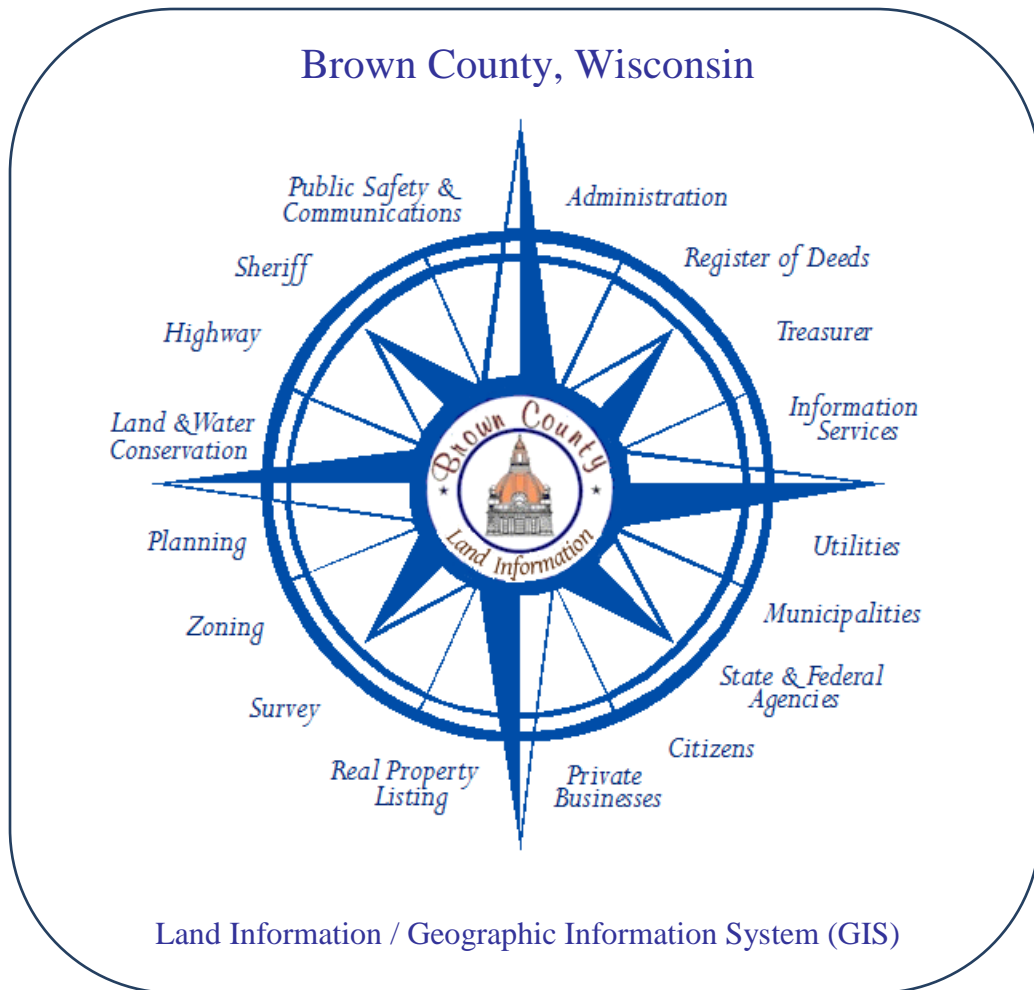


Land Records Modernization / Land Information 5-Year Strategic Plan

2010 – 2015



Brown County Land Information Office

Plan Approval Checklist:

- | | |
|--|--------------------|
| ✓ Land Information Office (LIO) Committee* | September 15, 2010 |
| ✓ Planning, Development & Transportation Committee | September 27, 2010 |
| ✓ Brown County Board | October 20, 2010 |
| LIO Peer Review | |
| Wisconsin Department of Administration | |

- Note: The Land Information Office (LIO) Committee was renamed the “Land Information Council” by County Board ordinance on October 20, 2010

Brown County Wisconsin
Land Information Plan 2005 - 2010

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Acknowledgements

The Land Information Office thanks the many individuals and organizations who have contributed to the success of land records modernization and GIS within Brown County. Without a cooperative effort from many people, the numerous users of the Brown County land information system could not have realized the benefits we enjoy today.

