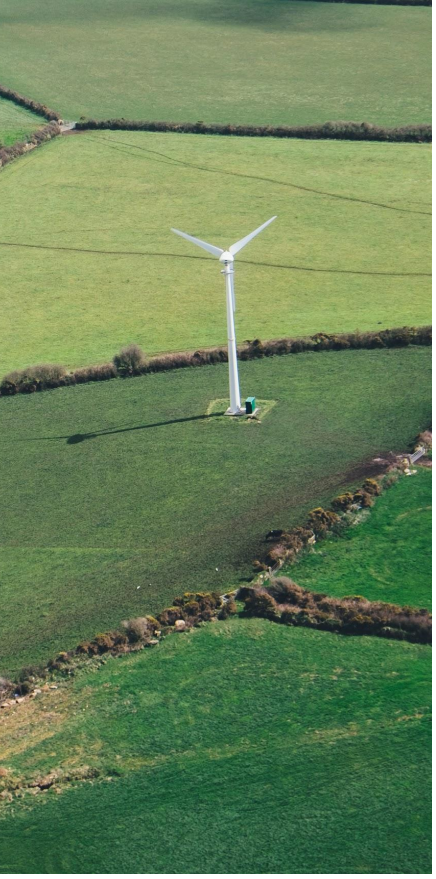


State of
Texas

An Update on Digital Parcel Data in Texas

August 2019

AppGeo

Empowering People with Spatial Solutions

Table of Contents

Executive Summary 3

1. Project Overview 5
   - 1.1 Project Background 6
   - 1.2 Statewide Parcel Program Progress 7
   - 1.3 Project Goal and Objectives 9
   - 1.4 Project Approach 10
2. Information Gathering 11
   - 2.1 Outreach 12
   - 2.2 Public Information Request 13
   - 2.3 Interviews 14
   - 2.4 Non-GIS Parcel Data Assessment 15
   - 2.5 CAD Parcel Data Status 16
3. Recommendations 17
   - 3.1 Overview of Recommendations 18
   - 3.2 CAD-Level Recommendations 19
   - 3.3 Statewide Parcel Program Recommendations 21
   - 3.4 Action Plan 23
4. Appendices 24
   - I. Program Announcement Letter 25
   - II. Interview Questions 27
   - III. Standard Parcel Schema 29
   - IV. Parcel Data Status for all Texas CADs 31

Executive Summary

Project Background

Based on research conducted in 2016 for the Texas Geographic Information Officer's report, it was evident that a statewide database of land parcel boundaries would be a tremendous asset for the state of Texas. In 2017, The Texas Natural Resources Information System (TNRIS), performed a study and statewide survey to determine the availability of digital parcel data and to assess the feasibility of collecting and aggregating authoritative parcel data across the state.

Statewide Parcel Program Progress

Since the initial parcel study in 2017, TNRIS has made great strides in progressing the Statewide Parcel Program in the following key areas:

- Data collection - to date, 220 GIS parcel datasets have been collected and are available for download
- Centralized data access and distribution - TNRIS launched the DataHub in June 2019 for central data access, download and sharing
- Establish data and database guidelines - a standardized schema has been developed for GIS parcel data sharing
- Relationship building - TNRIS has worked to form key partnerships at the national, state and local level
- Additional outreach and education - TNRIS has conducted numerous presentations, webinars, and committee meetings to educate stakeholders about the program
- Seek state agency or legislative support - TNRIS continues to build program support, both politically and financially.

Project Goals, Objectives and Approach

Given the successes so far of the parcel program, this project is aimed at providing an update to the previous study, with the focus being on closing the final GIS parcel data gap in the state of Texas. To accomplish this, the project has two key objectives: To understand the current situation for central or county appraisal offices (CADs) lacking GIS parcel data, and to develop recommendations for the continued growth and success of the program.

In general, the approach for this project, which ran from May to August 2019, was as follows:

- Public information request to gather as much data for remaining counties as possible
- Conduct follow-up phone interviews and direct in-person outreach to CADs without GIS parcel data
- Assess and evaluate findings
- Develop recommendations and action plan

Executive Summary *(continued)*

Information Gathering

TNRIS Outreach
2017 - present

Ongoing TNRIS Outreach was performed in previous years. At the outset of this project, 31 CADs remained that hadn't yet submitted data into the program.

Public Information Request
May 2019

In May 2019 a Public Information Request (PIR) was sent, and additional information was gathered such that only 9 CADs required additional follow-up.

Interviews
June - August 2019

Following all phone and in-person interviews, there are only four remaining CADs that don't yet have GIS parcel data in the State of Texas: Castro, Coleman, Donley and Hutchinson

Information requests were made via phone, email and in-person to gather as much information as possible about the remaining 31 CADs that were not yet participating in the project. In some cases, the project team was able to get access to GIS parcel data that had not been collected. In other cases, where no GIS parcel data exists yet, the team was able to speak with the CAD staff, often the chief appraiser, to understand the issues and challenges related to converting to GIS parcel data. These challenges were typically related to a lack of funding for GIS conversion, lack of support for GIS conversion, or lack of understanding of the benefits of GIS data.

Recommendations

Based on the findings in this project, the following recommendations are provided.

CAD-Level Recommendations

These recommendations are focused specifically on the remaining CADs that do not yet have GIS parcel data

- Education and outreach for CADs to demonstrate GIS benefits, and share key technical concepts
- Funding support for conversion and/or maintenance
- Incentive programs to increase participation
- Foster rapport with counties through regular check-ins

Statewide Parcel Program Recommendations

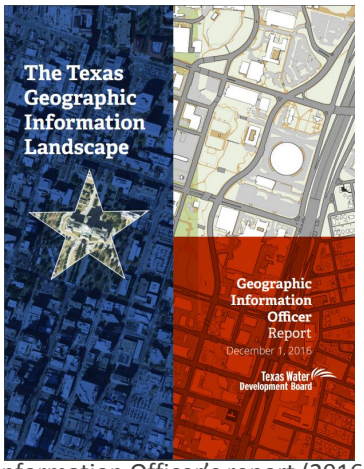
These recommendations are provided to help strengthen the program overall and ensure it continues to grow and be successful:

- Establish minimum content guidelines
- Streamline and strengthen the annual update process
- Establish incentives for CADs that proactively submit annual updates that are in alignment with the minimum content guidelines, such as
- Formalize a statewide parcel data committee
- Establish data governance policies and practices

1. Project Overview

1.1 Project Background

Texas state agencies, as well as private industry, utilize geographic information systems (GIS) data and services by solving shared problems, and creating value from statewide data and application resources. **In 2016, research for the Texas Geographic Information Officer's report, pictured on the right, revealed that the single greatest need for state agency business was a statewide database of land parcel boundaries updated on an annual basis.** Texas state agencies prioritized the need for a statewide geospatial parcel dataset to support the many use cases ranging across the transportation, environmental, and safety sectors of state government. For example, priority use cases for these data include assisting in emergency preparation, response, and recovery efforts.

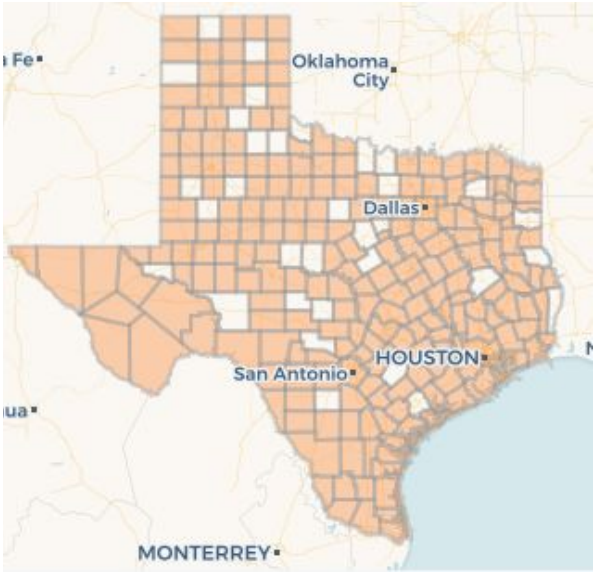


Texas Geographic Information Officer's report (2016)

Statewide Report on Digital parcel Data in Texas (2017)

The Texas Natural Resources Information System (TNRIS), a division of the Texas Water Development Board (TWDB), performed a study and statewide survey in 2017, led by AppGeo, pictured on the left. The study determined the availability of digital parcel data from the 254 central or county appraisal districts (CADs) to assess the feasibility of collecting and aggregating parcel data from local authoritative sources. **Since the initial study, digital parcel data for 220 counties has been collected and was available for download as of May 2019.** This represents a significant amount of work and is a great success for the state of Texas.

