850 Display Advertising
541840 Media Representatives
541890 Other Services Related to Advertising
561440 Collection Agencies
561450 Credit Bureaus
541860 Direct Mail Advertising
561439 Other Business Service Centers (including Copy Shops)
541922 Commercial Photography
541430 Graphic Design Services
561492 Court Reporting and Stenotype Services
561710 Exterminating and Pest Control Services
561790 Other Services to Buildings and Dwellings
532291 Home Health Equipment Rental
532412 Construction, Mining, and Forestry Machinery and Equipment Rental and Leasing
532490 Other Commercial and Industrial Machinery and Equipment Rental and Leasing
561311 Employment Placement Agencies
561320 Temporary Help Services
541511 Custom Computer Programming Services
511210 Software Publishers
541512 Computer Systems Design Services
518210 Data Processing, Hosting, and Related Services
519190 All Other Information Services
541513 Computer Facilities Management Services
532420 Office Machinery and Equipment Rental and Leasing
811212 Computer and Office Machine Repair and Maintenance
541519 Other Computer Related Services
561613 Armored Car Services
561621 Security Systems Services (except Locksmiths)
519110 News Syndicates
812921 Photofinishing Laboratories (except One-Hour)
541990 All Other Professional, Scientific, and Technical Services
532120 Truck, Utility Trailer, and RV (Recreational Vehicle) Rental and Leasing
532111 Passenger Car Rental
532112 Passenger Car Leasing
532120 Truck, Utility Trailer, and RV (Recreational Vehicle) Rental and Leasing
812930 Parking Lots and Garages
811121 Automotive Body, Paint, and Interior Repair and Maintenance
811112 Automotive Exhaust System Repair
326212 Tire Retreading

811122 Automotive Glass Replacement Shops
811113 Automotive Transmission Repair
811111 General Automotive Repair
811198 All Other Automotive Repair and Maintenance
811192 Car Washes
811198 All Other Automotive Repair and Maintenance
811211 Consumer Electronics Repair and Maintenance
811310 Commercial and Industrial Machinery and Equipment Repair and Maintenance
811219 Other Electronic and Precision Equipment Repair and Maintenance
811490 Other Personal and Household Goods Repair and Maintenance
811420 Re-upholstery and Furniture Repair
811310 Commercial and Industrial Machinery and Equipment Repair and Maintenance
335312 Motor and Generator Manufacturing
811490 Other Personal and Household Goods Repair and Maintenance
512110 Motion Picture and Video Production
512199 Other Motion Picture and Video Industries
512120 Motion Picture and Video Distribution
512120 Motion Picture and Video Distribution
512131 Motion Picture Theaters (except Drive-Ins)
512132 Drive-In Motion Picture Theaters
532230 Video Tape and Disc Rental
713990 All Other Amusement and Recreation Industries
711110 Theater Companies and Dinner Theaters
711190 Other Performing Arts Companies
713950 Bowling Centers
711320 Promoters of Performing Arts, Sports, and Similar Events without Facilities
711212 Racetracks
713940 Fitness and Recreational Sports Centers
713910 Golf Courses and Country Clubs
713120 Amusement Arcades
713110 Amusement and Theme Parks
713990 All Other Amusement and Recreation Industries
713990 All Other Amusement and Recreation Industries
621111 Offices of Physicians (except Mental Health Specialists)
621210 Offices of Dentists
621111 Offices of Physicians (except Mental Health Specialists)
621310 Offices of Chiropractors
621320 Offices of Optometrists
621391 Offices of Podiatrists
621399 Offices of All Other Miscellaneous Health Practitioners
623311 Continuing Care Retirement Communities
623110 Nursing Care Facilities
623990 Other Residential Care Facilities
622110 General Medical and Surgical Hospitals
622210 Psychiatric and Substance Abuse Hospitals
622310 Specialty (except Psychiatric and Substance Abuse) Hospitals
621511 Medical Laboratories
339116 Dental Laboratories

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621610 Home Health Care Services
621492 Kidney Dialysis Centers
621498 All Other Outpatient Care Centers
621999 All Other Miscellaneous Ambulatory Health Care Services
541110 Offices of Lawyers
611420 Computer Training
611410 Business and Secretarial Schools
611519 Other Technical and Trade Schools
611699 All Other Miscellaneous Schools and Instruction
624190 Other Individual and Family Services
624310 Vocational Rehabilitation Services
624410 Child Day Care Services
623312 Homes for the Elderly
813319 Other Social Advocacy Organizations
712110 Museums
712130 Zoos and Botanical Gardens
813910 Business Associations
813920 Professional Organizations
813930 Labor Unions and Similar Labor Organizations
813410 Civic and Social Organizations
813940 Political Organizations
813110 Religious Organizations
813910 Business Associations
541330 Engineering Services
541310 Architectural Services
541370 Surveying and Mapping (except Geophysical) Services
541211 Offices of Certified Public Accountants
541712 Research and Development in the Physical, Engineering, and Life Sciences (except Biotechnology)
541720 Research and Development in the Social Sciences and Humanities
541720 Research and Development in the Social Sciences and Humanities
541380 Testing Laboratories
561110 Office Administrative Services
541611 Administrative Management and General Management Consulting Services
541820 Public Relations Agencies
541618 Other Management Consulting Services
519190 All Other Information Services
812990 All Other Personal Services
722110 Full-Service Restaurants
722110 Full-Service Restaurants
722211 Limited-Service Restaurants
722211 Limited-Service Restaurants
722211 Limited-Service Restaurants
722211 Limited-Service Restaurants
722110 Full-Service Restaurants
722211 Limited-Service Restaurants
722211 Limited-Service Restaurants
238990 All Other Specialty Trade Contractors
238990 All Other Specialty Trade Contractors

238990 All Other Specialty Trade Contractors
238990 All Other Specialty Trade Contractors
238990 All Other Specialty Trade Contractors
238990 All Other Specialty Trade Contractors
238990 All Other Specialty Trade Contractors
321999 All Other Miscellaneous Wood Product Manufacturing
336413 Other Aircraft Parts and Auxiliary Equipment Manufacturing
493190 Other Warehousing and Storage
423990 Other Miscellaneous Durable Goods Merchant Wholesalers
424990 Other Miscellaneous Non-durable Goods Merchant Wholesalers
444110 Home Centers
444110 Home Centers
444110 Home Centers
444120 Paint and Wallpaper Stores
444120 Paint and Wallpaper Stores
444120 Paint and Wallpaper Stores
444120 Paint and Wallpaper Stores
444130 Hardware Stores
444130 Hardware Stores
444220 Nursery, Garden Center, and Farm Supply Stores
452111 Department Stores (except Discount Department Stores)
452111 Department Stores (except Discount Department Stores)
452111 Department Stores (except Discount Department Stores)
452111 Department Stores (except Discount Department Stores)
452111 Department Stores (except Discount Department Stores)
452111 Department Stores (except Discount Department Stores)
452990 All Other General Merchandise Stores
452990 All Other General Merchandise Stores
452990 All Other General Merchandise Stores
452990 All Other General Merchandise Stores
452990 All Other General Merchandise Stores
452990 All Other General Merchandise Stores
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452990 All Other General Merchandise Stores
452990 All Other General Merchandise Stores
452990 All Other General Merchandise Stores
452990 All Other General Merchandise Stores
445110 Supermarkets and Other Grocery (except Convenience) Stores
445120 Convenience Stores
447110 Gasoline Stations with Convenience Stores
447110 Gasoline Stations with Convenience Stores
447110 Gasoline Stations with Convenience Stores
445110 Supermarkets and Other Grocery (except Convenience) Stores
447110 Gasoline Stations with Convenience Stores

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447110 Gasoline Stations with Convenience Stores
445110 Supermarkets and Other Grocery (except Convenience) Stores
447110 Gasoline Stations with Convenience Stores
445110 Supermarkets and Other Grocery (except Convenience) Stores
447110 Gasoline Stations with Convenience Stores
447110 Gasoline Stations with Convenience Stores
445292 Confectionery and Nut Stores
311811 Retail Bakeries
445291 Baked Goods Stores
445299 All Other Specialty Food Stores
441310 Automotive Parts and Accessories Stores
441310 Automotive Parts and Accessories Stores
441310 Automotive Parts and Accessories Stores
441320 Tire Dealers
441320 Tire Dealers
441310 Automotive Parts and Accessories Stores
441320 Tire Dealers
441310 Automotive Parts and Accessories Stores
441310 Automotive Parts and Accessories Stores
448110 Men's Clothing Stores
448110 Men's Clothing Stores
448120 Women's Clothing Stores
448120 Women's Clothing Stores
448120 Women's Clothing Stores
448120 Women's Clothing Stores
448120 Women's Clothing Stores
448120 Women's Clothing Stores
448120 Women's Clothing Stores
448120 Women's Clothing Stores
448120 Women's Clothing Stores
448120 Women's Clothing Stores
448120 Women's Clothing Stores
448140 Family Clothing Stores
448140 Family Clothing Stores
448140 Family Clothing Stores
448210 Shoe Stores
448210 Shoe Stores
448210 Shoe Stores
448210 Shoe Stores
448210 Shoe Stores
448210 Shoe Stores
448210 Shoe Stores
448210 Shoe Stores
448210 Shoe Stores
448190 Other Clothing Stores
442110 Furniture Stores
442110 Furniture Stores
442110 Furniture Stores
442110 Furniture Stores
442299 All Other Home Furnishings Stores
443112 Radio, Television, and Other Electronics Stores