We acknowledge the many individuals representing various groups from around the state who created the Wisconsin Land Information Program over two decades ago. Thanks to their forward thinking, the collection of 150-year-old land records has been transformed from an inefficient, unwieldy paper-based assortment into a modern system of integrated and readily-accessible information. The citizens of Wisconsin and Brown County are realizing cost-savings and other benefits in many ways, both directly and indirectly, due to the foresight of this group.

We are also grateful to the individuals and organizations who helped support the legislation that recently became 2009 Wisconsin Act 314, which will help ensure continued success of the Wisconsin Land Information Program over the next five years and beyond. We are indebted to the individuals on the Brown County Land Information Office Committee and County Board for helping to set this legislation in motion, and the many County Boards across the state who passed supporting resolutions, as well as the Counties Association for their support. We thank Sen. Erpenbach and Rep. Soletski for authoring and sponsoring the legislation, and the Wisconsin State Legislature for voting nearly unanimously to make Act 314 a law. We also thank members of the Register of Deeds Association, Realtors Association, Wisconsin Society of Land Surveyors, and Land Information Officer Network, Wisconsin Land Information Association, and others for their efforts in helping this legislation through the adoption process.

Last but certainly not least, a big thanks goes to the individuals shown as “Participants who helped prepare this plan” (listed below). Brown County’s thriving Land Information Program is due to their sustained hard work and diligence.

I. Introduction

A. Identification and contact information

Jeffrey D. DuMez
 GIS/LIO Coordinator, Land Information Officer
 305 East Walnut Street
 Green Bay WI 54301
 Phone: 920 448-6295
 Fax: 920-448-4487
 Email: dumez_jd@co.brown.wi.us
 Web site: <http://www.gis.co.brown.wi.us/>

B. Participants who helped prepare this plan

* indicates Land Information Office Committee member as of 2010

| Name & Affiliation | Contact Information |
|---|--|
| Jeff DuMez See above | See above |
| Bernie Erickson* Brown County Board of Supervisors - Planning, Development & Transp. Committee | 868 Dousman St Green Bay WI 54303 P: 920.497-9006 / E: BErickson6@new.rr.com |
| Kerry Blaney* County Treasurer | 305 E. Walnut St. 1 st Floor Green Bay, WI 54301 P: 920.448.6321 / F: 920.448.6341 E: blaney_km@co.brown.wi.us |
| William Bosiacki* Zoning Administrator | 305 E. Walnut St. 3 rd floor Green Bay, WI 54301 P: 920.448.4488 / F: 920.448.4487 / E: bosiacki_bs@co.brown.wi.us |
| Bill Hafs* County Conservationist Land Conservation Department | 1150 Bellevue St. Rm. 140 Green Bay, WI 54302 P: 920.391.4633 / F: 920.391.4617 / E: hafs_bc@co.brown.wi.us |
| Keith Deneys* Captain (Support) Brown County Sheriffs Department | 300 E. Walnut St. Green Bay, WI 54301 P: 920.448.4217 / F: 920.448.4206 / E: Deneys_kd@co.brown.wi.us |
| Bill Boyle* GIS Coordinator City of DePere | 335 S. Broadway St DePere, WI 54115 P: 920.339-4072 / F: 920.330-9491 / E: bboyle@mail.de-pere.org |
| Chuck Lamine* Director Brown County Planning Commission | 305 E. Walnut St 3 rd floor Green Bay, WI 54301 P: 920.448.6480 / F: 920.448.4487 / E: lamine_cf@co.brown.wi.us |
| Ellen Sorenson* Director Brown County Administration | 305 E. Walnut St. 5 th floor Green Bay, WI 54301 P: 920.448.4035 / F: 920.448.6249 / E: Sorensen_EC@co.brown.wi.us |
| Dorothy Erickson* Realtor Mark D. Olejniczak Realty Inc. | 375 W. St. Joseph St. Green Bay, WI 54301 F: 920.321-9138 / F: 920.436-7771 / E: Dorothy.erickson@olej.com |
| Ray Smith* Engineer Highway Department | 2198 Glendale Ave. Green Bay, WI 54303 P: 920.492.4925 / F: 920.434.4576 / E: smith_wr@co.brown.wi.us |

