

# Brown County

## Land Information Plan

2019-2021



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# EXECUTIVE SUMMARY

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**About this Document.** This plan was prepared by the Brown County Land Information Council. By statute, a plan for land records modernization is required for participation in the Wisconsin Land Information Program (WLIP). The purpose of this document is twofold: 1) to meet WLIP funding eligibility requirements necessary for receiving grants and retaining fees for land information, and 2) to plan for county land records modernization in order to improve the efficiency of government and provide improved government services to businesses and county residents. The format and content of this document are based upon the Wisconsin Department of Administration (WiDOA) *Uniform Instructions for Preparing County Land Information Plans* dated March 2018.

**Program Background.** The Land Information Program is administered by the Wisconsin Department of Administration and funded by document recording fees collected at the county level. In 2017, Brown County brought in about \$314,000 in program fee revenue, plus \$51,000 in grants along with other miscellaneous revenue. This plan lays out how funds from grants and retained fees will be prioritized. However, as the county budget is determined with County Executive and County Board approval, this plan provides estimated figures that are subject to change and are designed to serve planning purposes only.

**Land Information in Brown County.** Many of Brown County's essential services rely on accurate and up-to-date land information. Emergency response, resource conservation, infrastructure planning, economic development, facility maintenance, regulatory inspection and many other county functions involve the storage of, access to, and analysis of various land records. Efficient access to information about addresses, buildings, property boundaries, roads, utilities, elevations, floodplains, districts, wards, zoning, land use, and other combinations of land information is important for various functions of state, county and municipal government. This information is very beneficial to private businesses and citizens as well. Every day, hundreds of people connect to Brown County's land records and GIS systems to gather data to help make decisions.

**Mission of the Land Information Office.** The overall mission of the Brown County Land Information Office (LIO) is to provide support for all county functions that rely on storing, sharing, analyzing, and depicting information and records related to land. Brown County also strives to meet the needs of municipal, state and federal governments as well as businesses and citizens by providing exceptional public access to these records via the Internet.

**Project Summary.** In the next three years, the LIO will:

- ✦ Continue PLSS Remonumentation & parcel map framework enhancements
- ✦ Continue GIS data improvements and document indexing using GIS
- ✦ Complete Aerial Orthophotography and LiDAR projects
- ✦ Continue to improve the online GIS mapping sites
- ✦ Hire a GIS Specialist to assist with LIO and GIS responsibilities.

The projects in this plan are based on a user needs assessment conducted by the GIS Coordinator/Land Information Officer in 2018. The remainder of this document provides more details on Brown County and the WLIP, summarizes land information projects, and reviews the county's status in completion and maintenance of the WLIP map data layers known as Foundational Elements.

Once approved, this plan supersedes all previous Brown County Land Information Plans and sets the direction for land information program efforts for a time frame of 2019 – 2021.

# PROJECT SUMMARY

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The key projects planned for the next 3 years are described below. Each paragraph contains a summary of the project description, reason for the project, and funding source. More detailed project information can be found in Section 4 of this document.

**Project 1: Continue remonumenting Public Land Survey System (PLSS) corners.** To ensure accuracy of all property boundaries and GIS mapping, completing survey corner remonumentation and obtaining GPS coordinates on them is needed. The PLSS is the foundation for all boundary determinations and property ownership, and this project will help reduce confusion about them. Also, this investment will help reduce costs for private surveys and lower costs overall when doing construction and other land-related projects in Brown County. Many corners west of the Fox River in the Williams Grant and Oneida Indian Reservation have not been located or monumented since the original surveys in the 1800s. This project is being partially funded by a Wisconsin Land Information Program grant.

**Project 2: Scan more documents and index using GIS.** Currently, the GIS map is used to index over 30,000 land surveys, survey corner tie sheets, zoning permits, floodplain changes, and more. Indexing these documents using geography and GIS makes these documents easily retrievable for both internal and external customers via online GIS applications. This system has proven successful for tracking site-specific documents. In the next three years, we plan to expand this system to include more zoning information and additional document types such as soil tests and environmentally sensitive area (ESA) amendments. GIS links to other document imaging systems such as the Register of Deeds Laredo and Tapestry systems will also be maintained.

**Project 3: Produce aerial orthophotography in 2020.** Obtaining new aerial orthophotography every 3 years is a goal to help maintain all base map layers and track land use changes across the county. The last flight was in 2017. A 2020 flight would coincide with the Decennial Census. Coinciding the photos with census data collection can be useful in planning and other applications. Project funds will likely come from partners including local municipalities, utilities, federal grants and other sources including the Brown County Land Information Program revenues.

**Project 4: Produce LiDAR topographic mapping (including 1-foot elevation contours) in 2020.** Updating detailed topographic mapping every 10 years is the goal. The LiDAR data and the derivative products such as 1-foot elevation contours is extremely useful for regional storm water analysis, watershed planning, pollution abatement, preliminary construction design and earthwork cut/fill estimation, zoning review and transportation planning. The last LiDAR flight was done in 2010. A 2020 flight would coincide with aerial photos which is useful for planning, engineering and environmental applications. Project funds will likely come from partners including the federal 3DEP program grants as well as local municipalities, utilities, and Land Information Program grants.

**Project 5: Re-fill the vacant GIS Specialist position.** Hiring the GIS Specialist (formerly GIS Technician) is critical to ensure the success of this plan and Brown County's GIS. This position has not been funded since 2014 due to a shortfall in Land Information Program revenues and transfers of program dollars to support staff in the Property Listing division.

**Project 6: Maintain and enhance all Foundational Element GIS layers.** Regular upkeep is needed ON all land information "Foundational Elements" described in Section 2 of this plan. Keeping our existing system up-to-date is an important and significant effort. Project costs involve mostly staff time, paid for using Land Information Program revenues and other funding sources.

**Project 7: Evaluate new software tools such as Pintegrity and the Parcel Fabric.** These tools, and other software updates such as ArcGIS Pro, will be evaluated for their potential in streamlining work flows and making accurate, up-to-date information more easily available to all users of the data including the public. If we determine these tools to be useful, they would be purchased pending sufficient funding.

**Project 8: Rebuild the Land Information Office web site.** Brown County will be moving to a new web site template in 2019. This is a good opportunity to redesign and reorganize the Land Information page to make information easier to find.

**Project 9: Continuously improve the “BrownDog” and other GIS applications.** These in greater efficiency for staff and other users by speeding up searches for land information while doing common tasks (assisting citizens with information, making edits to the parcel map, etc). Project costs involve staff time using Land Information Program revenues.

**Project 10: Educate and train staff.** Training is very important to ensure people can effectively use the technology. The Land Information Program provides \$1000 in training & education grants each year; This is supplemented by other Land Information Program revenues as needed.

**Project 11: Enhance GIS data to support surface water drainage & hydrologic modeling.** GIS software tools such as ArcHydro use input GIS data including LiDAR topography, stream mapping, and culvert locations to model water flow across the surface and produce new GIS layers including detailed drainage patterns, flow accumulation maps, as well as catchment, basin and accurate watershed boundaries. This information can help with storm water planning, natural resource management, and water quality improvement efforts taking place across the county. The 2020 LiDAR project would produce a key input dataset for this project.

See Section 4 of this document for more details on these planned activities.

# 1 INTRODUCTION

In 1989, a public funding mechanism was created whereby a portion of county register of deeds document recording fees collected from real estate transactions would be devoted to land information through a new program called the Wisconsin Land Information Program (WLIP). The purpose of the land information plan is to meet WLIP requirements and aid in county planning for land records modernization.

## The WLIP and the Land Information Plan Requirement

In order to participate in the WLIP, counties must meet certain requirements:

- Update the county's land information plan at least every three years
- Meet with the county land information council to review expenditures, policies, and priorities of the land information office at least once per year
- Report on expenditure activities each year
- Submit detailed applications for WLIP grants
- Complete the annual WLIP survey
- Subscribe to DOA's land information listserv
- Coordinate the sharing of parcel/tax roll data with the Department of Administration in a searchable format determined by DOA under s. 59.72(2)(a)

### LAND INFORMATION

Any physical, legal, economic or environmental information or characteristics concerning land, water, groundwater, subsurface resources or air in this state.

'Land information' includes information relating to topography, soil, soil erosion, geology, minerals, vegetation, land cover, wildlife, associated natural resources, land ownership, land use, land use controls and restrictions, jurisdictional boundaries, tax assessment, land value, land survey records and references, geodetic control networks, aerial photographs, maps, planimetric data, remote sensing data, historic and prehistoric sites and economic projections.

– Wis. Stats. section 59.72(1)(a)

Any grants received and fees retained for land information through the WLIP must be spent consistent with the county land information plan.

## Act 20 and the Statewide Parcel Map Initiative

A major development for the WLIP occurred in 2013 through the state budget bill, known as Act 20. It directed the Department of Administration (DOA) to create a statewide digital parcel map in coordination with counties.

Act 20 also provided more revenue for WLIP grants, specifically for the improvement of local parcel datasets. The WLIP is dedicated to helping counties meet the goals of Act 20 and has made funding available to counties in the form of Strategic Initiative grants to be prioritized for the purposes of parcel/tax roll dataset improvement.

For Strategic Initiative grant eligibility, counties are required to apply WLIP funding toward achieving certain statewide objectives, specified in the form of "benchmarks." Benchmarks for parcel data—standards or achievement levels on data quality or completeness—were determined through a participatory planning process. Current benchmarks are detailed in the [WLIP grant application](#), as will be future benchmarks.

### WLIP Benchmarks

- Benchmark 1 & 2 – Parcel and Zoning Data Submission/Extended Parcel Attribute Set Submission
- Benchmark 3 – Completion of County Parcel Fabric
- Benchmark 4 – Completion and Integration of PLSS

More information on how Brown County is meeting these benchmarks appears in the Foundational Elements section of this plan document.

## County Land Information System History and Context

Brown County's land records system dates back to the 1800s. At that time, Brown County's surveying and real estate recordkeeping systems were among the best in the world given the technology of the time. However, over the next 150+ years, the paper-based land records system grew unwieldy, outdated, and inefficient to use. By the 1970s, there were several initiatives to "modernize" land records at all levels of government through the use of computer technology. In 1978, the Wisconsin Department of Administration, in cooperation with the University of Wisconsin, inventoried and analyzed the impediments that limited the access and use of various public records. The inefficiencies of the paper-based system were shown to lead to higher costs to taxpayers. Pressure to modernize came from within government but also from the private sector, particularly real estate professionals, engineers, surveyors, and other businesses that rely on county land records. In 1985, Governor Earl created the Wisconsin Land Records Committee (WLRC) through Executive Order #79. The WLRC developed a conceptual model for a land records modernization program and reported this to the governor in 1987.

In 1989, the Wisconsin Land Information Program was officially created through legislation. Under this program, all 72 counties were to establish a local Land Information Office (LIO) as defined in statutes 59.72 and 59.43. The funding mechanism is based on real estate document recording fees collected in the county Register of Deeds office. The Brown County Board established an LIO in 1990 by resolution.