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443112 Radio, Television, and Other Electronics Stores
443112 Radio, Television, and Other Electronics Stores
451220 Prerecorded Tape, Compact Disc, and Record Stores
451220 Prerecorded Tape, Compact Disc, and Record Stores
722211 Limited-Service Restaurants
722110 Full-Service Restaurants
722212 Cafeterias, Grill Buffets, and Buffets
722110 Full-Service Restaurants
722110 Full-Service Restaurants
722211 Limited-Service Restaurants
722211 Limited-Service Restaurants
722211 Limited-Service Restaurants
722110 Full-Service Restaurants
722211 Limited-Service Restaurants
722211 Limited-Service Restaurants
722211 Limited-Service Restaurants
722211 Limited-Service Restaurants
722211 Limited-Service Restaurants
722211 Limited-Service Restaurants
722110 Full-Service Restaurants
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722110 Full-Service Restaurants
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722211 Limited-Service Restaurants
722211 Limited-Service Restaurants
722211 Limited-Service Restaurants
722211 Limited-Service Restaurants
722211 Limited-Service Restaurants
722211 Limited-Service Restaurants
722211 Limited-Service Restaurants
722110 Full-Service Restaurants
446110 Pharmacies and Drug Stores
446110 Pharmacies and Drug Stores
446110 Pharmacies and Drug Stores
446110 Pharmacies and Drug Stores
445310 Beer, Wine, and Liquor Stores
445310 Beer, Wine, and Liquor Stores
445310 Beer, Wine, and Liquor Stores
445310 Beer, Wine, and Liquor Stores
453310 Used Merchandise Stores
453310 Used Merchandise Stores
453310 Used Merchandise Stores
522298 All Other Non-depository Credit Intermediation
453310 Used Merchandise Stores
451110 Sporting Goods Stores
451110 Sporting Goods Stores
451110 Sporting Goods Stores
451211 Book Stores
451211 Book Stores
451211 Book Stores

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451211 Book Stores
451211 Book Stores
453210 Office Supplies and Stationery Stores
453210 Office Supplies and Stationery Stores
453210 Office Supplies and Stationery Stores
448310 Jewelry Stores
448310 Jewelry Stores
448310 Jewelry Stores
448310 Jewelry Stores
448310 Jewelry Stores
448310 Jewelry Stores
451120 Hobby, Toy, and Game Stores
451120 Hobby, Toy, and Game Stores
453220 Gift, Novelty, and Souvenir Stores
448320 Luggage and Leather Goods Stores
451130 Sewing, Needlework, and Piece Goods Stores
451130 Sewing, Needlework, and Piece Goods Stores
446130 Optical Goods Stores
446130 Optical Goods Stores
446130 Optical Goods Stores
446130 Optical Goods Stores
446130 Optical Goods Stores
453920 Art Dealers
446120 Cosmetics, Beauty Supplies, and Perfume Stores
446120 Cosmetics, Beauty Supplies, and Perfume Stores
453910 Pet and Pet Supplies Stores
444220 Nursery, Garden Center, and Farm Supply Stores
446120 Cosmetics, Beauty Supplies, and Perfume Stores
522110 Commercial Banking
523210 Securities and Commodity Exchanges
721110 Hotels (except Casino Hotels) and Motels
812320 Dry cleaning and Laundry Services (except Coin-Operated)
812331 Linen Supply
812199 Other Personal Care Services
532310 General Rental Centers
532310 General Rental Centers
532310 General Rental Centers
532310 General Rental Centers
532310 General Rental Centers
518210 Data Processing, Hosting, and Related Services
532420 Office Machinery and Equipment Rental and Leasing
512240 Sound Recording Studios
561499 All Other Business Support Services
541380 Testing Laboratories
532120 Truck, Utility Trailer, and RV (Recreational Vehicle) Rental and Leasing
532112 Passenger Car Leasing
811113 Automotive Transmission Repair
811198 All Other Automotive Repair and Maintenance

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811191 Automotive Oil Change and Lubrication Shops
811198 All Other Automotive Repair and Maintenance
811191 Automotive Oil Change and Lubrication Shops
811191 Automotive Oil Change and Lubrication Shops
561622 Locksmiths
532230 Video Tape and Disc Rental
532230 Video Tape and Disc Rental
532230 Video Tape and Disc Rental
713990 All Other Amusement and Recreation Industries
713990 All Other Amusement and Recreation Industries
621512 Diagnostic Imaging Centers
624410 Child Day Care Services
624410 Child Day Care Services
624410 Child Day Care Services
424910 Farm Supplies Merchant Wholesalers

Appendix F. Reappraisal Plan From Third Party Vendor



S.B. 1652* BIENNIAL REAPPRAISAL PLAN

**FOR THE ANNUAL APPRAISAL FOR
AD VALOREM TAX PURPOSES OF
MINERAL, INDUSTRIAL, UTILITY AND
RELATED PERSONAL PROPERTY**

For Tax Years:

2019 and 2020

Originally Printed: June 13, 2018

*Senate Bill 1652 passed by the Texas Legislature, 79th Regular Session in 2005, amending Section 6.05 of the Texas Property Tax Code, adding Subsection (i) as follows:

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



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POLICY STATEMENT OF PRITCHARD & ABBOTT, INC., ON THE UNIFORM STANDARDS OF PROFESSIONAL APPRAISAL PRACTICE

Pritchard & Abbott, Inc., (P&A), a privately held company engaged primarily, but not wholly, in the ad valorem tax valuation industry endorses Uniform Standards of Professional Appraisal Practice (USPAP) as the basis for the production of sound appraisals. Insofar as the statutory requirement to appraise groups (or a “universe”) of real and personal property within an established period of time using standardized procedures—and subjecting the resulting appraisals to statistical measures—is the definition of mass appraisal, P&A subscribes to USPAP Standards 5 and 6 (Mass Appraisal, Development and Reporting) whenever applicable in the development and defense of values. When circumstances clearly dictate the use of single property appraisal procedures, P&A adheres to the spirit and intent of the remaining USPAP Standards within all appropriate, practical, and/or contractual limitations or specifications.

The USPAP definition of “appraiser” is one who is expected to perform valuation services competently and in a manner that is independent, impartial, and objective. USPAP Advisory Opinion 21 states that this expectation (by clients and intended users of appraisal reports) is the basis that creates an ethical obligation to comply with USPAP, even if not legally required.

The majority of property types that P&A typically appraises for ad valorem tax purposes are categorized as unique, complex, and/or “special purpose” properties (mineral interests, industrial, utility, and related personal property). These categories of properties do not normally provide sufficient market data of reliable quality and/or quantity to support the rigorous use of all USPAP-prescribed mass appraisal development mandates (Standard 5: Mass Appraisal, Development), particularly with regards to some, but not all, of the *model calibration* and *statistical performance testing* confines. However, P&A does strive to employ all or most elements of mass appraisal techniques with regards to the *definition* and *identification of property characteristics* and *model specification* and application.

Residential real estate property appraisers most frequently apply mass appraisal methods within the sales comparison (market) approach to value. Through the use of standardized data collection (i.e., actual market sales), specification and calibration of mass appraisal models, tables, and schedules are possible. Through ratio study analysis and other performance measures, a cumulative summary of valuation accuracy can thus be produced in order to calibrate the appraisal model(s). Where sufficient data of reliable quality exists, mass appraisal is also used for other types of real estate property such as farms, vacant lots, and some commercial uses (e.g., apartments, offices, and small retail).

Regarding mass appraisal reports due the client and other intended users per USPAP (Standard 6 (Mass Appraisal, Reporting), P&A will clearly state or otherwise make known all extraordinary assumptions, hypothetical conditions, limitations imposed by assignment conditions, and/or jurisdictional exceptions in its appraisal reports as they are conveyed to our clients. **Intended users of our reports are typically the client(s) for which we are under direct contract.** Although taxpayers or their agents who own and/or represent the subject property being appraised often receive these reports either by law or as a courtesy of the client or P&A, this receipt does not mean these parties automatically become Intended Users as defined by USPAP. **A party receiving a copy of a report in order to satisfy disclosure requirements does not become an intended user of the appraisal or mass appraisal unless the appraiser specifically identifies such party as an intended user.** Potential other users include parties involved in adjudication of valuation disputes (review board members, lawyers, judges, etc.), governmental agencies which periodically review our appraisals for various statutory purposes (such as the Texas Comptroller’s Office) and private parties who may obtain copies of our appraisals through Open Records Requests made to governmental agencies.