| | |
|--|---|
| Shelly Nackers* Interim Director / Communications Supervisor Public Safety Communications | 307 S. Adams St. Rm. 225 Green Bay, WI 54301 P: 920.448.7610 / F: 920.448.4487 / E: Nackers_SM@co.brown.wi.us |
| Bob Heimann* Director Information Services | 305 E. Walnut St, 5 th floor Green Bay, WI 54301 P: 920.448.4032 / F: 920.448.6266 / E: Heimann_RJ@co.brown.wi.us |
| Pat Ford* Survey Coordinator | 305 E. Walnut St. 3 rd floor Green Bay, WI 54301 P: 920.448.4493 / F: 920.448.4487 / E: Ford_PJ@co.brown.wi.us |
| Jim Wallen* Real Property Lister | 305 E. Walnut St. 3 rd floor Green Bay, WI 54301 P: 920.448.6224 / F: 920.448.4487 / E: wallen_je@co.brown.wi.us |
| Cathy Williquette* Register of Deeds | 305 E. Walnut St. 2 nd floor Green Bay, WI 54301 P: 920.448.4469 / F: 920.448.4449 / E: williquette_ca@co.brown.wi.us |
| Debbie Gore Deputy Register of Deeds | 305 E. Walnut St. 2 nd floor Green Bay, WI 54301 P: 920.448.4149 / F: 920.448.4449 / E: Gore_DA@co.brown.wi.us |
| Cullen Peltier Director Brown County Emergency Management | 3028 Curry Ln. Green Bay, WI 54311 P: 920-448-4270 / F: 920-448-4206 E: Peltier_CS@co.brown.wi.us |
| Paul Gazdik Emergency Management Coord. Brown County Emergency Mgmt. | 3028 Curry Ln Green Bay, WI 54311 P 920-391-7431 E: Gazdik_PR@co.brown.wi.us |
| Joan Radue Property Analyst Brown County Property Listing | 305 E. Walnut St Green Bay, WI 54311 |
| Dan Drewery Traffic Foreman (signs) Brown County Highway | 2198 Glendale Ave Green Bay, WI 54305 P: 920-662-2174 E: Drewery_DS@co.brown.wi.us |
| Cleo Klubertanz Permits Brown County Highway | 2198 Glendale Ave Green Bay, WI 54305 P: 920-662-2171 E: Klubertanz_CJ@co.brown.wi.us |
| Ryan Finstad MIS Specialist Brown County Public Safety | 3028 Curry Ln. Green Bay, WI 54311 (920) 391-7403 E: Finstad_RR@co.brown.wi.us . |
| Aaron Schuette Senior Planner Brown County Planning | |
| Peter Schleinz Senior Planner Brown County Planning | |
| Dan Teaters Planner 1/GIS Brown County Planning | |
| Lori Williams Office Manager Brown County Planning & Land Services | |
| Lisa Luedke Sanitary Inspector Brown County Zoning | |
| Matt Heyroth Assistant Zoning Administrator Brown County Zoning | |

| | |
|--|--|
| Francine Roberg GIS Coordinator Village of Ashwaubenon Engineering Department | 2155 Holmgren Way Ashwaubenon, WI 54304 P: 920.492.2308 / F: 920.492.2328 / E: froberg@ashwaubenon.com |
| Mike Hronek I.T. Director / GIS Coordinator City of Green Bay | 100 N. Jefferson St. Green Bay, WI 54301 P: 920.448.3427 / F: 920.448.3426 / E: mikehr@ci.green-bay.wi.us |
| Tim Niemi GIS Coordinator Village of Howard Engineering Department | 1336 Cornell Rd Green Bay, WI 54313 P:920.434.4060 / F: 920.434.4072 / E: tniemi@village.howard.wi.us |
| Tim Hennig GIS Coordinator Village of Bellevue | 2828 Allouez Ave Bellevue, WI 54311 P: 920.468-5225 / F: 920.468.4039 / E: timh@villageofbellevue.org |
| Graham Callis | |
| Josh Schedler GIS Specialist Bay-Lake Regional Planning | 211 N Broadway Ste 211 Green Bay, WI 54303 P: 920.448.2820 / F: 920.448.2823 / E: jschedler@baylakerpc.org |
| Other comments & input were received through other communications | |

C. Executive Summary

Many of the County's essential services rely on accurate and up-to-date land information. Emergency response, resource conservation, infrastructure planning, facility maintenance, economic development, 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, roads, building, utilities, floodplains, response districts, voting wards, zoning, land use, tax parcels and other combinations of land information is critical for various functions of government and very beneficial to the public as well.