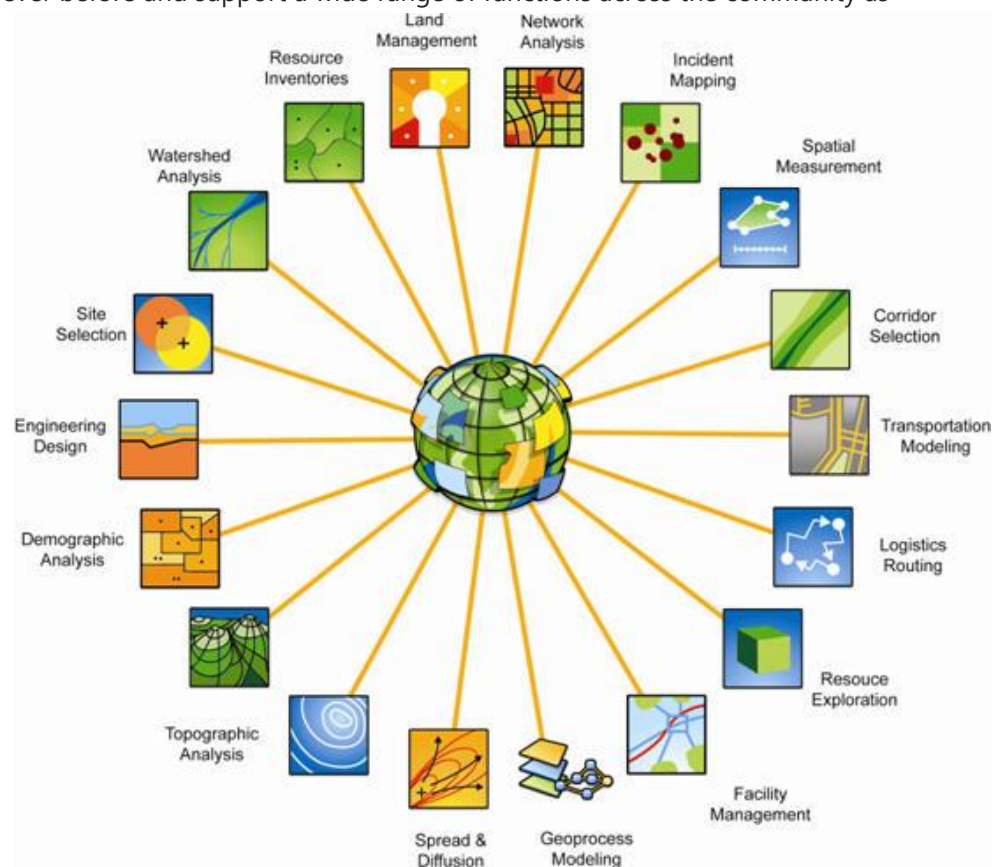
Since 1990, Brown County has succeeded in many land records modernization efforts including electronic real estate document management, digital parcel mapping, GIS implementation, and providing internet access to records. All of these efforts were guided by strategic planning efforts through the Brown County Land Information Office Committee (now called the Land Information Council) while being supported by County Executives and Boards.

The success of the Land Information Program is significant and measurable. Today, accurate digital land records are more easily accessible than ever before and support a wide range of functions across the community as depicted on the graphic below.

By leveraging modern technology, the Land Information Program has vastly improved upon Wisconsin's rich tradition in openness in government by giving businesses and citizens the means to view open records from the comfort of their home or office using internet technology.

Users can run database queries on a centralized up-to-date computer database, thus shortening the time spent searching.

Today, many systems are highly dependent on land information and GIS is deeply integrated into these systems.



**Figure 1: How GIS is used (credit: Esri)**



## County Land Information Plan Process

County land information plans were initially updated every five years. However, as a result of Act 20, counties must update and submit their plans to DOA for approval every three years. The 2019-2021 plan, completed at the end of 2018, is the second post-Act 20 required update.

### Plan Participants and Contact Information

Another requirement for participation in the WLIP is the county land information council, established by legislation in 2010. The council is tasked with reviewing the priorities, needs, policies, and expenditures of a land information office and advising the county on matters affecting that office.

According to s. 59.72(3m), Wis. Stats., the county land information council is to include:

- Register of Deeds
- Treasurer
- Real Property Lister or designee
- Member of the county board
- Representative of the land information office
- A realtor or member of the Realtors Association employed within the county
- A public safety or emergency communications representative employed within the county
- County surveyor or a registered professional land surveyor employed within the county
- Other members of the board or public that the board designates

The land information council must have a role in the development of the county land information plan, and DOA requires county land information councils to approve final plans.

This plan was prepared by the county LIO, the Brown County Land Information Council, and others as listed below.

\* Land Information Council Members designated by asterisk and **bold font**

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# 2 FOUNDATIONAL ELEMENTS

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Counties must have a land information plan that addresses development of specific datasets or map layer groupings historically referred to as the WLIP **Foundational Elements**. Foundational Elements incorporate nationally-recognized “Framework Data” elements, the major map data themes that serve as the backbone required to conduct most mapping and geospatial analysis.

In the past, Foundational Elements were selected by the former Wisconsin Land Information Board under the guiding idea that program success is dependent upon a focus for program activities. Thus, this plan places priority on certain elements, which must be addressed in order for a county land information plan to be approved. Beyond the county’s use for planning purposes, Foundational Element information is of value to state agencies and the WLIP to understand progress in completion and maintenance of these key map data layers.

Beyond Brown County’s use for planning purposes, the “Foundational Elements” listed here are valuable to state agencies and others looking to see the status of common GIS layers used throughout the state. The layers listed in this section are those “key map layers” identified in the Wisconsin Land Information Program statutes and guidelines. This list is not a comprehensive list of all land information or GIS datasets available in Brown County. There are many other datasets that have been produced for various county and other local projects. This Foundational Elements listed below are focused on the key layers that were identified by the WLIP.

## FOUNDATIONAL ELEMENTS

- PLSS
- Parcel Mapping
- LiDAR and Other Elevation Data
- Orthoimagery
- Address Points and Street Centerlines
- Land Use
- Zoning
- Administrative Boundaries
- Other Layers

# PLSS

## Public Land Survey System Monuments

### Layer Status

#### PLSS Layer Status

	Status/Comments
Number of PLSS corners (selection, ¼, meander) <b>set in original government survey</b> that can be remonumented in your county	<ul style="list-style-type: none"> <li>3036. This number had been higher in previous reports, however, it has been determined that some corners are not considered original.</li> </ul>
Number and percent of PLSS corners capable of being remonumented in your county that <b>have been remonumented</b>	<ul style="list-style-type: none"> <li>2355 (78%)</li> </ul>
Number and percent of remonumented PLSS corners with survey grade coordinates (see below for definition) <ul style="list-style-type: none"> <li><b>SURVEY GRADE</b> – coordinates collected under the direction of a Professional Land Surveyor, in a coordinate system allowed by 236.18(2), and obtained by means, methods and equipment capable of repeatable 2 centimeter or better precision</li> <li><b>SUB-METER</b> – point precision of 1 meter or better</li> <li><b>APPROXIMATE</b> – point precision within 5 meters or coordinates derived from public records or other relevant information</li> </ul>	<ul style="list-style-type: none"> <li>100% of the remonumented corners have survey grade coordinates.</li> </ul>
Number and percent of survey grade PLSS corners integrated into county digital parcel layer	<ul style="list-style-type: none"> <li>100% of the remonumented corners are integrated into the digital parcel layer.</li> </ul>
Number and percent of non-survey grade PLSS corners integrated into county digital parcel layer	<ul style="list-style-type: none"> <li>n/a</li> </ul>
Tie sheets available online?	<ul style="list-style-type: none"> <li>Yes <input type="text" value="Survey Index &amp; Tie Sheet Viewer app (click here)"/></li> </ul>
Percentage of remonumented PLSS corners that have <b>tie sheets available online</b> (whether or not they have corresponding coordinate values)	<ul style="list-style-type: none"> <li>100% of the remonumented corners have tie sheets available on the above-noted Survey Index &amp; Tie Sheet Viewer GIS app.</li> </ul>
Percentage of remonumented PLSS corners that have tie sheets available online (whether or not they have corresponding coordinate values) <b>and a corresponding URL path/hyperlink value</b> in the PLSS geodatabase	<ul style="list-style-type: none"> <li>100%</li> </ul>
PLSS corners believed to be remonumented based on filed tie-sheets or surveys, but do not have coordinate values	<ul style="list-style-type: none"> <li>0 (none)</li> </ul>
Approximate number of PLSS corners believed to be lost or obliterated	<ul style="list-style-type: none"> <li>681</li> </ul>
Which system(s) for <b>corner point identification/ numbering</b> does the county employ (e.g., the Romportl point numbering system known as Wisconsin Corner Point Identification System, the BLM Point ID Standard, or other corner point ID system)?	<ul style="list-style-type: none"> <li>Brown County uses a unique corner ID system. The above-mentioned Tie Sheet Viewer online GIS app shows corner names; If more information is needed, a grid map can be provided upon request.</li> </ul>
Does the county contain any <b>non-PLSS areas</b> (e.g., river frontage long lots, French land claims, private claims, farm lots, French long lots, etc.) or any special situations regarding PLSS data for tribal lands?	<ul style="list-style-type: none"> <li>Yes. Private Claims, Indian Claims, Oneida Reservation Lots, Williams Grant, and the Fort Howard Military Reserve areas all use non-PLSS tract descriptions. The LIO web site includes a breakdown and map of each.</li> </ul>
Total number of PLSS corners along each bordering county	<ul style="list-style-type: none"> <li>243</li> </ul>
Number and percent of PLSS corners remonumented along each county boundary	<ul style="list-style-type: none"> <li>227 (93%). The corners not remonumented along the county boundary are mostly the 1/16<sup>th</sup> corners through the Oneida Indian Reservation.</li> </ul>
Number and percent of remonumented PLSS corners along each county boundary with survey grade coordinates	<ul style="list-style-type: none"> <li>All of them (100%).</li> </ul>
In what ways does your county collaborate with or plan to collaborate with neighboring counties for PLSS updates on shared county borders?	<ul style="list-style-type: none"> <li>The Brown County Surveyor contacts the adjacent counties if there are issues or questions. Updated tie sheets are sent after corner maintenance is completed.</li> </ul>

### Custodian

- Brown County Planning & Land Services Department / Surveyor's Office (County Surveyor)

### Maintenance

- PLSS records are updated daily or as needed. Tie sheet PDFs include historical information.

### Standards

- Statutory Standards for PLSS Corner Remonumentation

- s. 59.74, Wis. Stats. Perpetuation of section corners, landmarks.
- s. 60.84, Wis. Stats. Monuments.
- ch. A-E 7.08, Wis. Admin. Code, U.S. public land survey monument record.
- ch. A-E 7.06, Wis. Admin. Code, Measurements.
- s. 236.15, Wis. Stats. Surveying requirement.
- SURVEY GRADE standard from Wisconsin County Surveyor’s Association:
  - **SURVEY GRADE** – coordinates collected under the direction of a Professional Land Surveyor, in a coordinate system allowed by 236.18(2), and obtained by means, methods and equipment capable of repeatable 2 centimeter or better precision
  - **SUB-METER** – point precision of 1 meter or better
  - **APPROXIMATE** – point precision within 5 meters or coordinates derived from public records or other relevant information
- Brown County uses the Survey Grade standard for all PLSS corner work.

## Other Geodetic Control and Control Networks

e.g., HARN, Height Mod., etc.

### Layer Status

- With assistance of the WiDOT, municipalities, and private companies, Brown County has developed and densified a HARN (High Accuracy Reference Network) using Federal Geodetic Control Subcommittee guidelines. National Geodetic Survey monuments are also present.

### Custodian

- Brown County is not the custodian of the HARN or NGS monuments.

### Maintenance

- Brown County is not responsible for the maintenance of the HARN or NGS monuments.

### Standards

- Four Primary Stations (1 ppm), 36 Secondary (2 ppm) and over 50 Tertiary (10ppm) stations have been established in Brown County. A Vertical Geodetic Control Network is also in place, and it is based on the National Spatial Reference System. All 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> order NGS monuments have been recovered; GPS coordinates and elevations have been captured on more than 170 of these.