USPAP does not currently address communications of assignment results prior to completion of the assignment, thus such communications have no requirements other than to comply with the general requirements in the ETHICS RULE, the COMPETENCY RULE, and the JURISDICTIONAL EXCEPTION RULE. The client and all intended users should be aware that mass appraisals, as opposed to most “fee” appraisals, are somewhat inherently “limited” versus “complete” and that appraisal reports, unless otherwise contracted for by the client, will most often be of a “restricted” nature whereas explanations of appraisal methods and results are more concise versus lengthy in order to promote brevity, clarity, and transparency to the intended user(s).

Per USPAP, the appropriate reporting option and level of information in a report are dependant on the intended use and the

intended users. Although the reporting verbiage in USPAP Standard 6 does not specifically offer or promulgate a “Restricted Appraisal Report” such as in Standard 2 (Real Property Appraisal, Reporting) and Standard 8 (Personal Property Appraisal, Reporting), it should be noted that: a) all mass appraisals and mass appraisal reports deal with real and personal property in some form or fashion; and b) P&A is a private consulting firm, a fact which may necessitate the withholding of certain data and/or appraisal models/techniques which are deemed confidential, privileged and/or proprietary in nature. *The use of “limited” appraisals in conjunction with “restricted” reports in no way implies non-compliance with USPAP.* The substantive content of a report determines its compliance.

P&A believes that, with its vast experience and expertise in these areas of appraisal, all concluded values and reports thereof are credible, competent, understandable, uniform and consistent; and most importantly for ad valorem tax purposes, accomplished in a cost-efficient and timely manner.

Per previous ASB comments under Standard 6-2(b) [*scope of work... special limiting conditions*]:

“Although appraisers in ad valorem taxation should not be held accountable for limitations beyond their control, they are required by this specific requirement to identify cost constraints and to take appropriate steps to secure sufficient funding to produce appraisals that comply with these standards. Expenditure levels for assessment administration are a function of a number of factors. Fiscal constraints may impact data completeness and accuracy, valuation methods, and valuation accuracy. Although appraisers should seek adequate funding and disclose the impact of fiscal constraints on the mass appraisal process, they are not responsible for constraints beyond their control.”

In any event, however, it is not P&A’s intent to allow constraints, fiscal or otherwise, to limit the scope of work to such a degree that the mass appraisal results provided to our clients are not credible within the context of the intended use(s) of the appraisal.

PREAMBLE

The purpose of USPAP is to establish requirements and conditions for ethical, thorough, and transparent property valuation services. Valuation services pertain to all aspects of property value and include services performed by appraisers and other professionals including attorneys, accountants, insurance estimators, auctioneers, or brokers. Valuation services include appraisal, appraisal review, and appraisal consulting. The primary intent of these Standards is to promote and maintain a high level of public trust in professional appraisal practice.

It is essential that professional appraisers develop and communicate their analyses, opinions, and conclusions to intended users of their services in a manner that is meaningful and not misleading. The importance of the role of the appraiser places ethical obligations upon those who serve in this capacity. These USPAP Standards reflect the current standards of the appraisal profession.

These Standards are for both appraisers and users of appraisal services. To maintain a high level of professional practice, appraisers observe these Standards. However, these Standards do not in themselves establish which individuals or assignments must comply. The Appraisal Foundation nor its Appraisal Standards Board is not a government entity with the power to make, judge, or enforce law. Compliance with USPAP is only required when either the service or the appraiser is obligated to comply by law or regulation, or by agreement with the client or intended users. When not obligated, individuals may still choose to comply.

USPAP addresses the ethical and performance obligations of appraisers through DEFINITIONS, Rules, Standards, Standards Rules, and Statements (if any). USPAP Standards deal with the procedures to be followed in performing an appraisal or appraisal review and the manner in which each is communicated. A brief description of the USPAP Standards are as follows:

- **Standards Rules 1 and 2:** establish requirements for the development and communication of a real property appraisal.
- **Standards Rules 3 and 4:** establishes requirements for the development and communication of an appraisal review.
- **Standards Rules 5 and 6:** establishes requirements for the development and communication of a mass appraisal.
- **Standards Rules 7 and 8:** establish requirements for the development and communication of a personal property appraisal.
- **Standards Rules 9 and 10:** establish requirements for the development and communication of a business or intangible asset appraisal.

Section 23.01(b) [*Appraisals Generally*] of the Texas Property Tax Code states:

“The market value of property shall be determined by the application of generally accepted appraisal methods and techniques. If the Appraisal District determines the appraised value of a property using mass appraisal standards, the mass appraisal standards must comply with the Uniform Standards of Professional Appraisal Practice...” (underline added for emphasis)

Consequently, USPAP Standards Rules 5 and 6 are assumed to be the applicable standard for ad valorem tax purposes in Texas, if mass appraisal practices are in fact being used to appraise the subject property. USPAP Advisory Opinion 32 suggests several USPAP standards other than Standards 5 or 6 can or should apply in ad valorem tax work. However, it appears that an appraiser engaged in ad valorem tax work in Texas is not specifically required by law to follow these USPAP standards if in fact mass appraisal practices have not been used to appraise the subject property. In this case it could be deemed appropriate to invoke the Jurisdictional Exception Rule which is applicable when there is a contradiction between the requirements of USPAP and the law or regulation of a jurisdiction. Please see the P&A Policy Statement on USPAP as provided elsewhere in this report for a more detailed discussion regarding this matter.

ETHICS RULE

Because of the fiduciary responsibilities inherent in professional appraisal practice, the appraiser must observe the highest standards of professional ethics. This Ethics Rule is divided into three sections:

- Conduct;
- Management;
- Confidentiality.

This Rule emphasizes the personal obligations and responsibilities of the individual appraiser. However, it should be noted that groups and organizations *which are comprised of individual appraisers engaged in appraisal practice* effectively share the same ethical obligations. To the extent the group or organization does not follow USPAP Standards when legally required, individual appraisers should take steps that are appropriate under the circumstances to ensure compliance with USPAP.

Compliance with these Standards is required when either the service or the appraiser is obligated by law or regulation, or by agreement with the client or intended users, to comply. Compliance is also required when an individual, by choice, represents that he or she is performing the service as an appraiser.

An appraiser must not misrepresent his or her role when providing valuation services that are outside of appraisal practice.

Honesty, impartiality, and professional competency are required of all appraisers under USPAP Standards. To document recognition and acceptance of his or her USPAP-related responsibilities in communicating an appraisal or appraisal review completed under USPAP, an appraiser is required to certify compliance with these Standards.

CONDUCT

An appraiser must perform assignments with impartiality, objectivity, and independence, and without accommodation of personal interests.

An appraiser:

- must not perform an assignment with bias;
- must not advocate the cause or interest of any party or issue;
- must not accept an assignment that includes the reporting of predetermined opinions and conclusions;
- must not misrepresent his or her role when providing valuation services that are outside of appraisal practice;
- must not communicate assignment results with the intent to mislead or to defraud;
- must not use or communicate a report or assignment results known by the appraiser to be misleading or fraudulent;
- must not knowingly permit an employee or other person to communicate a report or assignment results that are misleading or fraudulent report;
- must not use or rely on unsupported conclusions relating to characteristics such as race, color, religion, national origin, gender, marital status, familial status, age, receipt of public assistance income, handicap, or an unsupported conclusion that homogeneity of such characteristics is necessary to maximize value;
- must not engage in criminal conduct;
- must not willfully or knowingly violate the requirements of the RECORD KEEPING RULE; and must not perform an assignment in a grossly negligent manner.

If known prior to accepting an assignment, and/or if discovered at any time during the assignment, an appraiser must disclose to the client, and in each subsequent report certification:

- any current or prospective interest in the subject property or parties involved; and
- any services regarding the subject property performed by the appraiser within the three year period immediately preceding acceptance of the assignment, as an appraiser or in any other capacity.

The appraiser can agree with the client to keep the mere occurrence of a prior appraisal assignment confidential. If an appraiser has agreed with the client not to disclose that he or she has appraised a property, the appraiser must decline all subsequent assignment that fall with the three year period. In assignments is which there is no report, only the initial disclosure to the client is required.

Presumably all parties in ad valorem tax appraisal will be aware of the ongoing yearly nature of the appraisal assignments performed by valuation consulting firms like Pritchard & Abbott, Inc. — i.e., it will not be confidential — so that this particular conduct instruction is more or less a moot point (regarding the three year period discussed) if the prior service is in fact the ad valorem tax appraisals performed in previous tax years.

MANAGEMENT

The payment of a fee, commission, or a thing of value by the appraiser in connection with the procurement of an assignment must be disclosed. This disclosure must appear in the certification and in any transmittal letter in which conclusions of value are stated; however, the disclosure of the amount paid is not required. Intra-company payments to employees of groups or organizations involved in appraisal practice for business development do not require disclosure.

It is unethical for an appraiser to accept compensation for performing an assignment when it is contingent upon the reporting of a predetermined result, a direction in assignment results that favors the cause of the client, the amount of a value opinion, the attainment of a stipulated result, or the occurrence of a subsequent event directly related to the appraiser's opinions and specific to the assignment's purpose.