Geographic Information System (GIS) has the unique ability to combine land information into a comprehensive system that can be shared throughout each County department and also easily distributed to businesses and citizens who use land records and maps. GIS has emerged as a best framework for storing, identifying, searching, and analyzing massive volume of data, maps, documents, and other data information. GIS has proven to be a very powerful way to combining text search and geographic search to allow analysts and decision makers to see relevant information faster.

The Wisconsin Land Information Program (WLIP) provides the resources and support to keep each county's land records system and GIS in operation. Brown County has benefited greatly from the WLIP since its inception nearly 20 years ago, and we plan for continued success over the next 5 years.

The purpose of this document is to update Brown County's Plan for Land Records Modernization and GIS. The overall goal of this plan is to ensure key program functions of the County are supported. Additionally, Wisconsin State Statute 59.72 requires that Counties update their Land Information Plans every 5 years in order to retain the real estate document recording fees which fund the program. Finally, this document provides county and municipal officials, private businesses, and other interested parties with basic knowledge of the County's efforts in land information and GIS.

The format and content of this Plan is based upon the Wisconsin Department of Administration's *Uniform Instructions for Preparing County Land information Plans* dated December 2009.

Over the next five years, the emphasis for the Brown County Land Information Program will be on continuing to add value and create efficiencies by enhancing our "Enterprise GIS" and in particular expanding the use of Mobile GPS/GIS technology, developing more document imaging implementations, creating a better address management system, and employing "LEAN Management" work flow analysis to improve efficiency and accuracy while maintaining the many other datasets within our existing GIS system.

Once approved, this Plan supersedes all previous Brown County Land Information Plans and in itself, sets forth Brown County's Land Records Modernization Plan for a time frame of 2010 – 2015.

D. County Web Sites serving Land Information

Brown County has several Internet applications that vary in audience and purpose but in general serve to expand the use of digital land records outside of the County network.

All land records and maps available on the County web site are indexed at: <http://www.gis.co.brown.wi.us/>.

Below is a description of some of the most popular online services:

1. Property Search

This is the most heavily used County web site, with over 500 visitors per day. This is a free web site that allows people to search properties by address or parcel number. The results of the search will include property owner name, district information, assessor land class, assessed values, acreage, mailing address, reference document number, tax records, legal description, comments/history and a link to the GIS map of the parcel.

2. Internet GIS map viewer

This site receives about 400 visitors per day and links to the Property Search and other sites. The GIS map viewer displays a wide range of data in both map and data form, and also includes hyperlinks to other documents such as PDFs. Detailed, up-to-date parcel mapping for the entire county can be viewed and each parcel can be identified to display owner names and all of the other information available within Property Search. The GIS map viewer also displays aerial photography from various years dating back to 1938. Many other “map layers” are also available, including streets, addresses, district boundaries, polling places, land use, transit service features, and environmental layers such as topography, wetlands, floodplains, soils and more. Many map features “hyperlink” to other documents. For example, the survey corners on the map hyperlink to the section corner tie sheets, and floodplain map features link to source documents (Official FEMA panels, letters of map amendments, etc). This site was developed in partnership with the Cities of Green Bay and DePere to help share resources in terms of costs as well as the base mapping.

3. Real Estate Records

The Register of Deeds office offers popular services called “Tapestry” and “Laredo” which serve up the tract index for real estate documents and real estate document images such as Deeds, CSMs, and Subdivision Plats. “Tapestry” is designed for the occasional user, while “Laredo” is designed for daily professional users (title company employees, abstractors, etc). The fees for the searches on these systems are scalable depending on need and usage.