## Parcel Mapping

### Parcel Geometries

#### Layer Status

- **Progress toward completion/maintenance phase:** County-wide parcel layer is 100% complete in Brown County, and all of the county’s parcels are available in a digital CAD and GIS format. As of September 2018, there are 102,498 tax parcels in Brown County. Parcels boundary lines are drafted using coordinate geometry in AutoCAD as referenced to its source document, professionally analyzed, and precisely mapped into a geodetic controlled PLSS base. The parcel map layer is maintained using both AutoCAD and ArcGIS.
- **Projection and coordinate system:** Transverse Mercator, NAD 1983 HARN WISCRS: Brown County, Feet
- **Integration of tax data with parcel polygons:** Brown County has a parcel polygon GIS model that directly integrates tax/assessment data as parcel attributes.
- **Esri Parcel Fabric/LGIM Data Model:** Brown County does not use the Esri Parcel Fabric Data Model, or Esri’s Local Government Information Model. However, the Parcel Fabric will be evaluated in the next three years.
- **Online Parcel Viewer Software/App and Vendor name:** Brown County uses Esri’s Web AppBuilder to publish parcels and other GIS data online. The site is named “BrownDog” and is available by [clicking here](#).

- **Unique URL path for each parcel record:** Yes. The URL is stable and includes assessment data, information on recorded documents, and more. Later in 2018, after Brown County converts our Tax System to GCS Software, more information will be available.

#### Custodian

- Brown County Planning & Land Services Department / Property Listing Division

#### Maintenance

- **Update Frequency/Cycle.** Parcel maps including polygons are updated daily as needed.
- The latest information is published online about 3 times per week.

#### Standards

- **Data Dictionary:**
- Detailed metadata is embedded in the GeoDatabase feature datasets. Additionally, a data dictionary is available in PDF format online. A data dictionary is available for each element/attribute name, and explanations of any county-specific notations for parcel attributes listed by s. 59.72(2)(a).
- Parcel mapping meets National Map Accuracy Standards for 1" = 50' scale.
- Brown County meets the standards set forth by the statewide parcel mapping project;

## Assessment/Tax Roll Data

#### Layer Status

- **Progress toward completion/maintenance phase:** N/A. Brown County maintains tax roll data throughout the year.
- **Tax Roll Software/App and Vendor name:** In 2019, Brown County will switch from an in-house custom AS/400 system to the GCS Software system (LandNav).
- **Municipal Notes:** N/A. Brown County does tax listing for the entire county.

#### Custodian

- Brown County Planning & Land Services Department / Property Listing Division.

#### Maintenance

- **Maintenance of the Searchable Format standard:** To maintain the Searchable Format standard, the county will use GCS Software's exporting tool to produce a copy of the data in the Searchable Format standard.
- **Searchable Format Workflow:** The county maintains parcel/tax roll data in way that differs from the state standard, but a third-party export tool (provided by GCS Software) makes it possible to produce the Searchable Format with little human labor.

#### Standards

- Wisconsin Department of Revenue [Property Assessment Manual](#) and attendant DOR standards
- DOR XML format standard requested by DOR for assessment/tax roll data will be met after conversion to GCS Software's product is complete (late 2018)

## Non-Assessment/Tax Information Tied to Parcels

e.g., **Permits, Easements, Non-Metallic Mining, Brownfields, Restrictive Covenants**

#### Layer Status

- Brown County ties the following datasets to parcels via GIS and/or Parcel ID:
  - Shoreland Permits
  - POWTS (Private Onsite Waste Treatment Systems)
  - Agricultural field units
  - Non-metallic mining sites
  - Surveys (link to survey index)
  - Real estate documents (via Tapestry)
  - Municipal information (zoning, web sites, administrators)
  - Google Street View imagery

### Custodians

- Brown County Planning & Land Services / Zoning Division
- Brown County Land & Water Conservation Department

### Maintenance

- As Needed

### Standards

- Mapping tied to parcels generally follows the same accuracy standards as the parcel dataset (NMAAS 1" = 50').

## ROD Real Estate Document Indexing and Imaging

### Layer Status

- **Grantor/Grantee Index:** Digitized grantor/grantee index November 21, 1980. In progress: 1962 to November 20, 1980. Prior to 1962, paper index stored off-site and available upon request.
- **Tract Index:** Official Tract Index is Private Claim and PLSS based – digitized January 1, 1989. Prior to January 1, 1989 paper based Tract Index available in the Register of Deeds Office. 75 years after Official Tract Index started another tract index system was created in Brown County called Abstract Listing. Like the official Tract Index, it is Private Claim and PLSS based. Tracts were merged on June 1, 1995 and Abstract Listing books closed. All paper Abstract books were digitized and imported into Register of Deeds Tract Index system for searching on November 21, 2006.
- **Imaging:** TIFF images for documents from May 1, 1989 forward are linked to index and available online through subscription service. TIFF images from 1962 to April 30, 1989 in production to be linked to index and document number. Prior to 1962 images are on microfiche and available in the Register of Deeds office only.
- **ROD Software/App and Vendor Name:** Laredo/Tapestry from Fidar Technologies.
- **Survey Index:** The Brown County GIS system includes a map layer depicting the area boundaries of all plats, certified survey maps, plat of surveys, transportation plats, and miscellaneous surveys. The GIS layer includes attributes that allow for map searches and the attributes include surveyor name, date of survey, and linkage to scanned survey image.

### Custodian

- County Register of Deeds

### Maintenance

- Daily updates. Off-site data replication (Index and Images) from 1962 forward. Remote searchers access replicated data base

### Standards

- s. 59.43, Wis. Stats. Register of deeds; duties, fees, deputies.
- ch. 706, Wis. Stats. Conveyances of real property; Recording; Titles.

## LiDAR and Other Elevation Data

### LiDAR

#### Layer Status

- **Most recent acquisition year:** 2010
- **Accuracy:** The Brown County Surveyor checked the accuracy of our delivered product by making GNSS observations on over 93 photo-identifiable points. These observations showed the product had an RMSE of 0.207(z) for an NSSDA accuracy of 0.405 feet (z)
- **Post spacing:** Approximately 3.9 feet
- **Contractor's standard, etc.:** Quality Assurance procedures conducted by the Brown County Surveyor showed the LiDAR data exceeded the spatial accuracy set forth in project specifications: Tests showed an RMSE<sub>z</sub> of 0.21 feet and an NSSDA Accuracy of 0.41 feet.
- **Next planned acquisition year:** 2020 if funding can be acquired.

### Custodian

- Brown County Planning & Land Services Department / Land Information Office.

### Maintenance

- These data are housed on the internal GIS server and made available through the LIO Data Downloads page.

### Standards

- Exceeds standards for 2-foot contour mapping (tests showed an RMSE<sub>z</sub> of 0.21 feet and an NSSDA Accuracy of 0.41 feet, which is nearly sufficient for 1-foot contour generation).

## LiDAR Derivatives

e.g., Bare-Earth Digital Terrain Model (DTM), Bare-Earth Elevation Contours, Bare-Earth Digital Elevation Model (DEM), Digital Surface Model (DSM), etc.

### Layer Status

The 2010 LiDAR dataset has been used to create:

- Hydro-flattened DEM (per FEMA standards for flood mapping)
- Terrain model
- Two-foot contours in GeoDatabase, shapefile, and AutoCAD DWG formats
- Brown County's LiDAR dataset was NOT in place when FEMA last published countywide flood mapping in 2008-09.
- **Online viewing:** Many web applications include these data layers including the Multi-Purpose GIS app
- **Downloading data** is possible from the LIO web site (various formats)

### Custodian

- Brown County Planning & Land Services Department / Land Information Office.

### Maintenance

- These data are maintained on the internal GIS server and made available through the LIO Data Downloads page.

### Standards

- Quality Assurance procedures conducted by the Brown County Surveyor showed the LiDAR data exceeded the spatial accuracy set forth in project specifications: Tests showed an RMSE<sub>z</sub> of 0.21 feet and an NSSDA Accuracy of 0.41 feet.

## Other Types of Elevation Data

### Layer Status

- In addition to the 2010 LiDAR data & its derivatives, Brown County has two-foot contour data from April 2000. This was based on aerial photography and produced using photogrammetric mapping techniques. The 2000 dataset does not cover the entire county.

### Custodian

- Brown County Planning & Land Services Department / Land Information Office

### Maintenance

- All previous elevation datasets are maintained on the county's internal GIS server

### Standards

- This dataset was found to have inaccuracies, and although the contractor re-mapped parts of it, this dataset has not been deemed to meet the two-foot accuracy standards in all areas.



# Orthoimagery

## Orthoimagery

### Layer Status

- **Most recent acquisition year:** 2017
- **Resolution:** 6 inches
- **Online viewing:** Orthoimagery can be viewed on the [BrownDog GIS app](#)
- **Downloading data** is possible via the [LIO web site](#) (TIF or SID formats)
- **Next planned acquisition year:** 2020
- **WROC participation in 2020:** Brown County will provide imagery to WROC in 2020 if a flight is completed, regardless of vendor. Brown County chooses qualified vendors based on an RFP or bid process. The WROC vendor proposal may or may not be selected based on price or other criteria.

### Custodian

- Brown County Land Planning & Land Services Department / Land Information Office

### Maintenance

- All imagery is maintained on the GIS server and made available to internal and public users.
- This dataset is available for download as TIF and SID format on the Brown County Land Information web site.
- Brown County plans to produce high-resolution photos every 3 years pending sufficient budget.

### Standards

- Orthoimagery from 2000, 2005, 2010, 2014, and 2017 were completed with a 6" ground resolution and tested to ensure they meet National Map Accuracy Standards (NMAS) for 1" = 100' mapping (NSSDA Accuracy is 1.73' or better).

## Historic Orthoimagery

### Layer Status

- Brown County has contracted to produce historic orthoimagery for several years including 1938, 1960, 1978 and 1992 (in addition to the imagery from 2000, 2005, 2010, 2014, and 2017).
- **Online viewing:** Historic orthoimagery can be viewed on the [BrownDog GIS app](#)
- **Downloading data** is possible for some datasets via the [LIO web site](#) (TIF or SID formats)

### Custodian

- Brown County Planning & Land Services Department/ Land Information Office

### Maintenance

- All historic imagery is maintained on the GIS server where it can easily be called up to serve as a historic base map to view land use changes over time. Historic images can be viewed and compared as overlays using the Brown County Land Information web apps including the [BrownDog](#).

### Standards

- The older aerial orthophotos have inconsistent mapping accuracy across the image, but generally the historic images meet National Map Accuracy Standards for 1" = 200' mapping for the older images (1938, 1960, 1978, and 1992) and 1" = 100' for the images from 2000 and after.

## Other Types of Imagery

e.g., [Oblique Imagery](#), [Satellite Imagery](#), [Infra-red](#), etc.

### Layer Status

- Brown County has not contracted for oblique imagery, but both oblique and street view imagery has been produced by Google and Microsoft for most of the county and is accessible through web links on the county's GIS.
- The 2014 and 2017 TIF images include a 4<sup>th</sup> band (near infrared).

### Custodian

- Brown County Planning & Land Services Department: Land Information Office (LIO)

### Maintenance

- Future flights will include the near infrared band because this is useful for certain activities such as wetland delineation.

### Standards

- Accuracy and other standards vary for each dataset but generally meet NMAS for 1" = 100' mapping

## Address Points and Street Centerlines

### Address Point Data

#### Layer Status

- 100% complete.