Advertising for or soliciting assignments in a manner that is false, misleading, or exaggerated is unethical. Decisions regarding finder or referral fees, contingent compensation, and advertising may not be the responsibility of an individual appraiser, but for a particular assignment it is the responsibility of the individual appraiser to ascertain that there has been no breach of ethics, that the assignment consulting assignment has been prepared in accordance with USPAP Standards, and that the report can be properly certified when required by USPAP Standards Rules 2-3, 3-3, 5-3, 6-9, 8-3, or 10-3.

An appraiser must affix, or authorize the use of, his or her signature to certify recognition and acceptance of his or her USPAP responsibilities in an appraisal or appraisal review assignment. An appraiser may authorize the use of his or her signature only on an assignment-by-assignment basis.

In addition, an appraiser must not affix the signature of another appraiser without his or her consent. An appraiser must exercise due care to prevent unauthorized use of his or her signature. However, an appraiser exercising such care is not responsible for unauthorized use of his or her signature.

CONFIDENTIALITY

An appraiser must protect the confidential nature of the appraiser-property owner relationship.

An appraiser must act in good faith with regard to the legitimate interests of the client in the use of confidential information and in the communication of assignment results.

An appraiser must be aware of, and comply with, all confidentiality and privacy laws and regulations applicable in an assignment.

An appraiser must not disclose confidential factual data obtained from a property owner to anyone other than:

1. The client;
2. Parties specifically authorized by the client;
3. State appraiser regulatory agencies;
4. Third parties as may be authorized by due process of law; or
5. A duly authorized professional peer review committee except when such disclosure to a committee would violate

applicable law or regulation.

An appraiser must take reasonable steps to safeguard access to confidential information and assignment results by unauthorized individuals, whether such information or results are in physical or electronic form. In addition, an appraiser must ensure that employees, co-workers, sub-contractors, or others who may have access to confidential information or assignments results, are aware of the prohibitions on disclosure of such information or results.

It is unethical for a member of a duly authorized professional peer review committee to disclose confidential information presented to the committee.

When all confidential elements of confidential information are removed through redaction or the process of aggregation, client authorization is not required for the disclosure of the remaining information, as modified.

RECORD KEEPING RULE

An appraiser must prepare a workfile for each appraisal or appraisal review assignment. A workfile must be in existence prior to the issuance of any report or other communication of assignment results. A written summary of an oral report must be added to the workfile within a reasonable time after the issuance of the oral report.

The workfile must include the name of the client and the identity, by name or type, of any other intended users, and true copies of all written reports, documented on any type of media. (A true copy is a replica of the report transmitted to the client. A photocopy or an electronic copy of the entire report transmitted to the client satisfies the requirement of a true copy.) A workfile must contain summaries of all oral reports or testimony, or a transcript of testimony, including the appraiser's signed and dated certification; and all other data, information, and documentation necessary to support the appraiser's opinions and conclusions and to show compliance with USPAP, or references to the location(s) of such other data, information, and documentation.

A workfile in support of a Restricted Appraisal Report or an oral appraisal report must be sufficient for the appraiser to produce an Appraisal Report. A workfile in support of an oral appraisal review report must be sufficient for the appraiser to produce an Appraisal Review Report.

An appraiser must retain the workfile for a period of at least five years after preparation or at least two years after final disposition of any judicial proceeding in which the appraiser provided testimony related to the assignment, whichever period expires last.

An appraiser must have custody of the workfile, or make appropriate workfile retention, access, and retrieval arrangements with the party having custody of the workfile. This includes ensuring that a workfile is stored in a medium that is retrievable by the appraiser throughout the prescribed record retention period. An appraiser having custody of a workfile must allow other appraisers with workfile obligations related to an assignment appropriate access and retrieval for the purpose of:

- submission to state appraiser regulatory agencies;
- compliance with due process of law;
- submission to a duly authorized professional peer review committee; or
- compliance with retrieval arrangements.

A workfile must be made available by the appraiser when required by a state appraiser regulatory agency or due process of law.

An appraiser who willfully or knowingly fails to comply with the obligations of this Record Keeping Rule is in violation of the Ethics Rule.

SCOPE OF WORK RULE

For each appraisal or appraisal review assignment, an appraiser must:

1. Identify the problem to be solved;
2. Determine and perform the scope of work necessary to develop credible assignment results; and
3. Disclose the scope of work in the report.

An appraiser must properly identify the problem to be solved in order to determine the appropriate scope of work. The appraiser must be prepared to demonstrate that the scope of work is sufficient to produce credible assignment results.

Scope of work includes, but is not limited to:

- the extent to which the property is identified;
- the extent to which tangible property is inspected;
- the type and extent of data researched; and
- the type and extent of analyses applied to arrive at opinions or conclusions.

Appraisers have broad flexibility and significant responsibility in determining the appropriate scope of work for an appraisal or appraisal review assignment. Credible assignment results require support by relevant evidence and logic. The credibility of assignment results is always measured in the context of the intended use.

PROBLEM IDENTIFICATION

An appraiser must gather and analyze information about those assignment elements that are necessary to properly identify the appraisal, appraisal review or appraisal consulting problem to be solved. The assignment elements necessary for problem identification are addressed in the Standards Rule 6-2:

- client and any other intended users;
- intended use of the appraiser's opinions and conclusions;
- type and definition of value;
- effective date of the appraiser's opinions and conclusions;
- subject of the assignment and its relevant characteristics; and
- assignment conditions.

This information provides the appraiser with the basis for determining the type and extent of research and analyses to include in the development of an appraisal. Similar information is necessary for problem identification in appraisal review and appraisal consulting assignments. Assignment conditions include:

- assumptions;
- extraordinary assumptions;
- hypothetical conditions;
- laws and regulations;
- jurisdictional exceptions; and
- other conditions that affect the scope of work.

SCOPE OF WORK ACCEPTABILITY

The scope of work must include the research and analyses that are necessary to develop credible assignment results. The scope of work is acceptable when it meets or exceeds:

- the expectations of parties who are regularly intended users for similar assignments; and
- what an appraiser's peers' actions would be in performing the same or a similar assignment.

Determining the scope of work is an ongoing process in an assignment. Information or conditions discovered during the course of an assignment might cause the appraiser to reconsider the scope of work. An appraiser must be prepared to support the decision to exclude any investigation, information, method, or technique that would appear relevant to the client, another intended user, or the appraiser's peers.

An appraiser must not allow assignment conditions to limit the scope of work to such a degree that the assignment results are not credible in the context of the intended use. In addition, the appraiser must not allow the intended use of an assignment or a client's objectives to cause the assignment results to be biased.

DISCLOSURE OBLIGATIONS

The report must contain sufficient information to allow intended users to understand the scope of work performed. Proper disclosure is required because clients and other intended users may rely on the assignment results. Sufficient information includes disclosure of research and analyses performed or not performed.

JURISDICTIONAL EXCEPTION RULE

If any applicable law or regulation precludes compliance with any part of USPAP, only that part of USPAP becomes void for that assignment. When compliance with USPAP is required by federal law or regulation, no part of USPAP can be voided by a law or regulation of a state or local jurisdiction. *When an appraiser properly follows this Rule in disregarding a part of USPAP, there is no violation of USPAP.*

In an assignment involving a jurisdictional exception, an appraiser must:

- identify the law or regulation that precludes compliance with USPAP;
- comply with that law or regulation;
- clearly and conspicuously disclose in the report the part of USPAP that is voided by that law or regulation; and
- cite in the report the law or regulation requiring this exception to USPAP compliance.

The purpose of the Jurisdictional Exception Rule is strictly limited to providing a saving or severability clause intended to preserve the balance of USPAP if one or more of its parts are determined as contrary to law or public policy of a jurisdiction. By logical extension, there can be no violation of USPAP by an appraiser who disregards, with proper disclosure, only the part or parts of USPAP that are void and of no force and effect in a particular assignment by operation of legal authority.

It is misleading for an appraiser to disregard a part or parts of USPAP as void and of no force and effect in a particular assignment without identifying the part or parts disregarded and the legal authority justifying this action in the appraiser's report.

“Law” includes constitutions, legislative and court-made law, and administrative rules (such as from the Office of the Texas Comptroller of Public Accounts) and ordinances. “Regulations” include rules or orders having legal force, issued by an administrative agency. Instructions from a client or attorney do not establish a jurisdictional exception.

A jurisdictional exception prevalent in Texas is that appraisers are seeking to establish “fair market value” as defined by the Texas Property Tax Code instead of “market value” as found in the USPAP definitions section.

USPAP STANDARDS 5 AND 6: MASS APPRAISAL, DEVELOPMENT AND REPORTING (General Discussion)

In developing a mass appraisal, an appraiser must be aware of, understand, and correctly employ those recognized methods and techniques necessary to produce and communicate credible mass appraisals.

Standards 5 and 6 apply to all mass appraisals of real and personal property regardless of the purpose or use of such appraisals. It is directed toward the substantive aspects of developing and communicating competent analyses, opinions, and conclusions in the mass appraisal of properties, whether real property or personal property. Standard 5 is directed toward the substantive aspects of developing credible analyses, opinions, and conclusions in the mass appraisal of properties, while Standard 6 addresses the content and level of information required in a report that communicates the results of a mass appraisal. The reporting and jurisdictional exceptions applicable to public mass appraisals prepared for purposes of ad valorem taxation do not apply to mass appraisals prepared for other purposes.