However, at the outset of this project, there were 31 CADs that had not shared data into the program, as indicated by the non-shaded counties in the map on the right. It was unknown whether these CADs simply did not have GIS parcel data or perhaps needed outreach and encouragement to share the data. As such, these CADs required direct contact and evaluation in order to assess the current state of the data and willingness to participate.



Map of Texas counties with available digital parcel data, snapshot taken August 1, 2019

1.2 Statewide Parcel Program Progress

The mission of TNRIS is to bring together the Texas GIS community at all levels and all areas of the state to identify and prioritize geospatial data needs, establish consistent standards to facilitate interoperability, and to serve timely, accurate, and accessible data. Since the 2017 parcel study, progress has been made towards a statewide geographic parcel dataset which is at the crux of TNRIS' mission. Facilitating all of the efforts below is the Geographic Data Coordinator, whose role was created as a result of the 2017 Texas Parcel Data Study (Digital Parcel Data in Texas). This section outlines the significant efforts taken by TNRIS and its Coordinator to achieve their mission.

Data collection

State government sponsored efforts to collect, aggregate, and harmonize county data into a standard, statewide dataset

The TNRIS Geographic Data Coordinator has been successful in collecting GIS parcel data from the vast majority of CADs in the state. In a parallel effort to this outreach and assessment of the remaining counties, TNRIS is conducting an ongoing effort, referenced herein as the *Parcel Data Standardization* project. The goal of this project is to continue the collection of data and convert all existing GIS parcel datasets into a standardized schema for publishing and public use.

Centralized data access and distribution

Provide a centralized source for data access to facilitate, distribute, and download various geographic datasets

TNRIS launched the DataHub in June 2019. The DataHub combines all of TNRIS' Data Catalog, Data Download, Data Ordering, and online mapping services into one easy-to-use online application. It provides information and access to all of TNRIS' available data, including land parcel data specific to this project effort. From June 1 to July 31, 2019 there have been 7,481 parcel data downloads. These data are available on the TNRIS DataHub at data.tnris.org.

Establish data and database guidelines

Develop a standard database schema for analysis and usage across multiple parcel datasets

TNRIS' Geographic Data Coordinator assembled a Land Parcel and Address Point committee of parcel creators and parcel consumers to establish a standard GIS parcel data schema. This schema contains the most common attributes needed by stakeholders such as unique parcel identifiers, situs address information, mailing addresses, and data source information (See Appendix III). The *Parcel Data Standardization* project is using extract, transform, and load (ETL) processes to transform the source data from the CAD into the standardized schema, without editing the authoritative data source.

1.2 Statewide Parcel Program Progress *(continued)*

Relationship building

Strengthen relationships at various governmental levels to promote the program

At the national level, TNRIS met and discussed the program with land parcel professional members of the National States Geographic Information Council (NSGIC) and Urban Regional Information Systems Association (URISA). At the local level, TNRIS has conducted many onsite visits with local appraisal districts, consultants, and contractors in Texas to promote positive relationships and gain a better understanding of their process.

Additional outreach and education

Conduct presentations, webinars, and outreach to stakeholders to raise awareness of the program

Since the original published study in 2017, TNRIS has educated stakeholders via public presentations and webinars regarding the parcel data program as speaker or hosts at conferences. Other outreach efforts include presentations at the Texas GIS Community meetings, Texas GIS Solution group meetings, and the URISA Speaker series. Additionally, TNRIS has reached out to professional assessor and appraisal organizations through conferences either as a vendor or speaker at the events.

Seek state agency or legislative support

Seek sponsorship or partnership from a lead agency to gain additional statewide support for this effort

TNRIS has made a concerted effort to continue conversations with the Texas Comptroller of Public Accounts staff regarding the shared needs of this data in conjunction with the Electronic Appraisal Roll Submission report. Additionally, statewide agencies such as the Texas Department of Transportation, Texas Commission on Environmental Quality, Texas Parks and Wildlife, the Texas General Land Office, and the Commission on State Emergency Communications have provided grant funding and programmatic support.

1.3 Project Goal and Objectives

Through this project, starting in May 2019 and ending in August 2019, AppGeo worked with TNRIS to provide an extension of the initial program outreach focusing on the CADs that lacked GIS parcel data or have been unresponsive to outreach thus far. **The overarching project goal was to close the final GIS parcel data gap in the state of Texas.** This was accomplished by collecting any available GIS parcel data and by assessing current conditions to determine the best actions to assist and support CADs without GIS parcel data. The two key project objectives below provide the framework for this project:

Objective #1: Understand the current situation for CADs lacking GIS parcel data

What is the current status of parcel data?

Does the CAD have any form of digital data?

Is the digital data in a GIS format?

How are parcels maintained and updated?

Can the data be shared?

Does support exist for a GIS Parcel Dataset?

Does the CAD understand the benefits of GIS data?

Is there sufficient organizational and leadership support for migrating to GIS parcels?

What challenges or constraints exist?

Is there a lack of funding?

Is further education and outreach needed?

Would the CAD be able to keep the GIS parcels maintained, once they were developed?

Objective #2: Develop Recommendations

What actions can TNRIS take to

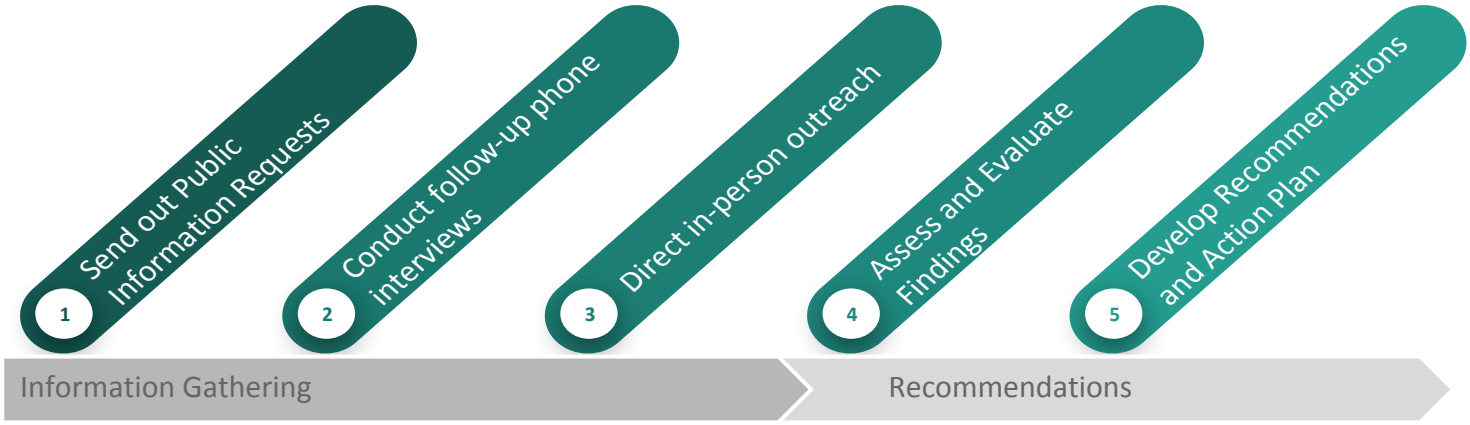
- ✓ Support these CADs to help close the GIS Parcel data gap in the state of Texas
- ✓ Ensure the statewide parcel program continues to grow and succeed

Based on the information gathered throughout the course of this project, AppGeo and the TNRIS Geographic Data Coordinator collaboratively developed a set of recommendations to support these CADs in converting their parcels to GIS, and for continuing to strengthen the statewide parcel program as a whole. These recommendations are presented in section three of this report.