E. Municipal Web Sites serving Land Information

Several municipalities within Brown County have land information online, including:

- 1. The City of Green Bay** offers assessment records tied to an interactive online map. The city also displays E911 police calls in both map and text form, as well as all sorts of maps including census, business parks, historic districts, fire & police districts, development districts, and more. Additionally, public works routes such as garbage pickup are displayed. <http://www.ci.green-bay.wi.us/gis/index.html>
- 2. The City of DePere** offers several maps and land related documents and is soon to launch a GIS map viewer as well. <http://www.de-pere.org/egov/apps/services/index.egov>
- 3. The Village of Ashwaubenon** offers “Access Ashwaubenon”, a GIS web site that displays street department routes, pedestrian facilities, village parks & trees, political boundaries, zoning, TIF boundaries, ward maps, and other Village-maintained map layers. <http://www.ashwaubenon.com/Departments/EngineeringGIS/tabid/61/Default.aspx>
- 4. A number of communities** have assessment data searchable online through <http://assessordata.net/>. These include Ashwaubenon, Village of Bellevue, Village of Hobart, Village of Howard, Village of Pulaski, Village of Wrihstowntown of , Ledgerview, and Town of Morrison.

Others plan to be online soon, with web sites hosted internally or by the County.

Brown County will continue to keep a current index to these web sites at <http://www.gis.co.brown.wi.us/>

II. LAND INFORMATION PLAN

A. Goals and Objectives

1. Goals, Objectives, User Needs, Priorities, and Timeline

The goals and objectives outlined below are based on a Needs Assessment conducted by the GIS/LIO Coordinator in the spring and summer of 2010. This Needs Assessment involved input and participation from departments and organizations represented on the Land Information Office Committee, as well as staff from related outside organizations (such as municipalities and real estate professionals) as well as the general public. The detailed notes from the interviews are available upon request. The goals and objectives were also set using previous strategic plans, annual work program and budget reviews, policies set forth by the County, and the ongoing oversight of the Land Information Office Committee (soon to be reconstituted as the Land Information Council).

The results of this Needs Assessment, when analyzed, revealed many issues and needs that had commonality across business areas. These common needs allowed for the development of a set of 6 general Goals as outlined below:

Goal: To further enhance our “Enterprise GIS” capabilities by upgrading technology related to GIS to allow for a more fail-safe, secure, better performing GIS editing and viewing environment.

Objectives

- Upgrade the GIS “Production” GeoDatabase Server with more disk space capacity, faster processing power, and the latest version of Microsoft SQL Server and ArcGIS Server “Basic”. (2010-2011)
- Purchase and implement ArcGIS “Image Server” software with extensions to allow for less redundant storage of aerial photos and other images and to enable the digitization and ortho-rectification of historic photos. (2010-2011)
- Upgrade the “Publication” GIS server to ArcGIS Enterprise Server Advanced to enable the development of Mobile GIS applications and more web-based GIS functionality and spatial analysis. (2011)
- Set GIS Editing to occur on the “Production” GeoDatabase create a Replication process to synchronize those edits onto the “Publication” database accessible to GIS “Viewers” on a daily basis. (2010-2011)
- Purchase “Workflow Manager for ArcGIS” software to standardize and streamline GIS data management work flows, to upgrade the “EditorLog”

scripting currently used by Property Listing staff for parcel mapping, and enable historical tracking of edits. (2011)

- Upgrade the well-used “BrownDog” ArcMap application to run on the latest versions of ArcGIS Desktop and Windows. (2010-2011)
- Evaluate each GIS user’s needs and match them to the appropriate GIS software. Wherever possible, use the GIS web site rather than Desktop software to reduce overhead and software licensing costs. (2010-2011)
- Evaluate and if needed, purchase the “GIS Data ReViewer” software to help with quality control management. (2011)
- Continue to enhance public access to data via Internet Map Services and the FTP (File Transfer Protocol) services. (ongoing)
- Evaluate the AS/400 platform and if needed, replace with a Windows-based server and database; convert all land records still housed on the AS/400 to SQL Server, further integrating into GIS. This is a big project and will require coordination with Information Services and other groups. A detailed project work plan will be required. (2014-2016).
- Establish partnerships with the Brown County Municipalities to share data and map server resources for Internet Mapping technology to produce ‘seamless’ mapping applications for public users across the county. (2011-2012)
- Continue to provide direct access to the Land Records and GIS to municipalities having a dedicated T1 or other secure network connection. Expand this service to the municipal assessors to facilitate greater data sharing. (ongoing)
- Purchase a new large format printer for the Planning & Land Services Department to replace the old one. (2015)
- Maintain a computer replacement schedule and budget to ensure the GIS “power users” have up-to-date computer hardware. (ongoing)
- Purchase Adobe Acrobat Professional software for the Planning and Land Services Department staff to enable staff to create and edit land records maps and reports in the industry standard PDF format. (2010)
- Create an online mapping application to enable municipalities and the public to note road construction and other projects that will affect travel, affect 911 service, disturb PLSS corner monuments, or any other sort of change. (2014)
- Assist the Emergency Management staff in creating a web-based GIS application to allow the public to look up properties and determine if any hazardous chemicals stored nearby might affect them in case of an accident under the Emergency Planning and Community Right-to-Know Act (EPCRA). (2011)