A mass appraisal includes:

- identifying properties to be appraised;
- defining market areas of consistent behavior that applies to properties;
- identifying characteristics (supply and demand) that affect the creation of value in that market area;
- developing (specifying) a model structure that reflects the relationship among the characteristics affecting value in the market area;
- calibrating the model structure to determine the contribution of the individual characteristics affecting value;
- applying the conclusions reflected in the model to the characteristics of the properties being appraised; and
- reviewing the mass appraisal results.

The Jurisdictional Exception Rule may apply to several sections of Standards 5 and 6 because ad valorem tax administration is subject to various state, county, and municipal laws.

As previously stated in the P&A Policy Statement (page 2), it may not be possible or practicable for all the mass appraisal attributes listed above to be rigorously applied to the many types of complex and/or unique properties that P&A typically appraises. Often there are contractual limitations on the scope of work needed or required. More prevalently, these types of properties do not normally provide a reliable database of market transactions (or details of transactions) necessary for statistically supportable calibration of appraisal models and review of appraisal results. Generally these two functions are effectively accomplished through annual extended review meetings with taxpayers (and clients) who provide data, sometimes confidentially, that allows for appraisal models to be adjusted where necessary. Nevertheless, and notwithstanding whether P&A implicitly or explicitly employs or reports all attributes listed above, in all cases P&A at the minimum employs tenants of “generally accepted appraisal methods” which are the genesis of USPAP Standards.

Per USPAP guidelines, P&A will make known all departures and jurisdictional exceptions when invoked (if an appraisal method or specific requirement is applicable but not necessary to attain credible results in a particular assignment).

The various sections of Standard 5 (development of mass appraisal) and Standard 6 (communication of the mass appraisal results) are briefly summarized below:

- **Standard 5-1:** Establishes the appraiser’s technical and ethical framework. Specifically, appraisers must recognize and use established principles, methods and techniques of appraisal in a careful manner while not committing substantial errors of fact or negligence that would materially affect the appraisal results and not give a credible estimate of fair market value. To this end appraisers must continuously improve his or her skills to maintain proficiency and keep abreast of any new developments in the real and personal property appraisal profession. This Standards Rule does not imply that competence requires perfection, as perfection is impossible to attain. Instead, it requires appraisers to employ every reasonable effort with regards to due diligence and due care.

- **Standard 5-2:** Defines the introductory framework requirements of developing a mass appraisal, focusing on the identification and/or definition of: client(s), intended users, effective date, appraisal perspective, scope of work, extraordinary assumptions, hypothetical conditions, the type and definition of value being developed (typically “fair market value” for ad valorem tax purposes), characteristics of the property being appraised in relation to the type and definition of value and intended use, the characteristics of the property’s market, the property’s real or personal attributes, fractional interest applicability, highest and best use analysis along with other land-related considerations, and any other economic considerations relevant to the property.
- **Standard 5-3:** Defines requirements for developing and specifying appropriate mass appraisal data and elements applicable for real and personal property. For real property, the data and elements include: existing land use regulations, reasonably probable modification of such regulations, economic supply and demand, the physical adaptability of the real estate, neighborhood trends, and highest and best use analysis. For personal property, the relevant data and elements include: identification of industry trends, trade level, highest and best use, and recognition of the appropriate market consistent with the type and definition of value.
- **Standard 5-4:** Further defines requirements for developing mass appraisal models, focusing on development of standardized data collection forms, procedures, and training materials that are used uniformly on the universe of properties under consideration. This rule specifies that appraisers employ recognized techniques for specifying and calibrating mass appraisal models. Model specification is the formal development of a model in a statement or mathematical equation, including all due considerations for physical, functional, and external market factors as they may affect the appraisal. These models must accurately represent the relationship between property value and supply and demand factors, as represented by quantitative and qualitative property characteristics. Models must be calibrated using recognized techniques, including, but not limited to, multiple linear regression, nonlinear regression, and adaptive estimation. Models may be specified incorporating the income, market, and/or cost approaches to value and may be tabular, mathematical, linear, nonlinear, or any other structure suitable for representing the observable property characteristics such as adaptive estimation. Model calibration refers to the process of analyzing sets of property and market data to determine the specific parameters of a model.
- **Standard 5-5:** Defines requirements for collection of sufficient factual data, in both qualitative and quantitative terms, necessary to produce credible appraisal results. The property characteristics collected must be contemporaneous with the effective date of the appraisal. The data collection program should incorporate a quality control procedure, including checks and audits of the data to ensure current and consistent records. This rule also calls for calls for an appraiser, in developing income and expense statements and cashflow projections, to weigh historical information and trends, current market factors affecting such trends, and reasonably anticipated events, such as competition from developments either planned or under construction. Terms and conditions of any leases should be analyzed, as well as the need for and extent of any physical inspection of the properties being appraised.
- **Standard 5-6:** Defines requirements for application of a calibrated model to the property being appraised. This rule calls for: the appraiser to recognize methods or techniques based on the cost, market, and income approaches for improved parcels; the appraiser to value sites by recognized methods or techniques such as allocation method, abstraction method, capitalization of ground rent, and land residual; the appraiser to develop value of leased fee or leasehold estates with consideration for terms and conditions of existing leases, and, when applicable by law, as if held in fee simple whereas market rents are substituted for actual contract rents; the appraiser to analyze the effect on value, if any, of the assemblage of the various parcels, divided interests, or component parts of a property; the appraiser to analyze anticipated public or private improvements located on or off the site, and analyze the effect on value, if any, of such anticipated improvements to the extent they are reflected in market actions.
- **Standard 5-7:** Defines the reconciliation process of a mass appraisal. Specifically, appraisers must analyze the results and/or applicability of the various approaches used while ensuring that, on an overall basis, standards of reasonableness and accuracy are maintained with the appraisal model selected (underline added for emphasis). It is implicit in mass appraisal that, even when properly specified and calibrated models are used, some individual value conclusions will not meet standards of reasonableness, consistency, and accuracy. Appraisers have a professional responsibility to ensure that, on an overall basis, models produce value conclusions that meet attainable standards of accuracy.

- **Standard 6-1:** Defines requirements of a mass appraisal written report by addressing the content and level of information required in a report that communicates the results of a mass appraisal (elements of which are further detailed in the next three sections of this report that discuss P&A appraisal procedures with regards to specific categories of property).
- **Standard 6-2:** Defines requirements for appraiser certification of the mass appraisal written report.

The following sections of this report discuss in detail the various elements of the mass appraisal written report as required by USPAP Standard 6-1, with regards to P&A appraisal of Mineral Interests, Industrial-Utility-Personal Property, and Real Estate.

USPAP STANDARDS RULE 6-1: MASS APPRAISAL OF MINERAL INTERESTS

Note: This section, in conjunction with any attached or separately provided P&A-generated appraisal reports specific to the subject property or properties, constitutes the “mass appraisal written report” as required by USPAP Standards Rule 6-1. USPAP Standards Rule 6-2 (certification) can be found at the end of this report. USPAP Standards Rules 5-1 through 5-7 (instructions and explanations regarding the development, application, and reconciliation of mass appraisal values), as they apply to P&A mass appraisal procedures, are discussed below. USPAP DOES NOT DICTATE THE FORM, FORMAT, OR STYLE OF APPRAISAL REPORTS, WHICH ARE FUNCTIONS OF THE NEEDS OF USERS AND PROVIDERS OF APPRAISAL SERVICES. USPAP ALSO DOES NOT MANDATE THAT EACH APPRAISAL REPORT BE LENGTHY AND FULL OF DISCLAIMERS. Readers should note that all P&A reports, unless stated otherwise, are of a “restricted” nature whereas additional documentation and detail may be available per certain Texas Property Tax Code provisions.

INTRODUCTION

Definition of Appraisal Responsibility (Scope of Effort): The Mineral Valuation Department of Pritchard & Abbott, Inc. (“P&A” hereinafter), is responsible for developing credible values for mineral interests (full or fractional percentage ownership of oil and gas leasehold interest, the amount and type of which are legally and/or contractually created and specified through deeds and leases, et.al.) associated with producing (or capable of producing) leases. Mineral interests are typically considered real property because of their derivation from the bundle of rights associated with original fee simple ownership of land. Typically all the mineral interests that apply to a single producing lease are consolidated by type (working vs. royalty) with each type then appraised for full value which is then distributed to the various fractional decimal interest owners prorata to their individual type and percentage amount.

P&A’s typical client is a governmental entity charged with appraisal responsibility for ad valorem tax purposes, although other types of clients (private businesses, individuals, etc.) occasionally contract for appraisal services which are strictly for various non-ad valorem tax purposes so that no conflicts of interest are created with P&A’s core ad valorem tax work.

P&A hereby makes the assumption that, in all appraisal assignments performed for governmental entities in satisfaction of contractual obligations related to ad valorem tax, the client does not wish to or cannot legally request the appraisal report not identify the client.