#### Custodians

- Brown County Municipalities (assign address numbers)
- Brown County Planning & Land Services Department / Planning Division
- Brown County Planning & Land Services Department / Property Listing Division
- Brown County Planning & Land Services Department / Land Information Office
- Brown County Public Safety Communications Department (assign 911 attributes)

#### Maintenance

- Address points are updated daily or as needed by Planning & Land Services Staff and by Public Safety Communications staff using a versioned SDE GeoDatabase and ArcGIS Desktop.

#### Standards

- Address points are placed on buildings for residences and near entrances of larger commercial and retail buildings using aerial orthophotos having National Map Accuracy Standards (NMAS) for 1" = 100' mapping.

### Building Footprints

#### Layer Status

- About 70% complete. Most of the urbanized areas have contracted to have building footprints produced from the 2010, 2014, and/or 2017 aerial imagery and Brown County has compiled these footprints into the county GIS database. Additionally, Brown County incorporated free, downloadable buildings created by Microsoft for much of the rest of the county.
- **Online viewing:** Building footprints can be viewed online with the [BrownDog GIS app](#).

#### Custodian

- Municipalities within Brown County; also the county Planning & Land Services Department

#### Maintenance

- Updated based on new aerial photography as needed or as time permits.

#### Standards

- The goal is for all buildings to meet National Map Accuracy Standards (NMAS) for 1" = 100' mapping

### Other Types of Address Information

#### e.g., Address Ranges

#### Layer Status

- Address ranges on street centerlines are 100% complete

#### Custodian

- Brown County Planning & Land Services Department / Land Information Office

#### Maintenance

- Address ranges on street centerlines are updated by Planning & Land Services staff as needed

## Standards

- Street Centerlines meet National Map Accuracy Standards (NMAS) for 1" = 100' mapping

## Street Centerlines

### Layer Status

- Street centerlines are mapped countywide. Each segment includes about 30 attributes that support the Brown County NG911 system, Metropolitan Planning Organization (MPO), and Public Works/Highway.
- Streets include annotation. Mile markers are mapped on all freeways.
- **Online viewing:** Street centerlines can be viewed online with the [BrownDog GIS app](#)

### Custodian

- Brown County Planning & Land Services Department / Planning Division
- Brown County Planning & Land Services Department / Land Information Office

### Maintenance

- Street Centerlines are updated by Planning & Land Services staff as needed using a versioned SDE GeoDatabase and ArcGIS Desktop

### Standards

- Street Centerline database schema is similar to that used by other counties and Esri. The centerline mapping meets National Map Accuracy Standards (NMAS) for 1" = 100' mapping

## Rights of Way

### Layer Status

- Complete; in maintenance phase, updated as needed. This data is maintained as lines within our CAD parcel dataset as well as our GIS parcel line feature class. Lines have layer codes that allow users to filter the right of way lines from the rest of the parcel line work.
- **Online viewing:** Road and railroad right of ways can be viewed online with the [BrownDog GIS app](#)

### Custodian

- Brown County Planning & Land Services Department / Property Listing Division maintains this data in AutoCAD and also using a versioned SDE GeoDatabase and ArcMap

### Maintenance

- Brown County Property Listing updates this layer daily or as needed.

### Standards

- Horizontal accuracy standard: Meets National Map Accuracy Standards (NMAS) for 1" = 50' mapping.

## Trails & Sidewalks

### e.g., Recreational Trails

### Layer Status

- Almost 100% complete. Brown County Planning & Land Services Department / Planning Division has mapped all known trails and sidewalks in the county.
- Trail mile markers are maintained on the major trails (Fox River State Trail, East River Trail, etc)
- **Online viewing:** These can be viewed online with the [BrownDog GIS app](#)

### Custodian

- Brown County Planning & Land Services Department / Planning Division

### Maintenance

- Updated as needed, usually in conjunction with new aerial orthophotography.

### Standards

- Mapping meets National Map Accuracy Standards (NMAS) for 1" = 100' maps

## Land Use

### Current Land Use

#### Layer Status

- Mostly complete but in need of updates. Brown County's last full land use inventory was completed in 2014 and is again being revised in 2018. Aerial orthophotography is used to update land use.

#### Custodian

- Brown County Planning & Land Services Department / Planning Division.

#### Maintenance

- Updated as needed, usually in conjunction with new aerial photography or when Brown County is updating land use plans. A new county comprehensive plan will be developed in 2019 and the land use will be updated using 2017 aerials.

#### Standards

- Land Use is coded based on the Bay-Lake Regional Planning Commission classification system
- Land use mapping meets National Map Accuracy Standards (NMAS) for 1" = 100' maps

### Future Land Use

#### Layer Status

- This layer was last completed countywide in 2007. It has not been updated since, though we plan to update this layer as part of our county comprehensive plan update in 2019.

#### Custodian

- Brown County Planning & Land Services Department / Planning Division

#### Maintenance

- Updated as needed.

#### Standards

- s. 66.1001, Wis. Stats. Comprehensive planning.

## Zoning

### County General Zoning

#### Layer Status

- Not administered by Brown County.

### Shoreland Zoning and POWTS (Private Onsite Waste Treatment Systems)

#### Layer Status

- Complete; in maintenance phase, updated as needed.
- **Online viewing:** Shoreland Zoning & POWTS layers can be viewed online with the [BrownDog GIS app](#)

#### Custodians

- Brown County Planning & Land Services Department / Zoning Division
- Brown County Planning & Land Services Department / Land Information Office

#### Maintenance

- This data layer is updated as needed. Changes can occur with new navigability determinations, FEMA flood map revisions, and DNR wetland changes. Data managed using a versioned SDE GeoDatabase and ArcGIS Desktop.

#### Standards

- Wisconsin NR115 and NR116 and Chapters 22 and 23 of the Brown County Code

## Farmland Preservation Zoning

### Layer Status

- The County does maintain a GIS representation of county farmland preservation boundaries.
- **Year of certification:** 2017

### Custodians

- Brown County Planning & Land Services Department
- Brown County Land & Water Conservation Department

### Maintenance

- Map layers are updated as needed.

### Standards

- Wisconsin Working Lands Initiative (Wis. Statutes chapter 91).

## Floodplain Zoning

### Layer Status

- The County does maintain a GIS representation of floodplain zoning boundaries.
- The county's floodplain zoning GIS data is not the same as/identical to the FEMA map, the one difference being we include polygon outlines showing LOMA/R (Letter of Map Amendment/Revision).
- Limited Boundary Adjustment/Fill in Flood Fringe; Letters of Map Change

### Custodians

- Brown County Planning & Land Services Department / Zoning Division
- Brown County Planning & Land Services Department / Land Information Office

### Maintenance

- Letters of Map Change are maintained in the GIS database and the area affected is shown on the BrownDog online GIS map.

### Standards

- Chapters 22 and 23 of the Brown County Code

## Airport Protection

### Layer Status

- The County does maintain a GIS representation of airport protection zoning boundaries
- **Airport protection zoning map depicts:** Height limitation restrictions and general zoning overlay for airport protection.
- **Online viewing:** Airport zoning can be viewed online with the BrownDog GIS app

### Custodians

- Austin Straubel International Airport
- Brown County Planning & Land Services staff assists with the mapping/GIS components.

### Maintenance

- This dataset is updated as needed.

### Standards

- Brown County Zoning Ch. 24 Ordinance

## Municipal Zoning Information Maintained by the County

e.g., Town, City and Village, Shoreland, Floodplain, Airport Protection, Extra-Territorial, Temporary Zoning for Annexed Territory, and/or Zoning Pursuant to a Cooperative Plan

### Layer Status

- Brown County has assisted many of the smaller towns with zoning map production in GIS format. We have also received copies of municipal zoning from other municipalities for use within certain projects; However, as we are not often privy to changes, the county's zoning map cannot be relied on as current.
- The LIO indexed all municipal zoning web pages and maps within ArcGIS Online:  
<http://browncounty.maps.arcgis.com/home/search.html?q=zoning&t=content&content=all>

### Custodian

- Brown County Municipalities

### Maintenance

- Brown County will maintain municipal zoning data if provided by the municipality or if the county has agreed to assist the municipality with zoning map updates.

### Standards

- Mapping accuracy standards: Zoning is usually based on parcel mapping, 1" = 50' NMAPS.

## Administrative Boundaries

### Civil Division Boundaries

e.g., Towns, City, Villages, etc.

#### Layer Status

- 100% complete

#### Custodians

- Brown County Planning & Land Services Department / Property Listing Division
- Brown County Planning & Land Services Department / Land Information Office

#### Maintenance

- Updated as needed

#### Standards

- Mapping meets National Map Accuracy Standards (NMAPS) for 1" = 100' mapping

### School Districts

#### Layer Status

- **Progress toward completion/maintenance phase:** School Districts are mapped; 100% complete.
- **Relation to parcels:** Parcel attributes include a school district code
  - **Attributes linked to parcels:** School District ID
- **Online viewing:** School Districts can be viewed online with the [BrownDog GIS app](#)

#### Custodians

- Brown County Planning & Land Services Department / Property Listing Division
- Brown County Planning & Land Services Department / Land Information Office

#### Maintenance

- Updated as needed

#### Standards

- Map layer meets National Map Accuracy Standards (NMAPS) for 1" = 100' mapping

### Election Boundaries

e.g., Voting Districts, Precincts, Wards, Polling Places, etc.

#### Layer Status

- Wards and County Supervisor Districts are mapped as a GIS layer (100% complete).
- **Online viewing:** Districts & Wards can be viewed online with the [BrownDog GIS app](#)

### Custodian

- Brown County Clerk's Office
- Planning & Land Services Department

### Maintenance

- Updates are made to boundaries during the Redistricting process.
- Annexations can trigger other changes to wards and districts; the district changes are gathered from resolutions filed in the County Clerk's office and updated on the GIS map using a versioned SDE GeoDatabase and ArcGIS Desktop.

### Standards

- National Map Accuracy Standards (NMAS) for 1" = 100' mapping

## Utility Districts

e.g., Water, Sanitary, Electric, etc.

### Layer Status

- Sanitary Districts and Sewer Service Area boundaries are mapped in GIS format (100% complete).
- **Online viewing:** Sanitary Districts and Sewer Service Areas (SSAs) can be viewed online with the [BrownDog GIS app](#)

### Custodian

- Brown County Planning & Land Services Department.

### Maintenance

- Updated as needed.

### Standards

- National Map Accuracy Standards (NMAS) for 1" = 100' mapping

## Public Safety

e.g., Fire/Police Districts, Emergency Service Districts, 911 Call Center Service Areas, Public Safety Answering Points, Healthcare Facilities

### Layer Status

- Fire Districts: 100% complete\*
- Fire Stations: 100% complete
- Police Districts & beats: 100% complete\*
  - \*Note: Brown County's new 911 Computer Aided Dispatch vendor (Securus Technologies) requires Fire and Police boundaries be merged into a single layer which we refer to as the "XCAD\_Grid". Each polygon within this layer is coded with fire and police agency/beat codes.
  - EMS (Emergency Medical Service) area boundaries are part of the Fire District layer.
- **Online viewing:** Public Safety layers can be viewed online with the [BrownDog GIS app](#)

### Custodians

- Brown County Planning & Land Services Department / Land Information Office
- Brown County Public Safety Communications Department

### Maintenance

- Updated as needed

### Standards

- Map layer: National Map Accuracy Standards (NMAS) for 1" = 100' mapping
- Attribute schema: Securus Technologies XCAD Computer Aided Dispatch software



## Lake Districts

### Layer Status

- Brown County does not have any Lake Districts

### Custodian

- n/a

### Maintenance

- n/a

### Standards

- n/a

## Native American Lands

### Layer Status

- 100% complete. Brown County maintains a GIS layer for the Oneida Reservation and we also track land put into Trust. Oneida "Fee Land" (parcels owned by the Oneidas but still taxed) are also tracked.