1.4 Project Approach

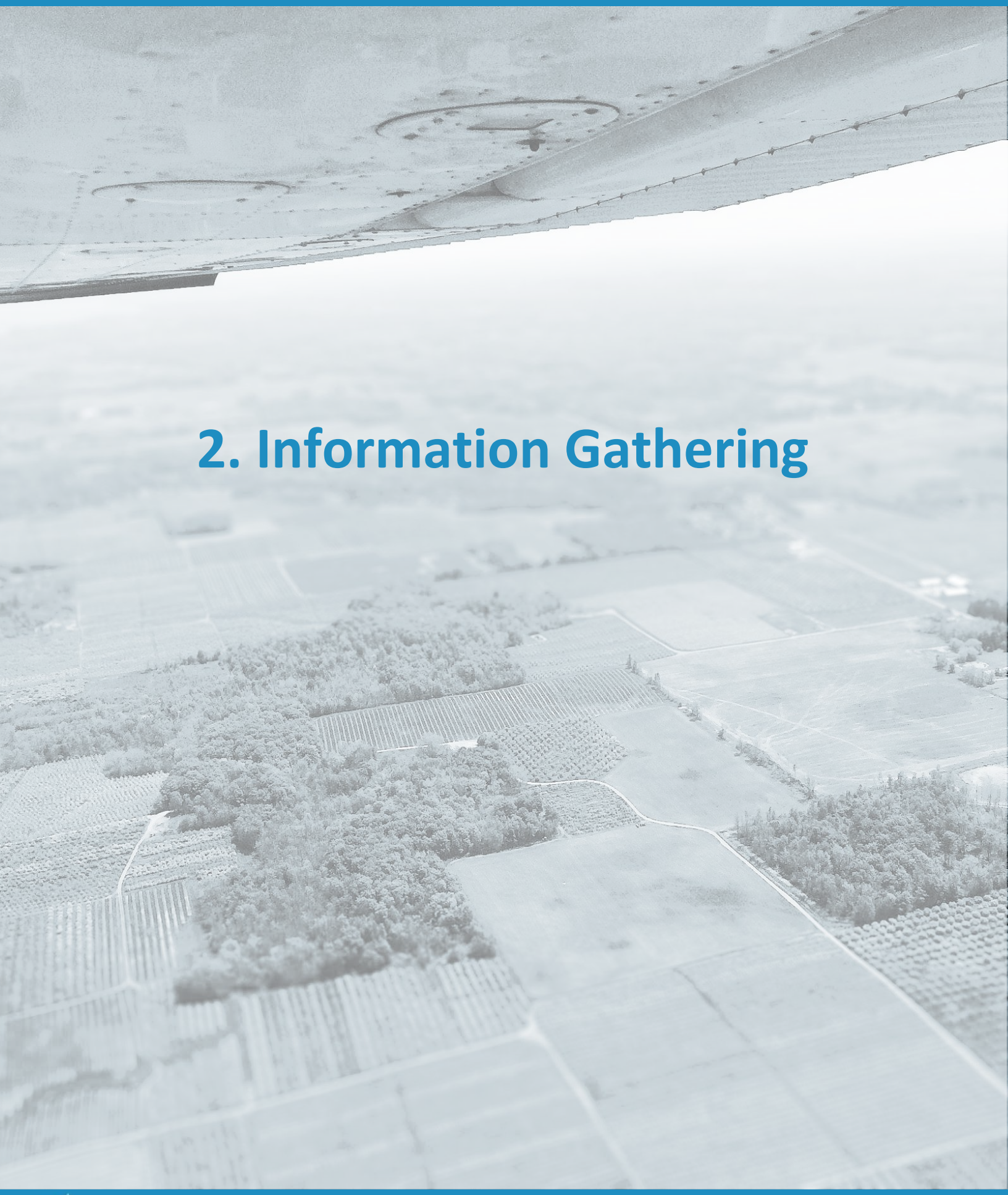
Prior to this project, TNRIS employed multiple means to gather CAD parcel data from online searches, email correspondence, and phone correspondence, which are explained in further detail in section 2.1. After these numerous outreach efforts, 31 counties had not yet submitted parcel data. To understand what type of parcel data the remaining counties had, as well as any technical, economical, and political realities that may prohibit these counties from contributing to a statewide GIS parcel dataset, renewed efforts and a new approach for information gathering was needed.

After initial discussions with TNRIS on the issues they faced when previously attempting to contact the remaining counties, it was decided that a multi-faceted outreach approach would be the most efficient way to gather the required information for the remaining CADs in this study. A high level breakdown of the project approach is reflected in the diagram below.



All of the information gathering steps were conducted in a collaborative manner between AppGeo and TNRIS project team members. TNRIS sent out a Public Information Request (PIR) on May 28, 2019 to the 31 countries. This was done as a final approach after the initial outreach attempts to obtain a baseline understanding of each CADs parcel dataset were not met. As CADs responded to the PIR, TNRIS and AppGeo determined what follow-up actions were needed based on the PIR outcomes for each CAD. In some cases, AppGeo performed direct, targeted phone outreach to certain counties to gather more information and dig deeper to better understand the current situation, challenges, and available parcel data. In addition to these phone interviews, and given the reticent nature of some of the remaining counties, TNRIS and AppGeo discussed and agreed that an on-the-ground, in-person approach was needed to fully assess these counties. AppGeo brought BIS Consulting into the project team to conduct these in-person meetings, to represent local expertise and knowledge, and to encourage participation and information sharing with the remaining counties. For both the phone interviews and the in-person meetings, the goal was to speak with the Chief Appraiser in each CAD, and potentially with any technical or GIS staff. A list of standard questions was developed to ensure that the same information was being gathered from each CAD (see Appendix II for questions).

The Project Findings (section 2) contains the results of each stage of the information gathering. All findings from the information gathering were used to develop the recommendations and action plan, which are presented in Recommendations (section 3)



2. Information Gathering

2.1 Outreach

Prior to conducting this parcel study extension with AppGeo, TNRIS contacted all 254 CADs to determine the status of their parcel data. The following section outlines the methods by which TNRIS gathered information from the CADs:

Arguably the most successful method in gathering responses from the CADs was the program announcement letter (Appendix I) sent on November 7th, 2018 that highlighted the importance of the program, what the state needed from each CAD going forward, and the potential benefits each CAD could realize if they participated in the program. Further details on the parcel program can be found on the TNRIS Land Parcel site.

In conjunction with the program announcement letter, TNRIS conducted online searches to each central or county appraisal district's website to review what data were available. Downloaded any available CAMA, GIS, or DGN files or requested information on how to purchase that data.

If data was not readily available online, TNRIS made phone calls to the CADS requesting information on how they process and store their parcel data. The calls were aimed at gathering data if it was available, but also understanding motives behind why a CAD may not have converted to GIS data.

Along with the aforementioned information gathering methods, TNRIS conducted regular email correspondence with the CADs to purchase or receive data. Additionally, TNRIS spoke to many of the prominent consultant groups in Texas such as Pritchard & Abbott, BIS Consulting, and Harris Govern who provide the CADs with either CAMA data or parcel data. Relationships with these service providers were established to ensure they understood the project and its importance to the state. This program would not compete with their business models as there are differing goals.

2.2 Public Information Request

The Texas Public Information Act gives citizens the right to access all public information from a government agency when requested. Using this act as a reference, the final data information gathering method utilized was an official **Public Information Request (PIR) sent by TNRIS on May 28, 2019**. The request asked CADs to respond with any information on their parcel data: what format it is in, if they can provide it, or if it is available for purchase.

The 31 PIR respondents fell into one of three categories, shown below. Table 1 details the response of each CAD to the PIR.

The CAD has GIS Parcel data or is in the process of converting. In these cases, the data (if available) was processed as part of the parallel *Parcel Data Standardization* efforts (see page 7). (22 total)

The CAD has no GIS Parcel data, but responded with further information about either a non-GIS digital data format, or indicating that they maintain paper maps.
(5 total)

The CAD did not respond to the PIR, but was responsive when called directly.
(4 total)

Following this successful response to the PIR, the focus of the study shifted to the latter two categories above, specifically understanding the status of the following nine CADs:

- **Caldwell**
- **Castro**
- **Coleman**
- **Donley**
- **Hamilton**
- **Hutchinson**
- **Jack**
- **Newton**
- **Victoria**

Table 1. PIR Results

CAD	PIR RESPONSE
CALDWELL	**Direct outreach required**
CASTRO	**DGN + Microstation CAD available**
COLEMAN	**Paper maps**
CONCHO	GIS data available
DAWSON	Converting
DONLEY	**Atlas file available**
EASTLAND	GIS data available
ERATH	GIS data available
GARZA	GIS data available
HAMILTON	**Direct outreach required**
HARRISON	GIS data available
HEMPHILL	GIS data available
HOOD	GIS data available
HOPKINS	GIS data available
HUTCHINSON	**Bentley File available**
JACK	**Bentley File available**
KERR	GIS data available
MONTAGUE	GIS data available
MOTLEY	GIS data available
NACOGDOCHES	GIS data available
NEWTON	**Direct outreach required**
PARKER	GIS data available
RUNNELS	GIS data available
SABINE	GIS data available
SCURRY	GIS data available
STEPHENS	GIS data available
TERRY	GIS data available
TRAVIS	GIS data available
VICTORIA	**Direct outreach required**
WEBB	GIS data available
WISE	GIS data available

2.3 Interviews

All nine CADs responded and agreed to participate in interviews, either in person or over the phone. The following summarizes the findings of these discussions, including commonalities and prevailing responses.