Intended users of our reports are typically the client(s) for which we are under direct contract. Although taxpayers or their agents who own and/or represent the subject property being appraised often receive these reports either by law or as a courtesy of the client or P&A, this receipt does not mean these parties automatically become Intended Users as defined by USPAP. **A party receiving a copy of a report in order to satisfy disclosure requirements does not become an intended user of the appraisal or mass appraisal unless the appraiser specifically identifies such party as an intended user.** Potential other users include parties involved in adjudication of valuation disputes (review board members, lawyers, judges, etc.), governmental agencies which periodically review our appraisals for various statutory purposes (such as the Texas Comptroller’s Office) and private parties who may obtain copies of our appraisals through Open Records Requests made to governmental agencies.

This section of P&A’s USPAP report is not applicable to any mineral or mineral interest property that an appraisal district appraises outside of P&A’s appraisal services, in which case the appraisal district’s overall USPAP report should be referenced.

P&A makes the **Extraordinary Assumption** that all properties appraised for ad valorem tax purposes are marketable whereas ownership and title to property are free of encumbrances and other restrictions that would affect fair market value to an extent not obvious to the general marketplace. If and/or when we are made aware of any encumbrances, etc., these would be taken into account in our appraisal in which case the extraordinary assumption stated above would be revoked.

P&A is typically under contract to determine current market value or “fair market value” of said mineral interests. Fair market value is typically described as the price at which a property would sell for if:

- exposed in the open market with a reasonable time for the seller to find a purchaser;
- both the buyer and seller know of all the uses and purposes to which the property is, or can be, adapted and of the enforceable restrictions on its use; and
- both the buyer and seller seek to maximize their gains and neither is in a position to take advantage of the exigencies of the other. [Exigencies are pressing or urgent conditions that leave one party at a disadvantage to the other.]

For ad valorem tax purposes the effective date is usually legislatively specified by the particular State in which we are working - for example, in Texas the lien date is January 1 per the Texas Property Tax Code. For ad valorem tax purposes, the date of the appraisals and reports are typically several months past the effective date, thereby leaving open the possibility that a retrospective approach is appropriate under limited and prescribed circumstances (information after the effective date being applicable only if it confirms a trend or other appraisal condition that existed and was generally known as of the effective date).

P&A believes this section of this report, in conjunction with any attached or separately provided P&A-generated report(s), meets the USPAP definition of “typical practice”; i.e., it satisfies a level of work that is consistent with:

- the expectations of participants in the market for the same or similar appraisal services; and
- what P&A’s peers’ actions would be in performing the same or similar appraisal services in compliance with USPAP.

Legal and Statutory Requirements: In Texas, the provisions of the Texas Property Tax Code and other relevant legislative measures involving appraisal administration and procedures control the work of P&A as an extension of the Appraisal District. Other states in which P&A is employed will have similar controlling legislation, regulatory agencies, and governmental entities. P&A is responsible for appraising property on the basis of its fair market value as of the stated effective date (January 1 in Texas) for ad valorem tax purposes for each taxing unit that imposes ad valorem taxes on property in the contracted Appraisal District. All mineral properties (interests) are reappraised annually. The definition of Fair Market Value is provided and promulgated for use in ad valorem tax work in Texas by the Texas Property Tax Code, and therefore as a **Jurisdictional Exception** supercedes the definition of “market value” as found in USPAP definitions.

NOTE: IN TEXAS, P&A BELIEVES THE PROPERTY BEING APPRAISED AND PLACED ON THE TAX ROLL IS THE INTEREST AND NOT THE OIL OR GAS MINERAL ITSELF, PER PROPERTY TAX CODE SECTION 1.04(2)(F). WHILE OIL AND GAS RESERVES CERTAINLY HAVE VALUE, THE FACT IS THAT IT IS THE INTERESTS IN THESE MINERALS THAT ARE BOUGHT AND SOLD, NOT THE MINERALS THEMSELVES. THE SALE OF MINERALS AS THEY ARE EXTRACTED FROM THE SUBSURFACE OF THE LAND WHERE THEY RESIDE AS MINERALS IN PLACE “MONETIZES” THE INTEREST AND THUS GIVES THE INTEREST ITS VALUE. WHENEVER P&A REFERS TO “MINERAL PROPERTIES” IN THIS REPORT OR IN ANY OTHER SETTING, IT IS THE MINERAL INTEREST, AND NOT THE MINERAL ITSELF, THAT IS THE SUBJECT OF THE REFERENCE.

Administrative Requirements: P&A endorses the principals of the International Association of Assessing Officers (IAAO) regarding its appraisal practices and procedures. P&A also endorses, and follows when possible, the standards promulgated by the Appraisal Foundation known as the Uniform Standards of Professional Appraisal Practice (USPAP). In all cases where IAAO and/or USPAP requirements cannot be satisfied for reasons of practicality or irrelevancy, P&A subscribes to “generally accepted appraisal methods and techniques” so that its value conclusions are credible and defensible. P&A submits annual or biannual contract bids to the Appraisal District Board of Directors or the Office of the Chief Appraiser and is bound to produce appraisal estimates on mineral properties within the cost constraints of said bid. Any appraisal practices and procedures followed by P&A not explicitly defined or allowed through IAAO or USPAP requirements are specified by the Texas Property Tax Code or at the specific request or direction of the Office of the Chief Appraiser.

Appraisal Resources

Personnel: The Mineral Valuation Division staff consists of competent Petroleum Engineers, Geologists, and Appraisers. All personnel are Registered Professional Appraisers with the State of Texas, or are progressing towards this designation within the allowable time frames prescribed by the Texas Department of Licensing and Regulation (TDLR) and/or other licensing and regulatory agencies as applicable.

Data: For each mineral property a common set of data characteristics (i.e. historical production, price and expense data) is collected from various sources and entered into P&A's mainframe computer system. Historical production data and price data is available through state agencies (Texas Railroad Commission, Texas Comptroller, et al.) or private firms who gather, format and repackage such data for sale commercially. Each property's characteristic data drives the computer-assisted mass appraisal approach to valuation.

Information Systems: The mainframe systems are augmented by the databases that serve the various in-house and 3rd-party applications on desktop personal computers. In addition, communication and dissemination of appraisals and other information is available to the taxpayer and client through electronic means including internet and other phone-line connectivity. The appraiser supervising any given contract fields many of the public's questions or redirects them to the proper department personnel.

VALUATION APPROACH (MODEL SPECIFICATION)

Concepts of Value: The valuation of oil and gas properties is not an exact science, and exact accuracy is not attainable due to many factors. Nevertheless, standards of reasonable performance do exist, and there are usually reliable means of measuring and applying these standards.

Petroleum properties are subject to depletion, and capital investment must be returned before economic exhaustion of the resource (mineral reserves). The examination of petroleum properties involves understanding the geology of the resource (producing and non-producing), type of reservoir energy, the methods of secondary and enhanced recovery (if applicable), and the surface treatment and marketability of the produced petroleum product(s).

Evaluation of mineral properties is a continuous process; the value as of the lien date merely represents a "snapshot" in time. The potential value of mineral interests derived from sale of minerals to be extracted from the ground change with mineral price fluctuation in the open market, changes in extraction technology, costs of extraction, and other variables such as the value of money.

Approaches to Value for Petroleum Property

Cost Approach: The use of cost data in an appraisal for market value is based upon the economic principle of substitution. The cost approach typically derives value by a model that begins with replacement cost new (RCN) and then applies depreciation in all its forms (physical depreciation, functional and economic obsolescence). This method is difficult to apply to oil and gas properties since lease acquisition and development may bear no relation to present worth. Though very useful in the appraisal of many other types of properties, the cost approach is not readily applicable to mineral properties. [Keep in mind that the property actually being appraised is the mineral interest and not the oil and gas reserves themselves. Trying to apply the cost approach to evaluation of mineral interests is like trying to apply the cost approach to land; it is a moot point because both are real properties that are inherently non-replaceable.] **As a general rule, and for the reasons stated above, Pritchard & Abbott, Inc., does not employ the cost approach in the appraisal of mineral interests.**

Market Approach: This approach may be defined as one which uses data available from actual transactions recorded in the market place itself; i.e., sales of comparable properties from which a comparison to the subject property can be made. Ideally, this approach's main advantage involves not only an opinion but an opinion supported by the actual spending of money. Although at first glance this approach seems to more closely incorporate the aspects of fair market value per its classical definition, there are two factors that severely limit the usefulness of the market approach for appraising oil and gas properties. First, oil and gas property sales data is seldom disclosed (in non-disclosure states such as Texas); consequently there is usually a severe lack of market data sufficient for meaningful statistical analysis. Second, all conditions of each sale

must be known and carefully investigated to be sure one does have a comparative indicator of value per fair market value prerequisites.

Many times when these properties do change hands, it is generally through company mergers and acquisitions where other assets in addition to oil and gas reserves are involved; this further complicates the analysis whereby a total purchase price must be allocated to the individual components - a speculative and somewhat arbitrary task at best. In the case of oil and gas properties, a scarcity of sales requires that every evidence of market data be investigated and analyzed. Factors relative to the sale of oil and gas properties are:

- current production and estimated declines forecast by the buyer;
- estimated probable and potential reserves;
- general lease and legal information which defines privileges or limitation of the equity sold;
- undeveloped potential such as secondary recovery prospects;
- proximity to other production already operated by the purchaser;
- contingencies and other cash equivalents; and
- other factors such as size of property, gravity of oil, etc.