### Custodian

- Brown County Planning & Land Services Department / Property Listing Division

### Maintenance

- Parcels in trust are updated at least annually.

### Standards

- National Map Accuracy Standards (NMAS) for 1" = 100' mapping

## Other Administrative Districts

e.g., County Forest Land, Parks/Open Space, etc.

### Layer Status

- **Business & Industrial Parks:** A GIS layer is complete, and this layer contains attributes and drives an [online interactive app](#) that allow a prospective business to discover community contact phone numbers and emails, transportation facilities, and demographic profile detailing important statistics for the areas nearby.
- **Urbanized Area boundaries and MPO Plan Boundaries:** The Metropolitan Planning Organization (MPO) "Urbanized Area" boundaries are tracked through each decade and mapped as a GIS layer.
- **Park boundaries:** A GIS layer depicting parks is 100% complete, and this contains many attributes describing amenities within each park.
- **ZIP code boundaries:** A GIS layer is complete although the Post Office does change these boundaries from time to time and the county's version may not be completely up-to-date.
- **Census boundaries:** Brown County incorporates census tract and block boundaries into our local GIS system. Population data and other data are often drawn from these layers and analyzed with GIS for various projects.

### Custodian

- Brown County Planning & Land Services Department

### Maintenance

- Updated as needed

### Standards

- National Map Accuracy Standards (NMAS) for 1" = 100' mapping

## Other Layers

### Hydrography Maintained by County or Value-Added

e.g., Hydrography maintained separately from DNR or value-added, such as adjusted to orthos

#### Layer Status

- 100% complete. Brown County maintains a hydrography map layer based on high-resolution digital orthophotography and the 2010 LiDAR. The hydrography layer includes attributes that closely match those of the USGS and Wisconsin DNR. For example, the county's hydro layer links to the DNR's Surface Water Data Viewer when possible.
- Additionally, the 2010 LiDAR data have been processed using the ArcHydro tools to produce GIS layers depicting more detailed drainage and flow accumulation layers, along with revised basin and watershed boundaries. However, this project is incomplete due to a lack of a complete culvert inventory and outdated LiDAR. It is a goal to update the drainage mapping layer in the next three years.

#### Custodian

- Brown County Planning & Land Services Department
- Brown County Land & Water Conservation Department

#### Maintenance

- Updated as needed, primarily after new aerial orthophotography is acquired.

#### Standards

- Mapping: National Map Accuracy Standards (NMAS) for 1" = 100' mapping
- Attribute schema: USGS and Wisconsin DNR.

### Cell Phone Towers

#### Layer Status

- Brown County no longer maintains cell towers as a GIS layer.

#### Custodian

- n/a

#### Maintenance

- n/a

#### Standards

- n/a

### Bridges and Culverts

#### Layer Status

- Bridges on county and state highways have been inventoried as a GIS layer by Brown County Public Works
- Culverts are approximately 40% mapped. Culvert inventories from various municipalities and those collected by Brown County Land & Water Conservation Department have been merged into a countywide layer; However, most of these are in the eastern half of Brown County as of September 2018. Culverts are a critical component of hydrologic modeling, and it is a goal to complete basic culvert mapping countywide in the next three years.

#### Custodians

- Brown County Public Works Department
- Municipalities within Brown County
- Brown County Land & Water Conservation Department
- Brown County Planning & Land Services Department

#### Maintenance

- Will be updated as needed.

## Standards

- National Map Accuracy Standards (NMAS) for 1" = 100' mapping

## Other

e.g., Pipelines, Railroads, Non-Metallic Mining, Sinkholes, Manure Storage Facilities, etc.

### Layer Status

- Railroads and spurs are 100% complete as a GIS map layer
- Port facilities are 100% complete as a GIS map layer.
- Non-metallic mines will have a more complete inventory completed in 2019.
- Agricultural fields are mapped as a GIS layer
- Snowmobile trails are maintained as a GIS layer and are available for viewing online

### Custodian

- Brown County Planning & Land Services Department
- Brown County Land & Water Conservation Department
- Brown County Parks Department

### Maintenance

- Each layer is updated as needed or as time permits.

### Standards

- Standards may vary for each layer, but generally the mapped information is based on parcels and/or high-resolution aerial photography which meet National Map Accuracy Standards (NMAS) for 1" = 100' mapping.

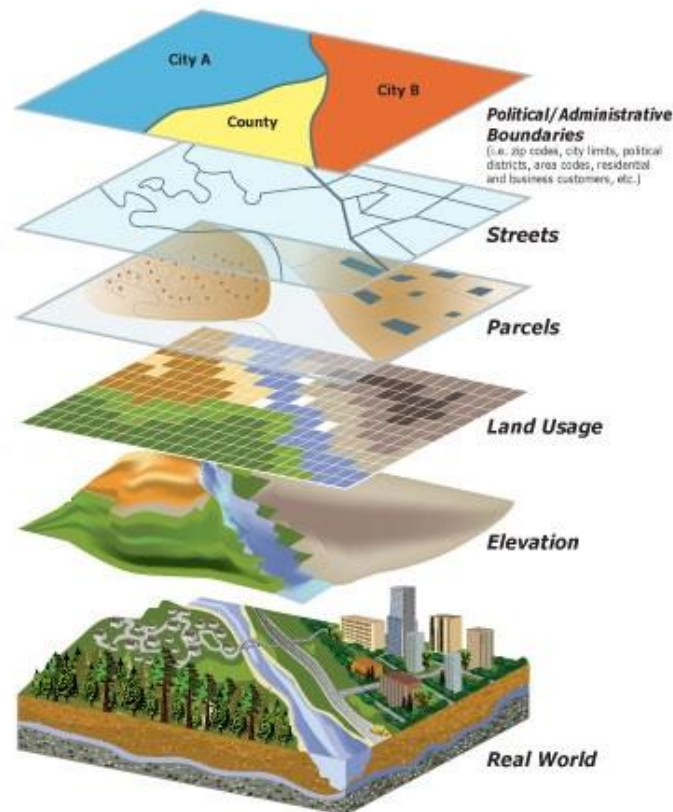


Figure 2. Conceptual diagram of GIS map layers. Image courtesy of Esri

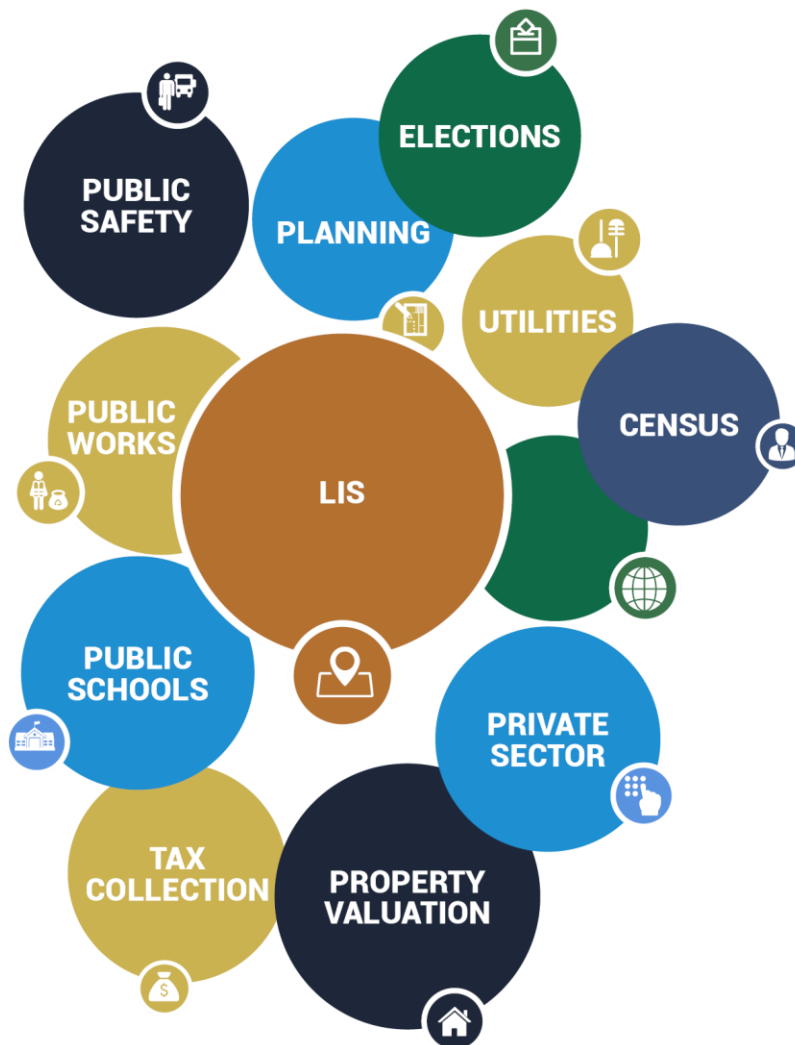
# 3 LAND INFORMATION SYSTEM

The WLIP seeks to enable land information systems that are both modernized and integrated. Integration entails the coordination of land records to ensure that land information can be shared, distributed, and used within and between government at all levels, the private sector, and citizens.

One integration requirement is listed under s. 16.967(7)(a)(1), Wis. Stats., which states that counties may apply for grants for:

- The design, development, and implementation of a land information system that contains and integrates, at a minimum, property and ownership records with boundary information, including a parcel identifier referenced to the U.S. public land survey; tax and assessment information; soil surveys, if available; wetlands identified by the department of natural resources; a modern geodetic reference system; current zoning restrictions; and restrictive covenants.

This chapter describes the design of the county land information system, with focus on how data related to land features and data describing land rights are integrated and made publicly available.