Existing GIS Parcel Data

- Victoria CAD
- Hamilton CAD
- Newton CAD
- Caldwell CAD
- Jack CAD *(in progress)*

During the phone interviews, it was discovered that four CADs, listed above, had GIS parcel data they would be able to share for processing within the parallel *Parcel Data Standardization* project. Further, it was found that Jack CAD was already in the process of converting their parcels to a GIS format and would be able to share the data when the conversion was complete (estimated to be sometime in 2020).

Barriers to Data Conversion

- Expense to convert and maintain is too high
- Do not see benefits or need because county is small
- Lack of interest from Board of Directors
- Lack of interest to learn new technologies
- Challenging to maintain data after conversion

The most frequently mentioned roadblock to conversion was the cost associated with converting and then maintaining GIS parcel data. Some counties found that the time it would take to convert would be too disruptive and inconvenient to their existing workload. Other counties did not wish to convert because they did not see the benefits of converting to GIS parcel data or did not have the time to learn how to maintain a new record keeping system.

Data Maintenance Challenges

- Conflicting information on property ownership
- Wearing multiple hats in the CAD office
- Legislative changes

Five of the nine CADs make updates in-house (Coleman, Caldwell, Hamilton, Newton, Victoria). Three CADs (Castro, Donley, Hutchinson) use commercial outside contractors and Jack CAD uses an independent contractor for data maintenance. For most CADs, responding to requests or making changes to the parcel data takes between two and four weeks, since there is not a dedicated GIS position or department. Maintenance can fall to the wayside when the county or central appraisal office has an influx of seasonal requests. Additional roadblocks mentioned were changes to legislation, making it difficult to keep records standard, and abandoned properties making accurate property boundaries difficult.

2.4 Non-GIS Parcel Data Assessment

The following five CADs do not have GIS data, but provided information on their existing parcel data and how it is maintained in their systems: Castro, Coleman, Donley, and Hutchinson.

The assessment in Table 2 below establishes the relative level of effort (LOE) needed to convert each CAD into a GIS format. All assessments were based on reviewing their existing data combined with their willingness to convert to GIS data as discussed in the phone interviews and onsite visits. Further details about each CADs interview can be found in the CAD-Level Recommendations section of this report (section 3.2) .

Medium Conversion Effort
The CAD has enough information in their digital files to convert, but there would be a significant effort involved.

High Conversion Effort
The CAD does not have enough data or information to easily convert to a GIS data format, and would likely need to do a full data automation project.

CAD	Data Format	Data Source	Approx. Number of Parcels	Level of Effort to Convert to GIS Format	Potential Roadblocks to Conversion & Notes
Castro	DGN	Pritchard & Abbott, Inc.	4,500	Medium	DGN has parcel lines and annotations, multiple files. No polygons, only lines, in data.
Coleman	Paper	LOCAL	18,000	High	Paper maps are scanned as changes are made; they see no need to convert. Maps hand drawn with parcel ID number referenced.
Donley	Atlas	Pritchard & Abbott, Inc.	8,000	High	On version 1.0 of Atlas, unable to leverage existing software to convert to a usable GIS dataset.
Hutchinson	DGN	Pritchard & Abbott, Inc.	21,000	Medium	Includes parcels, dimensions anno, owner name, prop_id, and other data (i.e city limits, roads, road names etc.).

Table 2. Level of Effort to convert to GIS data

2.5 CAD Parcel Data Status

Table 3. CAD Parcel Data Status

CAD		Parcel Data Status
CALDWELL	✔	GIS data available
CASTRO		DGN + Microstation CAD available
COLEMAN		Paper maps
CONCHO	✔	GIS data available
DAWSON		Converting to GIS
DONLEY		Atlas file available
EASTLAND	✔	GIS data available
ERATH	✔	GIS data available
GARZA	✔	GIS data available
HAMILTON	✔	GIS data available
HARRISON	✔	GIS data available
HEMPHILL	✔	GIS data available
HOOD	✔	GIS data available
HOPKINS	✔	GIS data available
HUTCHINSON		Bentley File available
JACK		Converting to GIS
KERR	✔	GIS data available
MONTAGUE	✔	GIS data available
MOTLEY	✔	GIS data available
NACOGDOCHES	✔	GIS data available
NEWTON	✔	GIS data available
PARKER	✔	GIS data available
RUNNELS	✔	GIS data available
SABINE	✔	GIS data available
SCURRY	✔	GIS data available
STEPHENS	✔	GIS data available
TERRY	✔	GIS data available
TRAVIS	✔	GIS data available
VICTORIA	✔	GIS data available
WEBB	✔	GIS data available
WISE	✔	GIS data available

The table at the left provides a full summary of parcel data status in the 31 remaining CADs that were the focus of this report as of the time of writing this report.

Twenty-five (25) of the CADs have GIS parcel data available.

Two (2) of the CADs (Jack and Dawson) are in the process of converting their data to GIS.

Four (4) of the CADs (Castro, Coleman, Donley and Hutchinson) do not have GIS parcel data. Further recommendations on these four CADs are provided in section 3.

Please see Appendix IV for a full list of parcel data status for all CADs in the State of Texas.

3. Recommendations

3.1 Overview of Recommendations

The recommendations described in this report fall into two main categories, as shown below, and are described in detail in the sections that follow.

CAD-Level Recommendations

These are targeted recommendations, aimed at closing the final GIS parcel data gap in the state of Texas.

- Education and outreach for counties to demonstrate GIS benefits and share key technical concepts
- Funding support for conversion and/or maintenance
- Incentive programs to increase participation
- Foster rapport with counties through regular check-ins

Statewide Parcel Program Recommendations

This set of recommendations is aimed at ensuring the ongoing success of the Texas parcel program.

- Establish minimum content guidelines
- Streamline and strengthen the annual update process
- Establish incentives to boost participation
- Formalize a statewide parcel data committee
- Establish data governance policies and practices

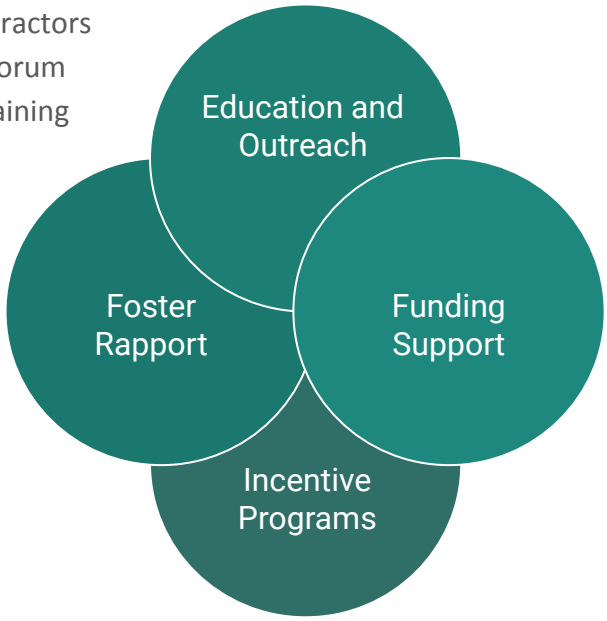
3.2 CAD-Level Recommendations

The following recommendations have been developed to focus specifically on the four remaining counties that do not have GIS parcel data and do not have any current plans to convert to GIS parcel data. These recommendations are intended to help assure these counties that converting to GIS is worth the effort, and to help support these efforts financially, technically, or otherwise.

Recommendations for Remaining Counties

TNRIS should consider the following activities to help support these final counties and encourage GIS parcel conversion and participation in the statewide parcel program:

- Education and outreach for counties
  - Conduct in-person meetings tailored to each CAD to clarify the major benefits of converting and maintaining data in a GIS parcel format, including TNRIS' best offer to help the CAD in the conversion process based on the findings outlined within the report
  - Focus the meeting on how GIS data can help with managing tax information, improve citizen engagement, identify underserved areas of the community, and save time during the busy tax protest seasons
  - Bring trusted vendors to assist with the presentations if considered appropriate
  - Make clear the differences between digital computer-aided design (CAD) files, such as DGN files, and GIS, and the overall benefits of GIS when comparing the two options
  - Provide technical outreach and educational webinars about using and maintaining the data, as well as building quality data for counties in the process of converting
- Funding support if/when available
  - Provide one-time funding support for conversion costs
  - Develop an annual grant program to help with ongoing maintenance
- Incentive programs for participation
  - Advertise online that the imagery program is free for participating appraisal districts and partnered contractors
  - Provide reduced attendance fee at the Texas GIS Forum
  - Provide reduced or no-cost software licenses or training hosted by TNRIS
- Foster rapport
  - Reach out via email or physical mail to CADs quarterly about events/projects/etc. that might interest them and get them involved with the GIS community
  - Brief phone calls every six months to build relationships with the CADs and mention any events that could be of interest to them



The next page provides specifics on which recommendations are most needed in each of the four focus counties.