Goal: To take advantage of efficiencies and data quality improvements offered by mobile GIS and integrated Global Positioning Systems (GPS) technology; to implement GPS into work flows to save fuel when driving to locations, locating existing assets on location, and more accurately collecting data in the field for update to the GIS database.

Objectives

- Pending a cost-benefit analysis, purchase GPS in the Zoning division of the Planning & Land Services Department for activities relating to the location and collection of wells, sanitary systems, and Shoreland permits. Elevation accuracy needs to be within inches. *(2012-2013)*
- Assist the Highway Department in the use of GPS for the purpose of accurately locating and maintaining an inventory of street signs, culverts, passing zones, and permits. *(2011)*
- Assist the Emergency Management staff in the purchase of GPS for the use of field data collection including GIS layer updates and photos. *(2011-2012)*
- Evaluate and document the cost-benefits of using GPS in the Land Conservation Department. *(2011-2012)*
- Create a streamlined GIS / mapping tool to enable Sheriff Deputies to quickly obtain accurate in-car directions from current locations to incidents and to provide GIS data that can be used for tactical mapping. *(2012)*
- Purchase a laptop (“Tuffbook” or other suitable field computer) and associated GIS/GPS software for use by the Survey staff. *(2011 or 2012)*

Goal: To expand the use of Document Imaging and GIS to “geocode” documents to geography (such as permits) and make them available to the public via the Internet.

Objectives

- Complete back-scanning of Survey Corner Tie Sheets, implement a procedure to maintain the tie sheet images in electronic format and make them accessible on the Internet via the GIS web site. *(2010)*
- Obtain electronic images and files of floodplain-related documents such as Letters of Map Amendment/Revision (LOMA/LOMR) and make them accessible on the Internet via the GIS web site. *(2010 - ongoing)*
- Scan the Sanitary Permits held in the Zoning office; use GIS to geo-reference the images to the corresponding location and index them based on required search fields. *(2010 - ongoing)*
- Create a computer application to allow sanitary system pumping reports in the Zoning office to be input through a Web Application, validated by Zoning staff, and made available through a computer query and display system. *(2012-2014)*
- Take advantage of the Register of Deeds document management system and further integrate with the GIS, particularly for plats and CSMs. *(2011 - ongoing)*
- Ensure that the County is ready to receive and process Electronic Recording of plats, Certified Survey Maps and other documents. *(2011 - ongoing)*
- Develop a Permit Tracking system that integrates with GIS for use in the Highway Department. *(2012 - ongoing)*

- Scan, index, make scans available online, archive old and **historic maps** and surveys to preserve the original documents from the elements and further abuse. *(2014-2015)*

Goal: To create a better work flow for the collection of Addresses from the various municipal Addressing Administrators and a system for combining and storing the addresses in the County's central GIS database.

Objectives

- Set up a team consisting of County and Municipal staff to study the current work flow, evaluate requirements, assess needs, determine resources and recommend a better approach and system for address management. *(2011)*
- Set standards to improve data compatibility between GIS, 911, Sheriff and other systems used by the state and federal government *(2010-2011)*
- Evaluate the use of an online GIS web application to enable determination of address numbers relative to the various grids and existing addressing. *(2011)*
- Create a secure online web application to enable uploads of new addresses. *(2012)*

Goal: To further enhance and/or integrate existing Land Records and GIS datasets using Relational Database Management Systems (RDBMS) wherever possible in order to facilitate integration and reduce duplication; and to develop new datasets and products as needed.