*Land Information System Stakeholders and Funding Mechanisms*

**Figure 3: A Land Information System concept diagram** (courtesy of Geospatial World)



# Current Land Information System

## Examples of Brown County Land Information System services provided to customers

<b>Land Information Office / GIS</b>	<b>Public Safety &amp; Communications</b>	Provide E-911 Computer Aided Dispatch Support: The LIO maintains addresses, streets, response agency GIS data layers and sends these to 911 monthly ("Geo" refreshes). Also support Advanced Tactical Mapping and incident "pin" mapping.
	<b>Sheriff</b>	Provide street, address, beat, map coordinates and other data for the Records Management System. GIS data is fed through Public Safety & Communications to help with the "lay of the land" during emergency calls and tactical situations.
	<b>Emergency Management</b>	Provide GIS tools, support, and data layers for emergency operations and analysis hazardous storage sites, critical infrastructure, emergency shelters, evacuation routes, Emergency Operation Center support, vulnerability zones, Grid map books.
	<b>Highway</b>	Provide support for road projects. GIS layers like elevation mapping and aerial photography helps with planning, preliminary road engineering, cut & fill analysis, stormwater management, permit location, and many other aspects of highway maintenance
	<b>Planning</b>	Provide GIS tools to reduce staff time in research, communicate effectively, perform "what ifs". Planning staff utilizes GIS frequently throughout the day to look up information on properties such as land ownership, land use, environmental data, transportation information
	<b>Property Listing</b>	The Property Listing office provides the foundational base for the GIS and the LIO works very closely with them. The LIO provides GIS training, tools and database administration for parcel mapping and integrates assessment, land ownership, and tax data with the mapping.
	<b>Zoning</b>	Provide GIS data layers to support statutory program administration Sanitary, Nonmetallic Mining, Floodplain Ordinance Administration necessitates constant use of GIS to gather information on any particular property. GIS helps save a lot of staff
	<b>Register of Deeds</b>	Provide GIS training and tools including several GIS terminals in the Register of Deeds office to help staff with tract indexing, property lookup, customer assistance and other ROD functions.
	<b>District Attorney</b>	Provide maps for court displays. The LIO routinely produces large custom maps for the district attorney and other lawyers to help analyze crime scenes and assist juries with visualizing them.
	<b>Land Conservation</b>	Provide GIS tools and maintain data layers. The LIO assists with Agricultural field "Best Management Practices" permits,, manure storage and spreading maps, water flow modeling, invasive species mapping, and geologic mapping
	<b>Clerk</b>	Provided Polling Place - Address lookup site, and also maintains maps for Supervisory Districts and Voting Wards. Provide Reapportionment services and ad hoc requests.
	<b>Treasurer</b>	Provide GIS terminals and tools for Treasurer staff. Facilitate the Property Search web site. Produce the County Plat Book. Link tax records to parcel mapping. Assist with district mapping
	<b>Health Dept</b>	Provide GIS web site to enable efficient lookup of addresses & businesses in conjunction with inspection zones.
	<b>Facilities &amp; Parks</b>	Create and maintain park maps, trail maps. Assist with park plans and facility inventory.
	<b>Airport</b>	Create & maintain airport zoning GIS layer. Assist with locating and reporting map coordinates and elevations for the FAA.
	<b>Port</b>	Create and maintain port facility maps. Assist with bathymetric (water depth) maps, dredge estimation for the Fox River and Bay of Green Bay shipping channel.
	<b>Administration</b>	The LIO provides ad hoc maps and analysis to support various tasks and projects as requested by the county's Executive, Administration, Information Services, and other administrators.

Continued on the next page: LIO services provided to external customers (business, citizens and other units of government)



<b>Land Information Office / GIS</b>	<b>Citizens</b>	The LIO serves many requests for land information maps and analysis. Most people (about 500 per day) help themselves to land information using the County's internet sites but many special requests for maps and services also come in via phone calls, emails and walk-ins
	<b>Engineers</b>	The LIO regularly provides engineers with GIS datasets for use in their own CAD and GIS systems to perform preliminary engineering, stormwater management planning, infrastructure planning & design. Elevation data, air photos, and flood hazard areas, wetlands, soils and other datasets are sold frequently
	<b>Surveyors</b>	The LIO frequently provides Surveyors with data including parcel map datasets, elevation / topography data, floodplain information, ESAs and Transportation.
	<b>Realtors</b>	Realtors regularly use the LIO web site to search property information online, print parcel maps showing lot dimensions and linked to tax assessment, ownership, school district, aerial photos and more.
	<b>Home Builders</b>	The LIO provides online access to property information, which home builders utilize for site design and to market properties
	<b>Architects</b>	The LIO provides data which architects use to plan and model buildings. Aerial photo maps and property information is frequently used for site considerations and design.
	<b>Banks</b>	Banks rely on the County's Land Information for assessment data, tax information, ownership information, lot dimensions and more. Banks frequently access land information online, while many also purchase our land records databases for advanced analysis
	<b>Appraisers</b>	Appraisers use the GIS data produced by the LIO to help with property research. They often cross reference real estate information housed in the Register of Deeds with GIS mapping for their analysis
	<b>GIS providers</b>	Google, Microsoft, TeleAtlas, American Core Logic, WireData and many others link to and/or purchase the County's GIS datasets as a commodity and/or to supplement or verify their own mapping & navigation products.
	<b>Energy Companies</b>	Wind energy and transmission line companies utilize the GIS data, maps and analytical tools for prospecting to find the most suitable sites to locate their infrastructure and transmit power.
	<b>Utilities</b>	In addition to electric and gas utilities, water and sewer utilities utilize the Land Information Office to gather land use and elevation data to help with flow modeling, preliminary engineering, and inventories.
	<b>Municipalities</b>	Cities, Towns and Villages are frequent customers. The LIO shares datasets and in some cases provides live connections into the County's GIS database, which gives municipalities access to our data so they can gain the same efficiencies outlined in earlier pages of this document. Assessors, economic development coordinators, zoning administrators, and others frequently utilize services provided by the LIO.
	<b>State</b>	Wisconsin DOT, DNR, DATCP, and other state agencies are in close contact with the LIO. GIS datasets and land-related services are frequently shared. State universities are also regular customers and collaborators with the LIO.
	<b>Federal</b>	The LIO provides and collaborates with the U.S. Census bureau, EPA, USGS, Homeland Security, FEMA, USDA, Post Office and other federal agencies on a variety of projects including boundaries and districts, addressing, land ownership and more.

How do external customers access and acquire Land Information?

- Over 500 people per day visit the Property Search and Internet Mapping Web Sites to search and view various types of land records and maps
- The LIO also offers an internet download subscription service, where the more technical customers can download GIS datasets for use in their own GIS/CAD systems for advanced design and analysis
- Some external customers such as the larger municipalities directly access the County's GIS database via computer networking facilitated by the Information Services department.
- Visitors to our office can use GIS terminals and many do purchase printed copies or CDs

## Technology Architecture and Database Design

This section refers to the hardware, software, and systems that the county uses to develop and operate Computer systems and communication networks for the transmission of land information data.

### Hardware

- Multiple servers host land information in Brown County including:
  - Servers hosting the Register of Deeds data
  - Servers hosting the Land Records / Tax system
  - Servers hosting GIS include:
    - A GIS File Server
    - A GIS database server
    - Two GIS application servers (load balanced, active-active) that run ArcGIS Server and drive the web applications
    - Two GIS application servers for Public Safety / 911 (load balanced, active-active) that run the ArcGIS Server and support the Public Safety Communications GIS

### Software

- Fidlar software (Register of Deeds)
- GCS Software (Land Information / Tax Assessment)
- Esri ArcGIS Server (ArcSDE SQL database and web REST services)
- Esri ArcGIS Online
- Esri ArcGIS Desktop
- AutoDesk / AutoCAD Map

### Website Development/Hosting

- Brown County hosts and publishes most of our web services, although some of the non-critical GIS layers are hosted by Esri in the cloud (ArcGIS Online hosted services).
- ArcGIS Online and the Web Appbuilder are used for web app publishing
- An older web map called GeoPrime is still functional as of September 2018. This was a 3<sup>rd</sup> party app purchased from GeoDecisions. This site will be retired in 2019 in lieu of new web apps being published with ArcGIS Online.

## Metadata and Data Dictionary Practices

### Metadata Creation

- **Metadata creation and maintenance process:** Brown County uses ArcCatalog to develop and create geospatial metadata. Most of this metadata is available online through web services, and it is "embedded" in the enterprise GeoDatabase so that it is easily available.

### Metadata Software

- **Metadata software:** Esri ArcGIS Desktop / ArcCatalog
  - The software does generate metadata consistent with the FGDC Content Standard for Digital Geospatial Metadata, and ISO geographic metadata standard 19115.
- **Metadata fields manually populated:** ArcCatalog handles most of this, but Brown County will populate metadata fields in the 200 or so GIS layers we maintain as needed.

### Metadata Policy

- **Metadata Policy:** No formal metadata policy, although this should be a goal in the future.



## Municipal Data Integration Process

- Municipal assessors upload and download county data on an annual basis. Brown County Technology Services has programmed tools to import and export assessment data from the County's Land Records / Tax Collection system to the various assessment software packages (MarketDrive, etc).
- Municipalities assign addresses and provide address data to Property Listing staff to ensure that the data is entered in our Land Records / Tax Assessment system and the GIS map.
- The larger municipalities (Green Bay, DePere, Ashwaubenon, and Howard) have direct network access to the County's GIS server and enterprise geodatabase via a fiber connection.
- Other communities including Hobart, Bellevue and Denmark are connecting to the web services published from ArcGIS Server to download or synchronize GIS data. For example, the Village of Hobart has a script that downloads a current copy of Brown County's parcel layer, joins it with Hobart's version of the layer with zoning attributes, then updates the village's ArcGIS Online service using the new data. This keeps the parcel layer on the village's ArcGIS Online map up to date with current county parcels.

# Public Access and Website Information

## Public Access and Website Information (URLs)

### Public Access and Website Information

#### GIS Webmapping Application(s) Link - URL

<https://browncounty.maps.arcgis.com/apps/webappviewer/index.html?id=61fba3fd419045e48aa6ba759838387c>

#### GIS Download Link - URL

[https://www.co.brown.wi.us/departments/page\\_a7c50fe306ac/?department=85713eda4cdc&subdepartment=89ce08984445](https://www.co.brown.wi.us/departments/page_a7c50fe306ac/?department=85713eda4cdc&subdepartment=89ce08984445)

#### Real Property Lister Link - URL

[https://www.co.brown.wi.us/departments/page\\_23605e6ac19b/?department=85713eda4cdc&subdepartment=89ce08984445](https://www.co.brown.wi.us/departments/page_23605e6ac19b/?department=85713eda4cdc&subdepartment=89ce08984445)

#### Register of Deeds Link - URL

[https://www.co.brown.wi.us/departments/page\\_2720f242cca8/?department=e7fb85d94ba9&subdepartment=773844d034b1](https://www.co.brown.wi.us/departments/page_2720f242cca8/?department=e7fb85d94ba9&subdepartment=773844d034b1)

### Single Landing Page/Portal for All Land Records Data

#### URL

[www.gis.co.brown.wi.us](http://www.gis.co.brown.wi.us)

### Municipal Website Information

#### Municipal Website

All Brown County municipal web sites are indexed here

#### Municipal Website URL

[https://www.co.brown.wi.us/departments/page\\_740c829eff2a/?department=85713eda4cdc&subdepartment=89ce08984445](https://www.co.brown.wi.us/departments/page_740c829eff2a/?department=85713eda4cdc&subdepartment=89ce08984445)

The Brown County LIO web page is designed to be a "single landing page" for all Land Information.

More will be done to enhance this portal in the next three years.

## Data Sharing

### Data Availability to Public

#### Data Sharing Policy

- No formal policy exists in document form, although the Land Information Council has provided guidance over the years, particularly with regard to land owner names and privacy. Brown County shares nearly all of its data with the public online or as requested.

#### Open Records Compliance

- Brown County makes every effort to comply with Wisconsin's Open Records Law. Almost all land information is available to the public via the Internet.

### Data Sharing Restrictions and Government-to-Government Data Sharing

#### Data Sharing Restrictions

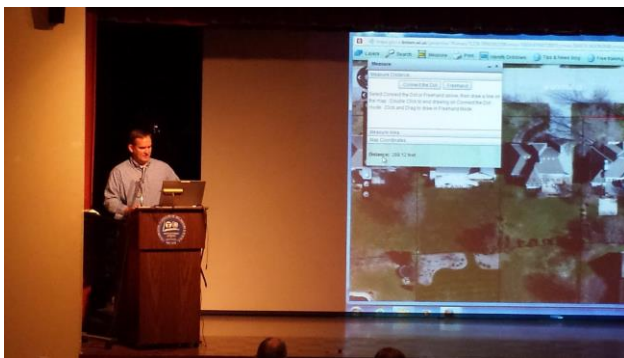
- Brown County's Land Records Search and GIS mapping sites are free and can be used without restriction, except that searches do not include "Search by Owner Name". Owner name searches were restricted on free sites after a discussion by the Land Information Office Committee in response to correctional officers who expressed concern about this when our mapping site first went online in the early 2000s.
- Data Downloads include parcel information (with owner names) inside Microsoft Access and Excel files as well as GIS files. These files can be downloaded free, but as noted above, people must register with a valid email address prior to download.