3.2 CAD-Level Recommendations *(continued)*

Specific recommendations for each CAD

All of the CADs would likely benefit from stronger rapport and some level of funding support. In addition, specific recommendations were created for each of the remaining counties who did not have plans to convert with further details on why those recommendations were selected for each CAD:

Castro CAD

After discussions with Castro CAD, it seems that they are not yet convinced of the benefits of GIS, and not yet ready to tackle conversion. Thus, the recommended approach would be educational outreach efforts such as workshops or in person meetings centered on how GIS data could benefit their county. Showing Castro how GIS data could help them manage and collect tax information more effectively, generate mailing lists, and improve decision making within the county are all points that could help realize the benefits of conversion to GIS. Following that initial education, the next steps would be to provide additional education on how best to maintain GIS data if they plan to perform the data maintenance in-house. It was also discovered that there is data for Castro CAD available for download via a third-party data vendor, OGInfo.com. This potential data should be investigated further to understand how current and accurate it is.

Coleman CAD

As Coleman county is small, the CAD office has been able to manage their workload effectively with paper maps for years. The paper maps are in good condition and records are kept up to date. Additionally, they have CAMA data available through a vendor. Conversion would not be too difficult; however, as the status quo works for them, it may be difficult to convince them to go through the effort of converting to GIS data. The first step TNRIS could take would be to educate them on how their specific needs, and the needs of their citizens, could be better met by GIS data and would be greatly beneficial, especially if combined with grant support or some other financial incentive. From there, building a relationship with the CAD by providing incentives to attend forums, conferences, or webinars could help the CAD long-term.

Donley CAD

While there is software available to convert Atlas files to Shapefiles, the conversion software does not support the version of Atlas that Donley is currently using. The files that have been converted only show lines and not polygons. One option would be to provide technical help and/or funding support to convert to a newer version of Atlas and then work to convert those files to GIS data. Education on data maintenance best practices would be key, and should be tied into the conversion process. Depending on the cost comparison, it may be worth simply remapping the entire county in GIS format. Educational outreach and assistance from TNRIS would be needed to entice the CAD to follow through with GIS conversion.

Hutchinson CAD

There is plenty of support internally to convert to GIS data, however, the cost to convert is a limiting factor. Assistance through a grant would greatly help Hutchinson get their parcel data converted to GIS. If a grant was provided and their data converted, there was a clear desire to receive education on how to best maintain their data in-house to keep costs low and gain valuable skills. TNRIS has already reached out to Hutchinson to discuss how they can help.

3.3 Statewide Parcel Program Recommendations

As the program matures, the goal is that CADs will become more active participants and begin to realize the benefits themselves of having access to other neighboring county data. The following recommendations are aimed at ensuring continued program success, growth, and CAD participation.

Establish minimum content guidelines

- These would not be requirements, but "Best Practices" for key data items that should be included, aligned with the standardized schema, as well as guidance on how to store and maintain the data properly in GIS format.
- Establishing these guidelines will give CADs with less GIS expertise some basic goals to strive for. When followed, these guidelines will also help to improve data quality overall.

Streamline and strengthen the annual update process

The following recommendations will help to increase active participation and create a sustainable update cycle

- Continue outreach to county or central appraisal districts in the form of workshops and educational webinars
- Consider marketing efforts to spread the word about the project successes and available data
- Encourage counties to publish their own data on the web to allow for easy retrieval each year
- **Establish Memoranda of Understanding (MOUs) with CADs**
    - MOUs would not be required for participation or data sharing
    - An MOU would establish a formal partnership, agree on update intervals, make clear the shared value, and establish mutual understanding of the program and the roles and responsibilities that both the CAD and TNRIS are agreeing to.
    - An MOU could become a standard part of the annual data update workflow.

Establish incentives for proactive CADs that adopt minimum content guidelines or best practices

- State funding/support for ongoing GIS parcel data maintenance
- Reduced attendance fee at the Texas GIS Forum
- Statewide recognition as being an active participant in the form of a public award at forums or conferences, and listed on the TNRIS site for reference
- Continued free use of Texas Imagery Program

3.3 Statewide Parcel Program Recommendations *(continued)*

Formalize a statewide parcel data committee

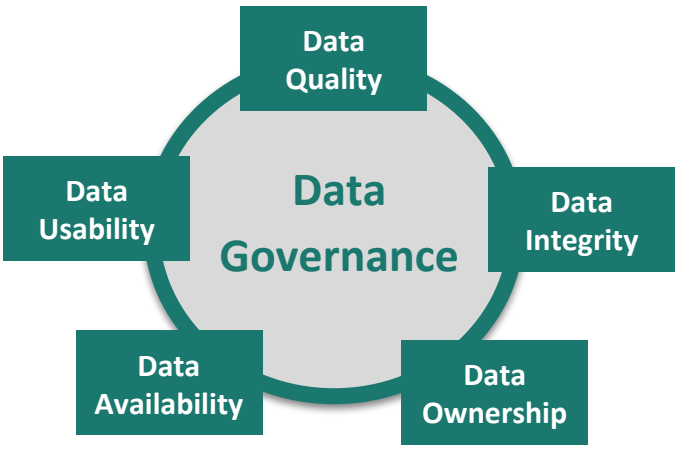
TNRIS has already utilized a committee of this nature for specific tasks, such as to define the initial statewide parcel schema. Formalizing such a committee would have long term benefits and help to ensure continued success of the program. This committee would

- Represent a wide variety of stakeholders, views, and use cases across the state
- Provide oversight, guidance, and direction to the program as it matures and evolves
- Help make key strategic decisions about the program and ensure continued alignment with program goals and objectives
- Be responsible for establishing, managing, and monitoring the Data Governance practices, described below. This could include changes to the data collection and dissemination procedures, use constraints, data structure, etc.

Establish data governance policies and practices

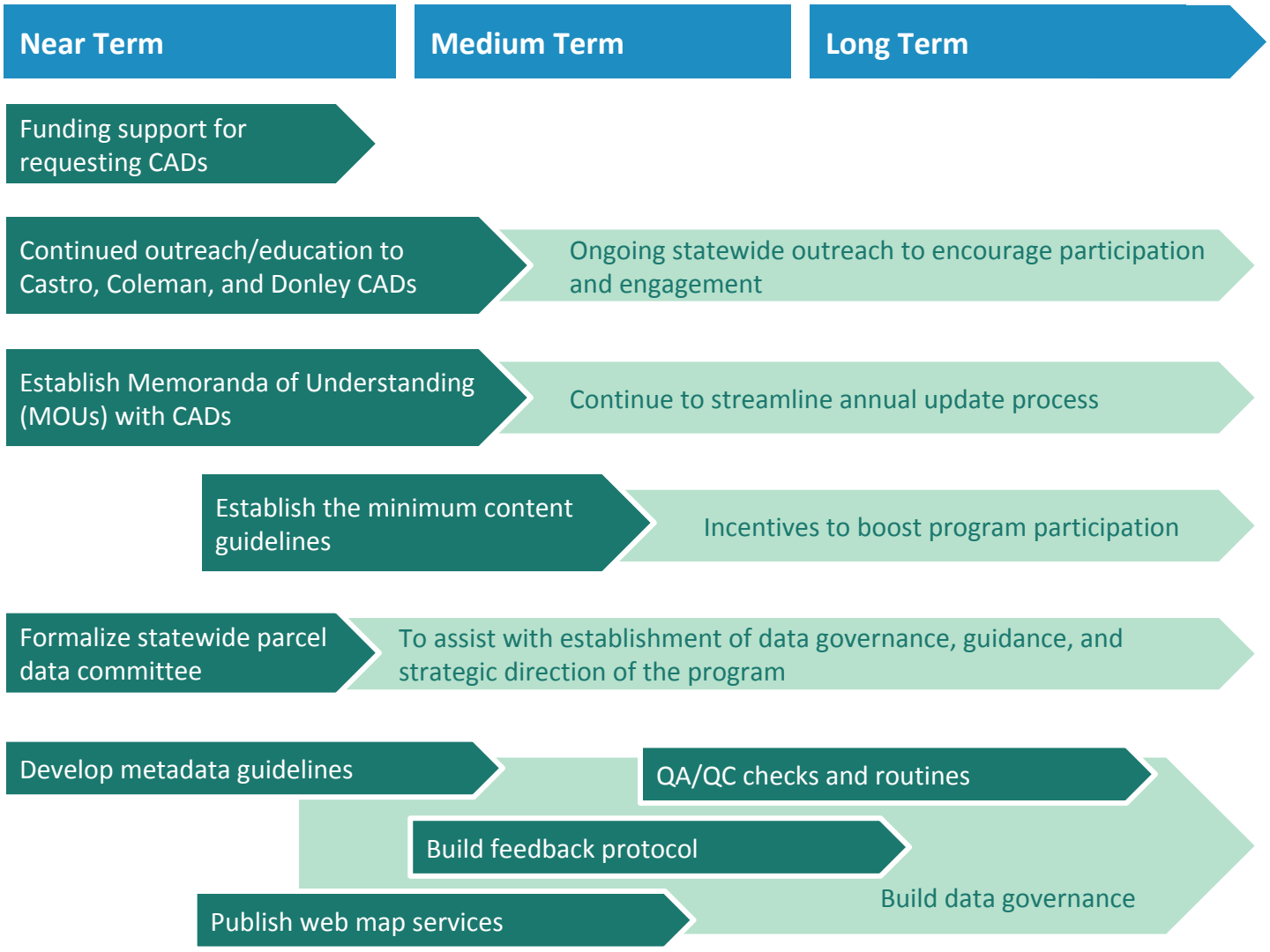
Data governance includes a set of practices and policies to ensure that a key dataset is of high quality and provides the intended value to its users. As the statewide parcel data gets more use, it is inevitable that users will begin to have feedback and questions, which will be directed to TNRIS. The following Data Governance recommendations will help ensure data quality and access, while also mitigating any risks.