Objectives

- Continue to maintain and update as needed the **land information** housed in the County's GeoDatabase, including the "**Foundational Elements**" outlined by the Wisconsin Land Information Program (geodetic control, streets, addresses, aerial images, etc). *(ongoing)*
- Further develop **RDBMS design standards** for all GIS datasets, where appropriate, in order to create linkages between maps and data and to eliminate duplication. *(ongoing)*
- Revitalize the Technical Subcommittee or constitute a new **GIS Database Maintenance Team** that meets on a regular basis in order to collaborate on projects, training, workflows, etc. *(2010-2015)*
- Develop agreements and arrange to exchange data with the various Municipal Assessors; incorporate **assessed housing information** (year built, square footage, etc) with the GIS parcel mapping and make the data available on the County's internet mapping site. *(2012-2014)*
- Develop agreements and work flows to exchange **Municipal Zoning data** with the various municipalities; incorporate the Zoning data into the GIS

parcel mapping and make it available on the County's internet mapping site. *(2012-2013)*

- Maintain the survey framework / Public Land Survey System (**PLSS**) and parcel map at present or higher quality to support both CAD and GIS customers. *(ongoing)*
- Examine and revise the Filing and Indexing system for all **surveys**; create an efficient work flow to enable efficiently store and access all survey documents. *(2011-2012)*
- Evaluate and rebuild the County's **Street Indexing system**; Build a **master street name database** that relates to all required applications (GIS, MSAG, etc). *(2012-2014)*
- Incorporate 2 miles of the **neighboring county's street network** into Brown County's GIS GeoDatabase to facilitate 911 dispatch near the border and also to make network routing more accurate. *(2011-2012)*
- Obtain high-resolution **aerial photo** images in 2010 and in 2015 to continue on a 5-year schedule. *(2010 & 2015)*
- Obtain other aerial photos and **satellite images** as they become available from other sources and make them available on the County's GIS. *(ongoing)*
- Evaluate "Oblique-view" (**bird's eye**) **aerial images** and if possible, obtain updated images and the software required to extract more information from them. *(2012-2013)*
- Continue to maintain **Plat Book** data as a GIS layer, automate the updates of the data layer using the parcel mapping, and publish a printed plat book on an annual basis. *(ongoing)*
- Update the **ESA (Environmentally Sensitive Area)** GIS layer using the revised wetland inventory and the plat ESAs; develop a better ESA data layer maintenance work flow based on new ESA definitions. *(2011-ongoing)*
- Create and maintain a **Floodplain "Working Map"** to display DNR and FEMA-approved changes to the published floodplain panels; set a standard for flood study submittals; integrate the flood mapping changes into the GIS database and display on the web mapping site. *(2010-ongoing)*
- Obtain **building footprints** of the entire county with "height" values interpolated through the 2010 LiDAR dataset. *(2010 & 2015)*
- Digitize from air photos or obtain through contracted services the **impervious surface planimetric mapping** of the entire county for use in storm water management and other applications. *(2013-2015)*
- Ensure the "**Acreage**" values are consistent between the Land Records, GIS database, and the assessor databases. *(2011-ongoing)*
- Be prepared to react to a potential **Countywide Assessment System**. *(2012-2015)*
- On the Internet GIS site, map and advertise **Tax Delinquent parcels** and **Sheriff Foreclosure Sales**. *(2012-2013)*

- Develop a **culvert inventory** for the Highway Department. *(2014-2015)*
- Create and maintain “**metadata**” for each dataset; make the metadata searchable online. *(ongoing)*
- Work with cellular phone providers to create a work flow to allow the County to maintain a GIS layer showing the location of all **cellular phone towers** (for use in 911 and other operations). *(2012-ongoing)*

Goal: To develop a long-term budgeting strategy for the Land Records Modernization Account and create policies to help guide the expenditures of these funds.

Objectives

- Continue the formal budgeting process that allows the LIO group to develop the annual budget consistent with goals and objectives of the Land Records Modernization / Land Information 5-Year Plan. *(ongoing)*
- Broaden LIO revenue sources beyond the LIO funds (recording fees & data sales) by leveraging grants, partnerships, tax levy, or other sources. *(ongoing)*
- Update the Land Records Fee Schedule in the budget book in accordance with the new “Flat Fee” legislation (Wisconsin Act 314 of 2009, state statute 59.72); utilize the new “Public Access” fees to put more information online for free public access. *(2011)*
- Budget for interns on an annual basis, particularly in the Planning and Land Services Department, where interns can gain a wide range of experiences ranging from surveying and GIS to planning and zoning. *(2011-ongoing)*

Goal: To maintain and enhance the organizational structure of the Land Information Office (LIO) and to utilize LEAN initiatives and technology to help streamline various procedures and eliminate unnecessary tasks and duplication of effort.