In the event that all these factors are available for analysis, the consensus effort would be tantamount to performing an income approach to value (or trying to duplicate the buyer's income approach to value), thereby making the market approach somewhat moot in its applicability. **As a general rule, and for the reasons stated above, Pritchard & Abbott, Inc., rarely employs a rigorous application of the market approach in the appraisal of mineral interests.**

Income Approach: This approach to value most readily yields itself to the appraisal of mineral interests. Data is readily available whereby a model can be created that reasonably estimates a future income stream to the property. This future income may then be converted (discounted) into an estimate of current value. Many refer to this as a capitalization method, because capitalization is the process of converting an income stream into a capital sum (value). As with any method, the final value is no better than the reliability of the input data. The underlying assumption is that people purchase the property for the future income the property will yield. If the land or improvements are of any residual value after the cessation of oil and gas production, that value should also be included (if those components are also being appraised).

The relevant income that should be used is the expected future net income. Assumptions of this method are:

- Past income and expenses are not a consideration, except insofar as they may be a guide to estimating future net income.
- That the producing life as well as the reserves (quantity of the minerals) are estimated for the property.
- Future income is less valuable than current income, and so future net income must be discounted to make it equivalent to the present income. This discount factor reflects the premium of present money over future money, i.e., interest rate, liquidity, investment management, and risk.

As a general rule, and for the reasons stated above, Pritchard & Abbott, Inc., relies predominantly on the income approach to value in the appraisal of mineral interests.

DATA COLLECTION/VALIDATION

Sources of Data: The main source of P&A's property data is data from the Railroad Commission of Texas as reported by operators. As a monthly activity, the data processing department receives data tapes or electronic files which have updated and new well and production data. Other discovery tools are fieldwork by appraisers, financial data from operators, information from chief appraisers, tax assessors, trade publications and city and local newspapers. Other members of the public often provide P&A information regarding new wells and other useful facts related to property valuation.

Another crucial set of data to obtain is the ownership of these mineral interests. Typically a mineral lease is fractionated and executed with several if not many owners. This information is typically requested (under a promise of confidentiality concerning owners' personal information) from pipeline purchasers and/or other entities (such as operators) who have the

responsibility of disbursing the income to the mineral interest owners. Another source of ownership information is through the taxpayers themselves who file deeds of ownership transfer and/or correspond with P&A or the appraisal district directly.

Data Collection Procedures: Electronic and field data collection requires organization, planning and supervision of the appraisal staff. Data collection procedures for mineral properties are generally accomplished globally by the company; i.e., production and price data for the entire state is downloaded at one time into the computer system. Appraisers also individually gather and record specific and particular information to the appraisal file records, which serves as the basis for the valuation of mineral properties. P&A is divided into four district offices covering different geographic areas. Each office has a district manager, appraisal and ownership maintenance staff, and clerical staff as appropriate. While overall standards of performance are established and upheld for the various district offices, quality of data is emphasized as the goal and responsibility of each appraiser.

VALUATION ANALYSIS (MODEL CALIBRATION)

Appropriate revisions and/or enhancements of schedules or discounted cash flow software are annually made and then tested prior to the appraisals being performed. Calibration typically involves performing multiple discounted cash flow tests for leases with varying parameter input to check the correlation and relationship of such indicators as: Dollars of Value Per Barrel of Reserves; Dollars of Value Per Daily Average Barrel Produced; Dollars of Expense Per Daily Average Barrel Produced; Years Payout of Purchase Price (Fair Market Value). In a more classical calibration procedure, the validity of values by P&A's income approach to value is tested against actual market transactions, if and when these transactions and verifiable details of these transactions are disclosed to P&A. Of course these transactions must be analyzed for meeting all requisites of fair market value definition. Any conclusions of this analysis are then compared to industry benchmarks for reasonableness before being incorporated into the calibration procedure.

INDIVIDUAL VALUE REVIEW PROCEDURES

Individual property values are reviewed several times in the appraisal process. P&A's discounted cashflow software dynamically generates various benchmark indicators that the appraiser reviews concurrent with the value being generated. These benchmarks often prompt the appraiser to reevaluate some or all of the parameters of data entry so as to arrive at a value more indicative of industry standards. Examples of indicators are dollars of value per barrel of oil reserve, years payout, etc. In addition to appraiser review, taxpayers are afforded the opportunity to review the appraised values, either before or after Notices of Appraised Value are prepared. Operators routinely meet with P&A's appraisers to review parameters and to provide data not readily available to P&A through public or commercial sources, such as individual lease operating expense and reserve figures. And of course, all property values are subject to review through normal protest and Appraisal Review Board procedures, with P&A acting as an extension of the Office of the Chief Appraiser.

PERFORMANCE TESTS

An independent test of the appraisal performance of properties appraised by P&A is conducted by the State of Texas Comptroller's Office through the annual Property Value Study for school funding purposes. This study determines the degree of uniformity and the median level of appraisal for mineral properties. School jurisdictions are given an opportunity to appeal any preliminary findings. After the appeal process is resolved, the Comptroller publishes a report of the findings of the study, including in the report the median level of appraisal, the coefficient of dispersion around the median level of appraisal and any other standard statistical measures that the Comptroller considers appropriate.

USPAP STANDARDS RULE 6-1: MASS APPRAISAL OF INDUSTRIAL, UTILITY AND RELATED PERSONAL PROPERTY

Note: This section, in conjunction with any attached or separately provided P&A-generated appraisal reports specific to the subject property or properties, constitutes the “mass appraisal written report” as required by USPAP Standards Rule 6-1. USPAP Standards Rule 6-2 (certification) can be found at the end of this report. USPAP Standards Rules 5-1 through 5-7 (instructions and explanations regarding the development, application, and reconciliation of mass appraisal values), as they apply to P&A mass appraisal procedures, are discussed below. USPAP DOES NOT DICTATE THE FORM, FORMAT, OR STYLE OF APPRAISAL REPORTS, WHICH ARE FUNCTIONS OF THE NEEDS OF USERS AND PROVIDERS OF APPRAISAL SERVICES. USPAP ALSO DOES NOT MANDATE THAT EACH APPRAISAL REPORT BE LENGTHY AND FULL OF DISCLAIMERS. Readers should note that all P&A reports, unless stated otherwise, are of a “restricted” nature whereas additional documentation and detail may be available per certain Texas Property Tax Code provisions.

INTRODUCTION

Definition of Appraisal Responsibility: The Engineering Services Department of Pritchard & Abbott, Inc. (P&A) is responsible for developing fair and uniform market values for industrial, utility and personal properties.

P&A’s typical client is a governmental entity charged with appraisal responsibility for ad valorem tax purposes, although other types of clients (private businesses, individuals, etc.) occasionally contract for appraisal services which are strictly for various non-ad valorem tax purposes so that no conflicts of interest are created with P&A’s core ad valorem tax work.

P&A hereby makes the assumption that, in all appraisal assignments performed for governmental entities in satisfaction of contractual obligations related to ad valorem tax, the client does not wish to or cannot legally request the appraisal report not identify the client.

Intended users of our reports are typically the client(s) for which we are under direct contract. Although taxpayers or their agents who own and/or represent the subject property being appraised often receive these reports either by law or as a courtesy of the client or P&A, this receipt does not mean these parties automatically become Intended Users as defined by USPAP. **A party receiving a copy of a report in order to satisfy disclosure requirements does not become an intended user of the appraisal or mass appraisal unless the appraiser specifically identifies such party as an intended user.** Potential other users include parties involved in adjudication of valuation disputes (review board members, lawyers, judges, etc.), governmental agencies which periodically review our appraisals for various statutory purposes (such as the Texas Comptroller’s Office) and private parties who may obtain copies of our appraisals through Open Records Requests made to governmental agencies.

P&A believes this section of this report, in conjunction with any attached or separately provided P&A-generated report(s), meets the USPAP definition of “typical practice”; i.e., it satisfies a level of work that is consistent with:

- the expectations of participants in the market for the same or similar appraisal services; and
- what P&A’s peers’ actions would be in performing the same or similar appraisal services in compliance with USPAP.

This section of P&A’s USPAP report is not applicable to any Industrial, Utility, or related Personal Property that an appraisal district appraises outside of P&A’s appraisal services, in which case the appraisal district’s overall USPAP report should be referenced.

P&A makes the **Extraordinary Assumption** that all properties appraised for ad valorem tax purposes are marketable whereas ownership and title to property are free of encumbrances and other restrictions that would affect fair market value to an extent not obvious to the general marketplace. If and/or when we are made aware of any encumbrances, etc., these would be taken into account in our appraisal in which case the extraordinary assumption stated above would be revoked.