- Develop **clear and concise metadata guidelines**. For example, ensure data published clearly indicates the authoritative data source (i.e., the CAD) and includes details about what (if any) processes TNRIS may have performed prior to publishing (field mapping, field calculations, etc.)
- Build and publish a set of **QA/QC checks and routines** that are in alignment with the Minimum Content Guidelines to allow CADs to perform validations and check their own data
- Publish the parcel data via **web map services** to ensure wide availability and access to the data.
- Establish a protocol for **collecting, evaluating, and managing the feedback loop**. This may include a ticket system for capturing comments/feedback, assigning responsibility (i.e., TNRIS or the data owner), taking any needed action, and ultimately communicating outcomes to the user. Major decisions and actions taken should be made in collaboration with the Statewide Parcel Data Committee.



3.4 Action Plan

The diagram below depicts the high-level action plan for moving forward and implementing the various recommendations in this report. This plan provides a relative sense of priority and which items should be tackled first, in the near term, and which will be longer-term, ongoing endeavors.



Appendices

Appendix I. Program announcement letter

Appendix II. Interview questions

Appendix III. Standard parcel schema

Appendix IV. Parcel Data Status for all Texas CADs

Appendix I. Program Announcement Letter

The following was sent to all Chief Appraisers in Texas on November 7th, 2018

Dear Chief Appraiser,

My name is Richard Wade, and I am the state Geographic Information Officer (GIO) for Texas. One of my most important job responsibilities is to identify geographic data needs and coordinate the collection of geographic data to improve the efficiency of state business.

We have established a statewide data initiative that involves the collection and dissemination of address points and land parcel boundaries at a statewide level. We discovered that Texas state agencies consider these datasets to be two of the most valuable data products for state business and emergency management operations during our development of the inaugural Texas Geographic Information Officer Report. We experienced the value of these data during the Hurricane Harvey response and the recent flooding in central and south Texas.

Address points and parcel boundaries are created and maintained by several hundred authoritative sources across the state including appraisal districts, cities, counties, councils of governments, and utility companies. Our primary goal is to coordinate with authoritative sources, when possible, to gather these data and compile them into one central location for distribution to state agencies and the public. These data will be updated annually as requested by the state agencies. We also intend to contribute the address points to the National Address Database, which will be beneficial during national emergencies and other federal activities.

As the state's centralized geographic clearinghouse, Texas Natural Resources Information System (TNRIS) has begun collecting these data and is engaging with data creators to coordinate the acquisition of these data and to establish regular update cycles. Goals for each dataset are currently being established through a series of stakeholder meetings, and results will be posted online.

This is a very large undertaking for the state; however, creating a statewide dataset for address points and land parcel data will greatly benefit the state and citizens of Texas during emergency events as well as to streamline the efficiency and effectiveness of state agencies to do their routine business.

If you should have any questions or concerns about these initiatives, please contact the TNRIS Geographic Data Coordinator Ilyanna Kadich at ilyanna.kadich@twdb.texas.gov or 512-475-1559.

Sincerely,

Richard Wade
Deputy Executive Administrator/State GIO
Texas Natural Resources Information System

The following was sent to all Chief Appraisers in Texas following the program announcement letter:

Based on feedback we received from yesterday's letter of notification below, we have the following update:

If you have geospatial parcel or address point data available to share, please email me at ilyanna.kadich@twdb.texas.gov with directions on how to acquire the data. I am also interested in having your geospatial staff contact information for future data needs.

Thank you for your cooperation in this statewide initiative.

Ilyanna Kadich, MPAff
Geographic Data Coordinator
Texas Natural Resources Information System
Strategic Mapping Program

Appendix II. Interview Questions

The following questions were used as a guide for both the phone and onsite interviews with the various CADs.

Interview Questions

1. How is parcel/property data currently maintained? (For Coleman: How are your paper maps updated when parcel boundaries change?)
    a. If they have GIS - ask follow-up questions about updates, maintenance, topology, and whether they can send us a copy
    b. If they don't have GIS or other digital data… ask some/all of questions 2-8

If no GIS data…

2. Why is the data currently maintained in this fashion (i.e. familiarity, ease of use to meet end needs, etc.)
3. Are there any roadblocks or recurring issues in how data is currently maintained or updated? Is it a significantly level of effort to make yearly updates to the data?
4. Do you feel your data is complete and has all the necessary and desired information?
5. Are you familiar with GIS data and the potential benefits of having GIS data?
    a. Discuss the benefits, such as:
        i. Streamlined data maintenance and sharing
        ii. Generate a countless variety of maps and tables that display and summarize property values, land use, tax revenues, and ownership
        iii. Improve decision making
        iv. Easily publish maps to the public via online maps
        v. Easily generate abutter mailing list through spatial query
        vi. Supports statewide GIS database and can answer critical needs for emergency response teams
6. What is the general interest, willingness, political support, etc. for migrating data to a GIS format?
7. Has conversion to GIS been started or partially attempted already? If so, what were the results?
8. Are there any barriers standing in the way - if so, what?

9. What source data is available to do a conversion to GIS?
10. What are the greatest perceived benefits of moving to GIS parcel data?
11. How might long-term maintenance of the data (once created) be managed?

Other questions for all:

12. Are you working with another vendor for property assessment or other property/ownership/CAMA data management? If so, who are they and what do they provide?
13. What is the approximate total number of parcels in your county?

Appendix III. Standard Parcel Schema

The standard parcel schema was created in consultation with members of the Land Parcel and Address Point Committee which includes members from TNRIS, DIR GIS Solutions Group, stakeholders across the state, and industry experts.

Geodatabase field name	Field type	Field length	Attribute	Description	Notes
PROP_ID	STRING	70	Unique ID	Source unique identifier that can be joined with other datasets	This ID can join to other CAMA data or EARS data
GEO_ID	STRING	50	Unique ID	Source unique identifier that can be joined with other datasets	This ID can join to other CAMA data or EARS data
OWNER_NAME	STRING	254	Owner name	Owner of the parcel	Owner of the parcel. Please omit any confidential records
NAME_CARE	STRING	254	Owner name in care of	Owner of the parcel	Owner of the parcel. Please omit any confidential records
LEGAL_AREA	DOUBLE	8	Legal area	Legal area per deed. The non-rounded value.	Legal area
LGL_AREA_UNIT	STRING	8	Legal area units	Legal area units per deed.	Example, acres or feet
GIS_AREA	DOUBLE	8	GIS area	The area calculated within GIS	Not legal area
GIS_AREA_UNIT	STRING	8	GIS area units	The area calculated units within GIS	Not legal area
LEGAL_DESC	STRING	254	Legal description	Legal description from deed	If this is multiple fields, please share the first field of the legal description. Able to concatenate up to 254 characters if multiple fields.
STAT_LAND_USE	STRING	5	Land use	Legal land use	Please provide a key for descriptions of land use codes. May be similar to these: https://comptroller.texas.gov/taxes/property-tax/docs/96-313.pdf
LOC_LAND_USE	STRING	5			
LAND_VALUE	DOUBLE	8	Land value	Current value of land	The current value of land only as of date of sharing this dataset
IMP_VALUE	DOUBLE	8	Improvement value	Current value of improvements	The current value of improvements as of date of sharing this dataset
MKT_VALUE	DOUBLE	8	Market value	Current market value	The current market value as of sharing this dataset