#### Government-to-Government Data Sharing

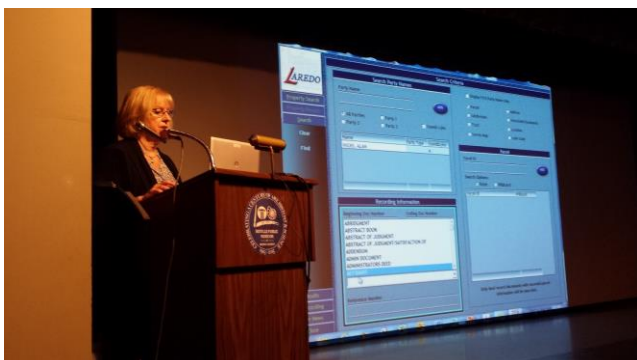
- Brown County routinely shares data with local, state, federal, and tribal governments as well as utilities.

### Training and Education

- Brown County utilizes Land Information Program Training & Education Grants, along with other funds when budgeting allows, to send staff to conferences and other training opportunities. Internal User Group meetings have also been held. Often, 1-on-1 training is most effective when working with software tools for specific tasks.
- We also put on training seminars as time permits (illustrated below).



Photos from the Brown County "Land Information Day" held at the Neville Public Museum auditorium in November 2015. About 60 people attended and received training on the use of the county's online GIS mapping and the software provided by the Register of Deeds office.



# 4 CURRENT & FUTURE PROJECTS

This chapter lists the current and future land information projects the county is currently undertaking or intends to pursue over its planning horizon. A project is defined as a temporary effort that is carefully planned to achieve a particular aim. Projects can be thought of as the *means* to achieving the county's mission for its land information system.

This chapter lists the current and future land information projects Brown County is currently undertaking or intends to pursue over the 3-year planning horizon of this document.

For each project, the following are identified:

- Project Description/Goal
- Business Drivers
- Objectives/Measure of Success
- Project Timeframes
- Responsible Parties
- Estimated Budget Information



The WLIP allows this plan to be amended in the future should other significant projects arise.

## Project #1: PLSS corner remonumentation

### Project Description/Goal

- Brown County will continue to maintain or remonument PLSS corners as needed. Tie sheets will continue to be updated and posted online to the Brown County Survey & Tie Sheet Viewer GIS app. PLSS coordinates will continue to be integrated into the county's parcel mapping. This project fits within the Wisconsin Land Information Program "Benchmark 4" activities.

### Planned Approach

- The County Surveyor and Survey Crew Chief are actively resetting corner monuments.

### Current Status

- **Tally of the total number of corners:** 3036 PLSS corners exist in Brown County.
- **Re monumentation status:** 2355 (78%) have been remonumented.
- **Coordinate status (accuracy class):** All remonumented corners have Survey Grade coordinates

### Goals

- **Number of corners to be remonumented and/or rediscovered:** 681
- **Number to have new coordinates established:**
- **Accuracy class for these new coordinates:** Survey Grade
- **Way in which these points will be integrated into the parcel fabric:** All survey corner coordinates are used for digital parcel mapping control.

### Missing Corner Notes

- **Documentation for any missing corner data:** This information is available upon request to the Brown County Surveyor.

### County Boundary Collaboration

- The Brown County Surveyor communicates with adjacent county surveyors as corner maintenance efforts take place along county boundaries.

### Business Drivers

- This framework data has always been a basic function of local government as it is the basis for property ownership and other boundary determinations.



- All foundational elements will benefit from a more accurate and complete PLSS framework.
- The Project Plan for PLSS is a requirement for those counties who utilize Strategic Initiative funds for work related to PLSS completion and integration.

## Objectives/Measure of Success

- The objectives of this project are as follows:
  - To reach satisfactory completion of the PLSS network.
  - To have Survey Grade (2cm or better) coordinates on all corners
  - To post all corner information (including tie sheets) to Brown County's Survey Index & Tie Sheet Viewer GIS app for use by private surveyors and land owners.
  - To increase the accuracy of boundary surveys done by all surveyors working in Brown County.



## Project Timeframes

- Corner remonumentation is an ongoing project as road construction and other projects necessitate monument maintenance. Between January 2017 and September 2018, over 270 corners were maintained and new tie sheets were produced.

## Responsible Parties

- County Surveyor (Brown County Planning & Land Services Department)
- Survey Crew Chief (Brown County Planning & Land Services Department)

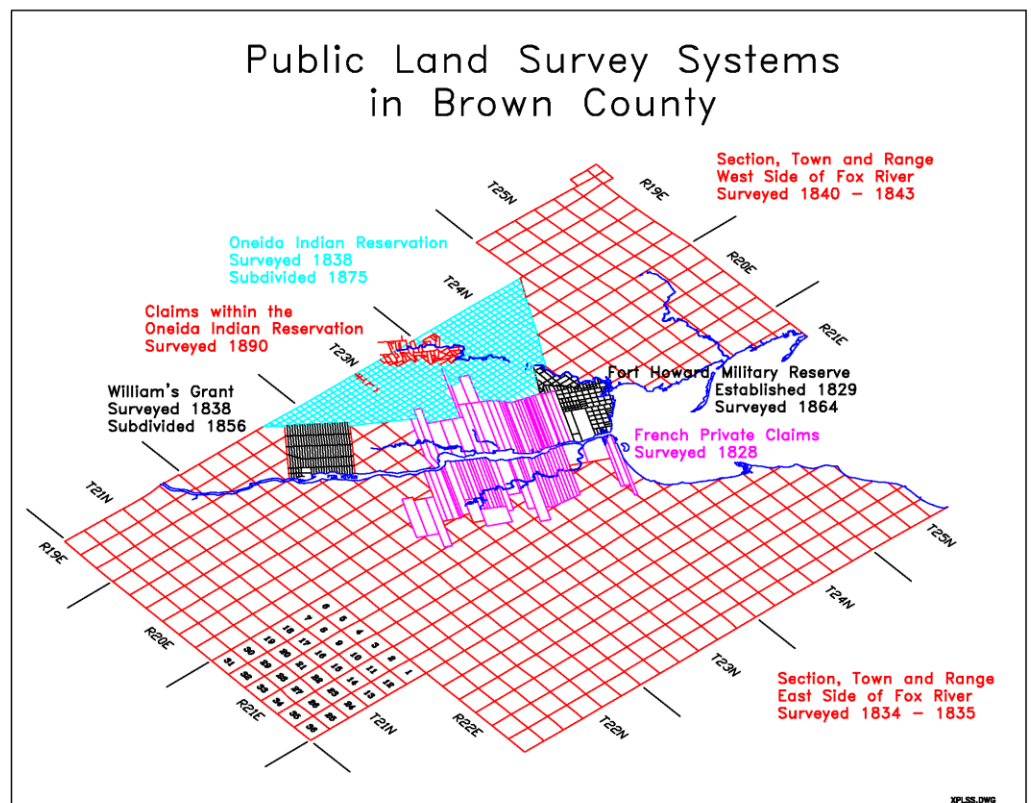
## Estimated Budget Information

- See table at the end of this chapter.

There are six different Public Land Survey Systems in use within Brown County:

- 1) French Private Claims
- 2) Fort Howard Military Reserve
- 3) Williams Grant
- 4) Claims within the Oneida Reservation
- 5) Oneida Reservation
- 6) Section, Town and Range rectangular system.

These systems stem from the area's long and unique history as one of the oldest settlements in Wisconsin.



## Project #2: Scan documents and index them using GIS

### Project Description/Goal

- Brown County will expand the use of document imaging and GIS to “geocode” documents to geography and make them available to the public via the Internet. Currently Brown County geocodes surveys, POWTS permits, and Shoreland permits. These activities will continue in the next three years. We also plan to expand this project to include additional document types including soils tests and ESA (Environmentally Sensitive Area) amendments.
- **Land Info Spending Category:** PLSS (also affects Parcel Mapping, and other Foundational Elements)

### Business Drivers

- Citizens can search and help themselves to land information online
- Land owners and service providers can access permit information online or while on site
- Surveyors and others can access surveys and tie sheets in the field

### Objectives/Measure of Success

- All soil test documents are scanned and geocoded to the GIS map
- All ESA (Environmentally Sensitive Area) Amendments are indexed geographically to the GIS map and published online
- All surveys and PLSS corner tie sheets continue to be indexed to the GIS map and published online.
- All POWTS (Private Onsite Waste Treatment System) documents are scanned, georeferenced to the GIS map, and published to the GIS map online

### Project Timeframes

- Indexing surveys, POWTS and Shoreland Permits is an ongoing activity, but there are still many thousands of records that need to be scanned and indexed. This could take years unless additional resources (such as contracted services) are employed.
- Beginning in 2019, ESA Amendments and soils surveys will be added to the document types that will be scanned and indexed using GIS.

### Responsible Parties

- Planning staff (Brown County Planning & Land Services Department)
- Zoning staff (Brown County Planning & Land Services Department)

### Estimated Budget Information

- See table at the end of this chapter.

## Project #3: Produce Aerial Orthophotography in 2020

### Project Description/Goal

- It is a goal to fly Brown County every 3 years to update aerial orthophotography for use as a current base map and to help track land use changes across the county. The last flight took place in 2017 and, pending sufficient funding, our next flight will be in 2020. Brown County teams up with other organizations whenever possible (local municipalities, adjacent counties, utilities, and state and federal agencies) to lower or share costs for aerial photography.
- The aerial orthophoto will have a 6-inch ground resolution countywide, will capture data in 4 bands (3 natural color + near infrared), and will meet or exceed ASPRS Class 1 standards for 1" = 100' scale mapping.
- **Land Info Spending Category:** Orthoimagery.

### Business Drivers

- Aerial orthophotography is one of the most frequently used GIS map layers and it is important to keep them as current as possible. Aerial photos are a frequent base map for many projects in agriculture, transportation, construction, real estate, engineering and planning. Older photos continue to be frequently used as overlays to track land use changes through time.

## Objectives/Measure of Success

- The objective is to contract for new color, 6-inch resolution aerial photos to be flown in Spring 2020 and available for use in GIS by Fall 2020.

## Project Timeframes

- By spring and summer 2019, secure project funds from municipal and utility partnerships
- By July 2019, include this project in the 2020 budget plan
- By fall 2019, have an RFB or RFP prepared with project specifications
- By early 2020, use the bid or RFP process to select a vendor
- By April 2020 flights will be conducted by the vendor
- By fall 2020, the digital orthophotography will be received by Brown County and evaluated for quality and spatial accuracy
- By December 2020 the project will be completed and imagery will be made available to all users

## Responsible Parties

- GIS/LIO Coordinator (Brown County Planning & Land Services Department)
- County Surveyor (Brown County Planning & Land Services Department)
- Survey Crew Chief (Brown County Planning & Land Services Department)
- Other partnering departments and organizations such as other county departments, municipalities, and utilities.

## Estimated Budget Information

- See table at the end of this chapter.

## Project #4: Produce LiDAR in 2020 and derivatives including 1-foot contours

### Project Title: Contract for LiDAR topographic mapping

#### Project Description/Goal

- The goal of this project is to produce a current and more accurate topographic / digital elevation model which will support projects such as the "Nine Key Elements" watershed plans, storm water management, construction planning (cut/fill estimation), and other projects involving elevation data.
  - The project will include the production of a new Digital Elevation Model and 1-foot contours
- **Land Info Spending Category:** LiDAR and Elevation Data. Note: The WLIP Strategic Initiative Grant may be utilized for this in addition to any other available grants such as the USGS 3DEP, Water Management Grant programs, Coastal Management programs, Great Lakes Restoration Initiative, or EPA nonpoint source funding.