Legal and Statutory Requirements: The provisions of the Texas Property Tax Code and relevant legislative measures involving appraisal administration and procedures control the work of P&A as a subcontractor to the Appraisal District. P&A is responsible for appraising property on the basis of its market value as of January 1 for ad valorem tax purposes for each taxing unit that imposes ad valorem taxes on property in the contracted Appraisal District. All industrial, utility and personal properties are reappraised annually. The definition of Fair Market Value is provided and promulgated for use in ad valorem tax work in Texas by the Texas Property Tax Code, and therefore as a **Jurisdictional Exception** supercedes the definition of “market value” as found in USPAP definitions.

Administrative Requirements: P&A follows generally accepted and/or recognized appraisal practices and when applicable, the standards of the International Association of Assessing Officers (IAAO) regarding its appraisal practices and procedures. P&A, when applicable, also subscribes to the standards promulgated by the Appraisal Foundation known as the Uniform Standards of Professional Appraisal Practice (USPAP). P&A submits annual or biannual contract bids to the Office of the Chief Appraiser and is bound to produce appraisal estimates on industrial, utility and personal properties within the cost constraints of said bid. Any appraisal practices and procedures followed by P&A not explicitly defined through IAAO or USPAP requirements are specified by the Texas Property Tax Code and/or at the specific request or direction of the Office of the Chief Appraiser.

Appraisal Resources

Personnel: The Engineering Services Department and P&A’s appraisal staff consists of appraisers with degrees in engineering, business and accounting. All personnel are Registered Professional Appraisers with the State of Texas, or are progressing towards this designation as prescribed by the Texas Department of Licensing and Regulation (TDLR).

Data: A set of data characteristics (i.e. original cost, year of acquisition, quantities, capacities, net operating income, property description, etc.) for each industrial, utility and personal property is collected from various sources. This data is maintained in either hard copy or computer files. Each property’s characteristic data drives the appropriate computer-assisted appraisal approach to valuation.

Information Systems: P&A’s mainframe computer system is composed of in-house custom software augmented by schedules and databases that reside as various applications on personal computers (PC). P&A offers a variety of systems for providing property owners and public entities with information services.

VALUATION APPROACH (MODEL SPECIFICATION)

Concepts of Value: The valuation of industrial, utility and personal properties is not an exact science, and exact accuracy is not attainable due to many factors. These are considered complex properties and some are considered Special Purpose properties. Nevertheless, standards of reasonable performance do exist, and there are reliable means of measuring and applying these standards.

The evaluation and appraisal of industrial, utility and personal property relies heavily on the discovery of the property followed by the application of recognized appraisal techniques. The property is subject to inflation and depreciation in all forms. The appraisal of industrial and personal property involves understanding petroleum, chemical, steel, electrical power, lumber and paper industry processes along with a myriad of other industrial processes. Economic potential for this property usually follows either the specific industry or the general business economy. The appraisal of utility properties involves understanding telecommunications, electrical transmission and distribution, petroleum pipelines and the railroad industry.

Utility properties are subject to regulation and economic obsolescence. The examination of utility property involves the understanding of the present value of future income in a regulated environment.

The goal for valuation of industrial, utility and personal properties is to appraise all taxable property at "fair market value". The Texas Property Tax Code defines Fair Market value as 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 purchaser 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 purchaser seek to maximize their gains and neither is in a position to take advantage of the exigencies of the other.

Approaches to Value for Industrial, Utility, and Personal Property

Cost Approach: The use of cost data in an appraisal for market value is based upon the economic principle of substitution. This method is most readily applicable to the appraisal of industrial and personal property and some utility property. Under this method, the market value of property equals the value of the land plus the current cost of improvements less accrued depreciation. An inventory of the plant improvements and machinery and equipment is maintained by personally inspecting each facility every year. **As a general rule, and for the reasons stated above, Pritchard & Abbott, Inc., relies predominantly on the cost approach to value in the appraisal of industrial, utility, and personal property.**

Market Approach: This approach is characterized as one that uses sales data available from actual transactions in the market place. There are two factors that severely limit the usefulness of the market approach for appraising industrial, utility and personal properties. First, the property sales data is seldom disclosed; consequently there is insufficient market data for these properties available for meaningful statistical analysis. Second, all conditions of sale must be known and carefully investigated to be sure one does have a comparative indicator of value. Many times when these properties do change hands, it is generally through company mergers and acquisitions where other assets and intangibles in addition to the industrial, utility and personal property are involved. The complexity of these sales presents unique challenges and hindrances to the process of allocation of value to the individual components of the transaction.

In the case of industrial, utility and personal properties, a scarcity of sales requires that all evidence of market data be investigated and analyzed. Factors relative to the sale of these properties are:

- plant capacity and current production; terms of sale, cash or equivalent;
- complexity of property;
- age of property;
- proximity to other industry already operated by the purchaser; and
- other factors such as capital investment in the property.

As a general rule, and for the reasons stated above, Pritchard & Abbott, Inc., rarely employs a rigorous application of the market approach in the appraisal of industrial, utility, and personal property.

Income Approach: This approach to value most readily yields itself to all income generating assets, especially utility properties. Data for utility properties is available from annual reports submitted to regulatory agencies whereby future income may be estimated, and then this future income may be converted into an estimate of value. The valuation of an entire company by this method is sometimes referred to as a Unit Value. Many refer to this as a capitalization method, because capitalization is the process of converting an income stream into a capital sum (value). As with any method, the final value estimate is no better than the reliability of the input data. The underlying assumption is that people purchase the property for the future income the property will yield.

The relevant income that should be used in the valuation model is the expected future net operating income after depreciation but before interest expense (adjustments for Federal Income Taxes may or may not be required). Assumptions of this method are:

- Past income and expenses are a consideration, insofar as they may be a guide to future income, subject to regulation and competition.
- The economic life of the property can be estimated.
- The future production, revenues and expenses can be accurately forecasted. Future income is less valuable than current income, and so future net income must be discounted to make it equivalent to the present income. This discount factor reflects the premium of present money over future money, i.e., interest rate, liquidity, investment management, and risk.

As a general rule, and for the reasons stated above, Pritchard & Abbott, Inc., employs the income approach in the appraisal of industrial and utility property only when quantifiable levels of income are able to be reliably determined and/or projected for the subject property. P&A does not employ the income approach in the appraisal of personal property.

DATA COLLECTION/VALIDATION

Sources of Data: The main source of P&A's property data for industrial and personal property is through fieldwork by the appraisers and commercially/publicly available schedules developed on current costs. Data for performing utility appraisals is typically provided by the taxpayer or is otherwise available at various regulatory agencies (Texas Railroad Commission, Public Utilities Commission, FERC, et. al.). Other discovery tools are financial data from annual reports, information from chief appraisers, renditions, tax assessors, trade publications and city and local newspapers. Other members of the public often provide P&A information regarding new industry and other useful facts related to property valuation.

Data Collection Procedures: Electronic and field data collection requires organization, planning and supervision of the appraisal staff. Data collection procedures have been established for industrial and personal properties. Appraisers gather and record information in the mainframe system, where customized programs serve as the basis for the valuation of industrial, utility and personal properties. P&A is divided into multiple district offices covering different geographic zones. Each office has a district manager and field staff. While overall standards of performance are established and upheld for the various district offices, quality of data is emphasized as the goal and responsibility of each appraiser. Additionally, P&A's Engineering Services Department provides supervision and guidance to all district offices to assist in maintaining uniform and consistent appraisal practices throughout the company.

VALUATION ANALYSIS (MODEL CALIBRATION)

The validity of the values by P&A's income and cost approaches to value is tested against actual market transactions, if and when these transactions and verifiable details of the transactions are disclosed to P&A. These transactions are checked for meeting all requisites of fair market value definition. Any conclusions from this analysis are also compared to industry benchmarks before being incorporated in the calibration procedure. Appropriate revisions of cost schedules and appraisal software are annually made and then tested for reasonableness prior to the appraisals being performed.

INDIVIDUAL VALUE REVIEW PROCEDURES

Individual property values are reviewed several times in the appraisal process. P&A's industrial, utility, personal property programs and appraisal spreadsheets afford the appraiser the opportunity to review the value being generated. Often the appraiser is prompted to reevaluate some or all of the parameters of data entry so as to arrive at a value more indicative of industry standards. Examples of indicators are original cost, replacement cost, service life, age, net operating income, capitalization rate, etc. In addition to appraiser review, taxpayers are afforded the opportunity to review the appraised values

either before or after Notices of Appraised Value are prepared. Taxpayers, agents and representatives routinely meet with P&A's appraisers to review parameters and to provide data not readily available to P&A through public or commercial sources, such as investment costs and capitalization rate studies. And of course, all property values are subject to review through normal protest and Appraisal Review Board procedures, with P&A acting as a representative of the Office of the Chief Appraiser.

PERFORMANCE TESTS

An independent test of the appraisal performance of properties appraised by P&A is conducted by the State of Texas Comptroller's Office through the annual Property Value Study for school funding purposes. This study determines the degree of uniformity and the median level of appraisal for utility properties. School jurisdictions are given an opportunity to appeal any preliminary findings. After the appeal process is resolved, the Comptroller publishes a report of the findings of the study, including in the report the median level of appraisal, the coefficient of dispersion around the median level of appraisal and any other standard statistical measures that the Comptroller considers appropriate.