Geodatabase field name	Field type	Field length	Attribute	Description	Notes
SITUS_ADDR	STRING	254	Situs address	The main address of this property. Data concatenated into one field	The main address of the property. If multiple, use first complete address.
SITUS_NUM	STRING	15	Situs house number	The house number of the main property	The main address of the property. If multiple, use first complete address.
SITUS_STRE	STRING	10	Situs street directional or unit	The street directional or unit of the main property	The main address of the property. If multiple, use first complete address.
SITUS_ST_1	STRING	60	Situs street name	The street name of the main property	The main address of the property. If multiple, use first complete address.
SITUS_ST_2	STRING	60	Situs street info	The street name info of the main property	The main address of the property. If multiple, use first complete address.
SITUS_CITY	STRING	60	Situs city	The city of the main property	The main address of the property. If multiple, use first complete address.
SITUS_STAT	STRING	2	Situs state	The state of the main property	The main address of the property. If multiple, use first complete address.
SITUS_ZIP	STRING	5	Situs zip	The zip of the main property	The main address of the property. If multiple, use first complete address.
MAIL_ADDR	STRING	254	Mailing address	The mailing address for the owner of the property. Data concatenated into one field.	The mailing address of the property owner.
MAIL_LINE1	STRING	60	Mailing street, directional and unit	The mailing street, directional and unit	The mailing address of the property owner.
MAIL_LINE2	STRING	60	Additional mailing info	Additional mailing info	The mailing address of the property owner.
MAIL_CITY	STRING	60	Mailing city	The mailing city	The mailing address of the property owner.
MAIL_STAT	STRING	2	Mailing state	The mailing state	The mailing address of the property owner.
MAIL_ZIP	STRING	5	Mailing zip	The mailing zip code	The mailing address of the property owner.
SOURCE	STRING	100	Source	The source of this data. For example, appraisal district or name of vendor	
DATE_ACQ	INTEGER	5	Date acquired	The date TNRIS acquired this data.	
FIPS	STRING	5	County identifier	County jurisdiction 5 digit FIPS code	
COUNTY	STRING	60	County name	County name	
TAX_YEAR	INTEGER	4	Tax year	The year of this dataset	
YEAR_BUILT	INTEGER	4	Year built	The year the structure was built	Year structure was built

Appendix IV. Parcel Data Status for all Texas CADs

The table below provides a complete, updated list of all CADs in the State of Texas with their parcel data status and availability (as of August 29, 2019).

In summary, of the 254 total CADs:

- Data for 247 CADs has been received and standardized
  - 227 of these datasets are currently available for public download
  - 20 datasets are available for state and local gov't use only, via a license agreement
- Of the remaining 7 that have not been received yet:
  - 5 are in the process of being converted to GIS
  - 2 currently have no plans for conversion

CAD	Status of GIS Dataset	GIS Dataset Availability	Notes
ANDERSON	Received & standardized	Public download	
ANDREWS	Received & standardized	Public download	
ANGELINA	Received & standardized	Public download	
ARANSAS	Received & standardized	Public download	
ARCHER	Received & standardized	Public download	
ARMSTRONG	Received & standardized	Public download	
ATASCOSA	Received & standardized	Public download	
AUSTIN	Received & standardized	Public download	
BAILEY	Received & standardized	Public download	
BANDERA	Received & standardized	Public download	
BASTROP	Received & standardized	Public download	
BAYLOR	Received & standardized	Public download	
BEE	Received & standardized	Internal use only	License agreement - for state and local gov't use only.
BELL	Received & standardized	Public download	
BEXAR	Received & standardized	Public download	
BLANCO	Received & standardized	Public download	

Appendix IV. Parcel Data Status for all Texas CADs (*continued*)

CAD	Status of GIS Dataset	GIS Dataset Availability	Notes
BORDEN	Received & standardized	Public download	
BOSQUE	Received & standardized	Public download	
BOWIE	Received & standardized	Public download	
BRAZORIA	Received & standardized	Public download	
BRAZOS	Received & standardized	Public download	
BREWSTER	Received & standardized	Public download	
BRISCOE	Not received	Not available	In process of converting to GIS with BIS.
BROOKS	Received & standardized	Public download	
BROWN	Received & standardized	Public download	
BURLESON	Received & standardized	Public download	
BURNET	Received & standardized	Public download	
CALDWELL	Received & standardized	Public download	
CALHOUN	Received & standardized	Public download	
CALLAHAN	Received & standardized	Public download	
CAMERON	Received & standardized	Public download	
CAMP	Received & standardized	Public download	
CARSON	Received & standardized	Public download	
CASS	Received & standardized	Public download	
CASTRO	Received & standardized	Internal use only	License agreement - for state and local gov't use only. DGN files only - see parcel report for details.
CHAMBERS	Received & standardized	Internal use only	License agreement - for state and local gov't use only. In process of converting to GIS with P&A.
CHEROKEE	Received & standardized	Public download	
CHILDRESS	Received & standardized	Public download	

Appendix IV. Parcel Data Status for all Texas CADs (*continued*)

CAD	Status of GIS Dataset	GIS Dataset Availability	Notes
CLAY	Not received	Not available	In process of converting to GIS with P&A.
COCHRAN	Received & standardized	Public download	
COKE	Received & standardized	Public download	
COLEMAN	Not received	Not available	Paper maps - see parcel report for details.
COLLIN	Received & standardized	Public download	
COLLINGSWORTH	Received & standardized	Public download	
COLORADO	Received & standardized	Public download	
COMAL	Received & standardized	Public download	
COMANCHE	Received & standardized	Public download	
CONCHO	Received & standardized	Public download	
COOKE	Received & standardized	Public download	
CORYELL	Received & standardized	Public download	
COTTLE	Received & standardized	Internal use only	License agreement - for state and local gov't use only
CRANE	Received & standardized	Public download	
CROCKETT	Received & standardized	Internal use only	License agreement - for state and local gov't use only
CROSBY	Received & standardized	Internal use only	License agreement - for state and local gov't use only
CULBERSON	Received & standardized	Public download	
DALLAM	Received & standardized	Public download	
DALLAS	Received & standardized	Public download	
DAWSON	Received & standardized	Internal use only	License agreement - for state and local gov't use only. In process of converting to GIS at CAD.

Appendix IV. Parcel Data Status for all Texas CADs (*continued*)

CAD	Status of GIS Dataset	GIS Dataset Availability	Notes
DE WITT	Received & standardized	Public download	
DEAF SMITH	Received & standardized	Public download	
DELTA	Received & standardized	Public download	
DENTON	Received & standardized	Public download	
DICKENS	Received & standardized	Public download	
DIMMIT	Received & standardized	Public download	
DONLEY	Received & standardized	Internal use only	License agreement - for state and local gov't use only.
DUVAL	Received & standardized	Public download	
EASTLAND	Received & standardized	Public download	
ECTOR	Received & standardized	Public download	
EDWARDS	Received & standardized	Public download	
EL PASO	Received & standardized	Public download	
ELLIS	Received & standardized	Public download	
ERATH	Received & standardized	Public download	
FALLS	Received & standardized	Public download	
FANNIN	Received & standardized	Public download	
FAYETTE	Received & standardized	Public download	
FISHER	Received & standardized	Public download	
FLOYD	Received & standardized	Public download	
FOARD	Received & standardized	Public download	
FORT BEND	Received & standardized	Public download	
FRANKLIN	Received & standardized	Public download	
FREESTONE	Received & standardized	Public download	

Appendix IV. Parcel Data Status for all Texas CADs (*continued*)

CAD	Status of GIS Dataset	GIS Dataset Availability	Notes
FRIO	Received & standardized	Internal use only	License agreement - for state and local gov't use only. In process of converting to GIS with P&A.
GAINES	Received & standardized	Public download	
GALVESTON	Received & standardized	Public download	
GARZA	Received & standardized	Internal use only	License agreement - for state and local gov't use only. Will purchase data from CAD in FY2020.
GILLESPIE	Received & standardized	Public download	
GLASSCOCK	Received & standardized	Public download	
GOLIAD	Received & standardized	Public download	
GONZALES	Received & standardized	Internal use only	License agreement - for state and local gov't use only. In process of converting to GIS with P&A.
GRAY	Received & standardized	Public download	
GRAYSON	Received & standardized	Public download	
GREGG	Received & standardized	Public download	
GRIMES	Received & standardized	Public download	
GUADALUPE	Received & standardized	Public download	
HALE	Received & standardized	Public download	
HALL	Received & standardized	Public download	
HAMILTON	Received & standardized	Public download	
HANSFORD	Received & standardized	Public download	
HARDEMAN	Not received	Not available	In process of converting to GIS with P&A.
HARDIN	Received & standardized	Public download	
HARRIS	Received & standardized	Public download	
HARRISON	Received & standardized	Public download	
HARTLEY	Received & standardized	Public download	