#### Business Drivers

- Regional storm water analysis and design
- Watershed management support including non-point source pollution control
- Construction planning: Preliminary design and earthwork estimates for road/transportation planning

## Objectives/Measure of Success

- The objective is to obtain grants or other funds necessary to contract for LiDAR topographic mapping in 2020 or 2021 and to hire a contractor to perform the aerial survey.

## Project Timeframes

- Project planning and grant application(s) will have to begin by early 2019 if we hope to secure funds by spring 2020. If funding is available, the LiDAR data collection would ideally take place around the same time frame as the planned aerial photography (around April 2020), although if more time is needed

## Responsible Parties

- GIS/LIO Coordinator (Brown County Planning & Land Services Department)
- County Surveyor (Brown County Planning & Land Services Department)
- Partnering agencies such as funding partners from other levels of government.



## Estimated Budget Information

- See table at the end of this chapter.

## Project #5: Refill the GIS Specialist position

### Project Description/Goal

- The GIS Specialist (formerly titled GIS Technician) position has been vacant since 2014. The goal is to refill this position in 2019. This position is needed because Brown County currently has only one person (the GIS/LIO Coordinator) in the Land Information Office division.
- **Land Info Spending Category:** Administration.

### Business Drivers

- Many critical county operations rely on GIS, and the use of the system continues to grow. Brown County currently employs only one full-time GIS professional (the GIS/LIO Coordinator). Other staff assist with GIS editing and mapping, but GIS is not their primary profession or responsibility.

### Objectives/Measure of Success

- The GIS Specialist position will be refilled and will assist the GIS/LIO Coordinator with implementing this plan. The GIS Specialist position will serve as backup support for the GIS/LIO Coordinator on high-level GIS issues.

### Project Timeframes

- The position should be refilled in 2019 and funded every year beyond.

### Responsible Parties

- The Planning & Land Services Director and LIO/GIS Coordinator with support from the County Executive, County Administration, and County Board.

## Estimated Budget Information

- See table at the end of this chapter.

## Project #6: Maintain and Enhance all Foundational Element GIS layers

### Project Description/Goal

- The datasets listed in Section 2 of this plan (the "Foundational Elements") require constant attention and maintenance. In Brown County, this amounts to millions of land records that change through time and need regular upkeep. Maintenance of our existing system is a very important, time-consuming project.
- Brown County will enhance the existing system whenever possible. We are constantly checking data, making it more accurate, or otherwise improving it. As new aerial photos or LiDAR come available (as we anticipate will be the case in 2020), this also affords new opportunities to check over our existing datasets to make updates or improve accuracy.
- New systems coming online also push enhancements. For example, in 2018 the county's new NG911 Computer Aided Dispatch system was much more reliant on GIS than the previous one, and this required a major overhaul of the GIS system.
- **Land Info Spending Category:** Addressing, Street Centerlines, and all other Foundational Elements.

### Business Drivers

- All users of our system benefit from better data, but some of the more notable business drivers for this project include our 911 Computer Aided Dispatch system which is reliant on accurate, up-to-date GIS data.

### Objectives/Measure of Success

- An objective is to ensure that all addresses, parcels, streets, and other 'foundational element' records are kept current, accurate, and accessible to the systems or people who need them. The measure of success would be whether or not critical functions of the county such as planning or 911

### Project Timeframes

- This has been an ongoing project for many years, and we must continue to emphasize this project's importance so that records don't fall too far out of date.

## Responsible Parties

- GIS/LIO Coordinator (Planning & Land Services Department)
- Property Listing Staff (Planning and Land Services Department)
- Planning staff (Planning & Land Services Department)
- Public Safety Communications Department staff
- Land & Water Conservation Department staff
- Municipal staff (for example, address numbers are assigned by municipalities in many areas of the county)

## Estimated Budget Information

- See table at the end of this chapter.

## Project #7: Evaluate software tools like Pintegrity and the Parcel Fabric

### Project Description/Goal

- This project will involve Brown County staff evaluating new land records tools such as Laredo's "Pintegrity" and Esri's "Parcel Fabric" for their potential in streamlining work flows and making accurate, up-to-date information more easily available to all users of the data including the public. If we determine these tools to be useful, they would be purchased pending sufficient funding.
- Brown County will also start transitioning from the older GIS Desktop software (ArcMap) to Esri's newer Desktop software product called ArcGIS Pro. ArcMap and ArcGIS Pro are the software products that internal staff use to edit and analyze map data, as well as to publish maps.
- **Land Info Spending Category:** Software.

### Business Drivers

- Maintaining and improving efficiency in our day-to-day work flows.

### Objectives/Measure of Success

- If these tools increase the efficiency of our operations in a cost-effective manner, we will consider this project successful.

### Project Timeframes

- The evaluation of the Pintegrity software will begin in late 2018 or early 2019.
- We will look into the Parcel Fabric when time permits, probably 2019 or 2020.

### Responsible Parties

- Brown County Register of Deeds
- Brown County Land Information Office
- Brown County Property Listing

### Estimated Budget Information

- See table at the end of this chapter.

## Project #8: Rebuild and reorganize the Land Information Office Web Site

### Project Description/Goal

- Update the Land Information Web site using the new county template that will be available starting in 2019.
- **Land Info Spending Category:** Public Access.

### Business Drivers

- The public expects a more modern, easy-to-use look and feel for these web sites. The new template allows us to create a site with a "cleaner" look, and it scales to various screen sizes automatically.

### Objectives/Measure of Success

- The new web site should be in place by 2019.

### Project Timeframes

- Early 2019: County Technical Services will provide us with the new template and tools to edit it

- Mid 2019: The LIO will rebuild the Land Information web page, embed any necessary Esri GIS portal tools.
- Late 2019: The new LIO web site will be published to the web.

### Responsible Parties

- GIS/LIO Coordinator (Planning & Land Services Department)

### Estimated Budget Information

- See table at the end of this chapter.

## Project #9: Maintain and improve GIS applications such as the BrownDog

### Project Description/Goal

- Update web applications such as the BrownDog online GIS map, and further implement web data access tools such as the Portal.
- **Land Info Spending Category:** Public Access.

### Business Drivers

- The expectation of public and other users is to continue growing the GIS system on the World Wide Web. As the Internet continues to rapidly evolve, the LIO plans to keep pace by updating the online "BrownDog" online GIS map, the Portal, and other web mapping applications. By far the most usage our GIS system gets comes from the web interfaces, which are used by external customers as well as internal staff.

### Objectives/Measure of Success

- The measure of success is whether the internet sites can be maintained with current technology and data, and whether these help all customers find and use the land information they are seeking.

### Project Timeframes

- This is an ongoing project.

### Responsible Parties

- GIS/LIO Coordinator (Planning & Land Services Department)
- Brown County Technology Services (TS) Department
- Other departments who publish land information / GIS on the web (Planning, Parks, Land & Water Conservation, and others).

### Estimated Budget Information

- See table at the end of this chapter.

## Project #10: Educate and train staff

### Project Description/Goal

- Brown County will emphasize staff training & education over the next three years. Most of this will come through one-on-one, informal training sessions although we will look for opportunities for more formal training classes as well. We will also meet as user groups and attend conferences. Also, users of the online system will be kept informed through the Brown County GIS/LIO blog
- **Land Info Spending Category:** Training & Education

### Business Drivers

- Staff needs to stay informed and skilled with the ever-changing technology we utilize.

### Objectives/Measure of Success

- New and existing staff members will be trained with tax roll preparation and have the AutoCAD and ArcGIS skills to maintain parcels and other map layers.
- All users will be provided training and sent to conferences as budgets allow.
- The Brown County GIS/LIO blog will be maintained with new posts.

## Project Timeframes

- Training & education is an ongoing effort.

## Responsible Parties

- All Brown County staff.

# Project #11: Enhance GIS data to support surface water drainage & hydrologic modeling

## Project Description/Goal

- The goal is to create or enhance GIS data layers that are used to support hydrologic modeling and storm water management. This includes the LiDAR Digital Elevation Model along with other GIS data layers such as streams and culverts. Along with the ArcHydro tools, these inputs can be used to create detailed drainage models which include flow direction, flow accumulation, catchment, watershed, and other hydrologic features.
- **Land Info Spending Category:** Hydrography.

## Business Drivers

- "9-Key Element Watershed Planning" Efforts
- Regional storm water analysis and design
- Other ongoing efforts involving stormwater management, nutrient management, pollution abatement, and erosion control.

## Objectives/Measure of Success

- The county will build better hydrologic modeling capabilities using GIS data.
- The county's hydrology layers will include stream flow (vector) information..
- Culvert inventories produced by municipalities and other organizations will be compiled into a countywide dataset to support hydro modeling across all watersheds in Brown County.
- The LiDAR-based Digital Elevation Model (DEM) will be "hydrologically-conditioned" using the hydrology and culvert layers to support more accurate water flow modeling.
- Accurate, detailed "flow direction" and "flow accumulation" GIS layers will be produced using the ArcHydro tools and the datasets listed above.
- Catchment, basin, and watershed boundaries will be more accurately delineated.
- New surface water GIS data and layers will be made available to resource managers via the Land Information Office web site.

## Project Timeframes

- Hydrography and culvert information will be compiled in 2019-2020. It is possible that road culverts within the Lower Fox River Watershed will be mapped in support of the "9-Key Element Watershed Planning Efforts" during this time frame.
- Much of the work will occur after the LiDAR flight (Project #4) planned in 2020.

## Responsible Parties

- GIS/LIO Coordinator (Planning & Land Services)
- Staff from the Brown County Land & Water Conservation Department

## Estimated Budget Information

- See table at the end of this chapter.

## Estimated Budget Information (All Projects)

Estimated Budget Information				
Project Title	Item	Unit Cost/Cost	Land Info Plan Citations Page # or section ref.	Project Total
<b>1) PLSS corner remonumentation</b>	Brown County Surveyor and Survey Crew Chief	To Be Determined	Page 33-34	To Be Determined
				<b>To Be Determined</b>
<b>2) Scan documents and index them using GIS</b>	Planning & Land Services staff	To Be Determined		To Be Determined
<b>3) Aerial orthophotography</b>	GIS/LIO Coordinator	5% of \$80,000 =	Page 35-36	4000
	Contracted service	48,000		
				<b>52,000</b>
<b>4) LiDAR</b>	GIS/LIO Coordinator		Page 36	
	Contracted service			
<b>5) Hire GIS Specialist</b>	GIS/LIO Coordinator		Page 37	To Be Determined
	GIS Specialist			
	Student Intern			
	Land & Water Cons.			
<b>6) Maintain Foundational Elements</b>	GIS/LIO Coordinator		Page 37-38	To Be Determined
	GIS Specialist			
	Planning Staff			
	Others			
<b>7) Implement new software</b>	Pintegrity		Page 38	To Be Determined
	Parcel Fabric			
	Portal			
<b>8) Rebuild LIO web site</b>	GIS/LIO Coordinator		Page 38-39	To Be Determined
<b>9) Enhance GIS apps</b>	GIS/LIO Coordinator			
	GIS Specialist			
<b>10) Training &amp; Education</b>	All staff			\$2000 annually
<b>11) Hydrologic Modeling</b>	GIS staff			To Be Determined
	Student intern(s)			
<b>GRAND TOTAL</b>				<b>To Be Determined</b>

Note. These estimates are provided for planning purposes only. Budget is subject to change.

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