Appendix IV. Parcel Data Status for all Texas CADs (*continued*)

CAD	Status of GIS Dataset	GIS Dataset Availability	Notes
HASKELL	Received & standardized	Public download	
HAYS	Received & standardized	Public download	
HEMPHILL	Received & standardized	Public download	
HENDERSON	Received & standardized	Public download	
HIDALGO	Received & standardized	Public download	
HILL	Received & standardized	Public download	
HOCKLEY	Received & standardized	Public download	
HOOD	Received & standardized	Public download	
HOPKINS	Received & standardized	Public download	
HOUSTON	Received & standardized	Internal use only	License agreement - for state and local gov't use only. In process of converting to GIS with P&A.
HOWARD	Received & standardized	Public download	
HUDSPETH	Received & standardized	Public download	
HUNT	Received & standardized	Public download	
HUTCHINSON	Not received	Not available	DGN files only - see parcel report for details.
IRION	Received & standardized	Public download	
JACK	Received & standardized	Public download	
JACKSON	Received & standardized	Public download	
JASPER	Received & standardized	Public download	
JEFF DAVIS	Received & standardized	Public download	
JEFFERSON	Received & standardized	Public download	
JIM HOGG	Received & standardized	Public download	
JIM WELLS	Received & standardized	Public download	
JOHNSON	Received & standardized	Public download	

Appendix IV. Parcel Data Status for all Texas CADs (*continued*)

CAD	Status of GIS Dataset	GIS Dataset Availability	Notes
JONES	Received & standardized	Public download	
KARNES	Received & standardized	Public download	
KAUFMAN	Received & standardized	Public download	
KENDALL	Received & standardized	Public download	
KENEDY	Received & standardized	Public download	
KENT	Received & standardized	Public download	
KERR	Received & standardized	Internal use only	License agreement - for state and local gov't use only. Will purchase data from CAD in FY2020.
KIMBLE	Received & standardized	Public download	
KING	Received & standardized	Public download	
KINNEY	Received & standardized	Public download	
KLEBERG	Received & standardized	Public download	
KNOX	Received & standardized	Public download	
LA SALLE	Received & standardized	Public download	
LAMAR	Received & standardized	Public download	
LAMB	Received & standardized	Public download	
LAMPASAS	Received & standardized	Public download	
LAVACA	Received & standardized	Public download	
LEE	Received & standardized	Public download	
LEON	Not received	Not available	In process of converting to GIS with P&A.
LIBERTY	Received & standardized	Public download	
LIMESTONE	Received & standardized	Public download	
LIPSCOMB	Received & standardized	Public download	
LIVE OAK	Received & standardized	Public download	

Appendix IV. Parcel Data Status for all Texas CADs (*continued*)

CAD	Status of GIS Dataset	GIS Dataset Availability	Notes
LLANO	Received & standardized	Public download	
LOVING	Received & standardized	Public download	
LUBBOCK	Received & standardized	Public download	
LYNN	Received & standardized	Public download	
MADISON	Received & standardized	Public download	
MARION	Received & standardized	Public download	
MARTIN	Received & standardized	Public download	
MASON	Received & standardized	Internal use only	License agreement - for state and local gov't use only. In process of converting to GIS with BIS.
MATAGORDA	Received & standardized	Public download	
MAVERICK	Received & standardized	Public download	
MCCULLOCH	Received & standardized	Public download	
MCLENNAN	Received & standardized	Public download	
MCMULLEN	Received & standardized	Public download	
MEDINA	Received & standardized	Public download	
MENARD	Received & standardized	Internal use only	License agreement - for state and local gov't use only. In process of converting to GIS with P&A.
MIDLAND	Received & standardized	Public download	
MILAM	Received & standardized	Public download	
MILLS	Received & standardized	Public download	
MITCHELL	Received & standardized	Public download	
MONTAGUE	Received & standardized	Public download	
MONTGOMERY	Received & standardized	Public download	
MOORE	Received & standardized	Public download	

Appendix IV. Parcel Data Status for all Texas CADs (*continued*)

CAD	Status of GIS Dataset	GIS Dataset Availability	Notes
MORRIS	Received & standardized	Public download	
MOTLEY	Received & standardized	Public download	
NACOGDOCHES	Received & standardized	Public download	
NAVARRO	Received & standardized	Public download	
NEWTON	Received & standardized	Public download	
NOLAN	Received & standardized	Public download	
NUECES	Received & standardized	Public download	
OCHILTREE	Received & standardized	Public download	
OLDHAM	Received & standardized	Internal use only	License agreement - for state and local gov't use only. In process of converting to GIS with BIS.
ORANGE	Received & standardized	Public download	
PALO PINTO	Received & standardized	Public download	
PANOLA	Received & standardized	Public download	
PARKER	Received & standardized	Public download	
PARMER	Received & standardized	Public download	
PECOS	Received & standardized	Public download	
POLK	Received & standardized	Public download	
POTTER	Received & standardized	Public download	
PRESIDIO	Received & standardized	Public download	
RAINS	Received & standardized	Public download	
RANDALL	Received & standardized	Public download	
REAGAN	Received & standardized	Public download	
REAL	Received & standardized	Public download	
RED RIVER	Received & standardized	Public download	

Appendix IV. Parcel Data Status for all Texas CADs (*continued*)

CAD	Status of GIS Dataset	GIS Dataset Availability	Notes
REEVES	Received & standardized	Public download	
REFUGIO	Received & standardized	Public download	
ROBERTS	Received & standardized	Internal use only	License agreement - for state and local gov't use only. In process of converting to GIS with BIS.
ROBERTSON	Received & standardized	Public download	
ROCKWALL	Received & standardized	Public download	
RUNNELS	Received & standardized	Public download	
RUSK	Received & standardized	Public download	
SABINE	Received & standardized	Public download	
SAN AUGUSTINE	Received & standardized	Public download	
SAN JACINTO	Received & standardized	Public download	
SAN PATRICIO	Received & standardized	Public download	
SAN SABA	Received & standardized	Public download	
SCHLEICHER	Received & standardized	Public download	
SCURRY	Received & standardized	Public download	
SHACKELFORD	Received & standardized	Public download	
SHELBY	Received & standardized	Internal use only	License agreement - for state and local gov't use only. In process of converting to GIS with HG.
SHERMAN	Not received	Not available	In process of converting to GIS with P&A.
SMITH	Received & standardized	Public download	
SOMERVELL	Received & standardized	Public download	
STARR	Received & standardized	Public download	
STEPHENS	Received & standardized	Public download	
STERLING	Received & standardized	Public download	

Appendix IV. Parcel Data Status for all Texas CADs (*continued*)

CAD	Status of GIS Dataset	GIS Dataset Availability	Notes
STONEWALL	Received & standardized	Public download	
SUTTON	Received & standardized	Public download	
SWISHER	Received & standardized	Public download	
TARRANT	Received & standardized	Public download	
TAYLOR	Received & standardized	Public download	
TERRELL	Received & standardized	Public download	
TERRY	Received & standardized	Internal use only	License agreement - for state and local gov't use only. Will purchase data from CAD in FY2020.
THROCKMORTON	Received & standardized	Public download	
TITUS	Received & standardized	Public download	
TOM GREEN	Received & standardized	Public download	
TRAVIS	Received & standardized	Public download	
TRINITY	Received & standardized	Public download	
TYLER	Received & standardized	Public download	
UPSHUR	Received & standardized	Public download	
UPTON	Received & standardized	Public download	
UVALDE	Received & standardized	Public download	
VAL VERDE	Received & standardized	Public download	
VAN ZANDT	Received & standardized	Public download	
VICTORIA	Received & standardized	Public download	
WALKER	Received & standardized	Public download	
WALLER	Received & standardized	Public download	
WARD	Received & standardized	Internal use only	License agreement - for state and local gov't use only. In process of converting to GIS with P&A.

Appendix IV. Parcel Data Status for all Texas CADs (*continued*)

CAD	Status of GIS Dataset	GIS Dataset Availability	Notes
WASHINGTON	Received & standardized	Public download	
WEBB	Received & standardized	Public download	
WHARTON	Received & standardized	Public download	
WHEELER	Received & standardized	Public download	
WICHITA	Received & standardized	Public download	
WILBARGER	Received & standardized	Public download	
WILLACY	Received & standardized	Public download	
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