Objectives

- Reconstitute the oversight Land Information Office (LIO) Committee to become the “Land Information Council” (LIC) and change membership of it as required by 2009 Wisconsin Act 314 *(2010)*
- Maintain the LIO/GIS Coordinator position to maintain and enhance both administrative and technical aspects of Brown County’s Land Records / Geographic Information System (GIS). *(ongoing)*
- Ensure adequate staffing to meet the needs and implementation of this plan, as well as the day-to-day technical tasks associated with the increasing service demands. *(ongoing)*

- Maintain central location for all mapping and GIS activities. *(ongoing)*
- Evaluate the policy regarding the display of “land owner name” on the County’s web sites; potentially create an “opt-out” system to allow people who don’t want their property to be searched by their name to opt out of the system or in some other way alleviate their concerns about privacy. *(2012)*
- Identify, encourage, and nurture relationships with state and local legislators to help them understand the importance of our program and to ensure their support. *(ongoing)*
- Enable the LIO to “look to the future” to keep current on GIS technology. *(ongoing)*

Goal: To ensure that staff are adequately **trained** in the efficient use of GIS, GPS and related technologies.

Objectives

- Further train the Public Safety & Communications staff on editing GIS datasets pertaining to their operations (common places, street centerline, and boundary layers) and on the use of Mobile GIS/GPS technology. *(2011 - ongoing as needed)*
- Train the Emergency Operations staff to enable updates on their end for pertinent GIS layers (outdoor warning sirens, shelters, chemical facilities, critical infrastructure, etc). *(2011 - ongoing as needed)*
- Train Highway Department staff to use GPS and maintain GIS datasets pertaining to their operation (sign inventory, permit tracking, etc). *(2011 - ongoing as needed)*
- Ensure there is an LIO budget available to send staff to training classes and professional conferences as needed. *(ongoing)*
- Revitalize the Technical Committee and other ad hoc committees. *(2010 - ongoing as needed)*
- Create a “Self Help” / Frequently Asked Questions (FAQ) page on the County’s web site that helps answer a lot of the land records-related questions often asked by customers. *(2011)*

Goal: To increase our capability to create “fly-through” and “walk-through” 3D visualizations to support planning and other activities.

Objectives

- Prepare the LiDAR data to be used for modeling building heights, tree canopies, terrain surfaces, and other 3-dimensional features. *(2011-2012)*

- Further develop the capability to provide 3D visualizations and “what if” renderings for planning projects such as street designs and future land use. *(2011-ongoing)*
- Purchase 3D rendering software as needed (Google SketchUp Pro, ArcGIS 3D Analyst or other new software). *(2011-ongoing)*

Needs, Priorities, and Timelines

As mentioned earlier, the above Goals and Objectives are based on an assessment of the internal and external customers’ needs. The priorities and timelines are marked in red parentheses for each of the above items; these were set by the Land Information Committee in Summer 2010. Some of these objectives will constitute rather large projects which will require sub-plans and detailed work plans. Some of these larger projects (particularly the new initiatives) are addressed in the next section of this Plan.

At this point, the *Instructions for Preparing County Land Information Plan* asks we answer the following additional questions:

a) Q: *What data or information does the county need that it currently uses or can acquire from other state or local sources?* A: The County utilizes several datasets from other sources including local municipalities, state and federal agencies, as well as private sector businesses. At this time, the County is not having any problem with obtaining data preventing us from implementing this plan.

b) Q: *What data or information does the county need that it does not have and are not easily acquired? What obstacles exist to acquiring this information?* A: Some of the data the County is looking for was determined during the Needs Assessment and is reflected in the Goals and Objectives above. For example, new State and Federal storm water management requirements may necessitate the acquisition of “impervious surface” mapping. The primary obstacle to acquiring most of these datasets is the time required to collect the data and the associated cost.

c) *How is or will the county ensure that county-maintained land information is, or can be made available in a standard industry format for use by others?* A: The County’s selected GIS software vendor is Environmental System Research Institute’s (ESRI) ArcGIS and related products, which is the GIS standard for almost all other government agencies across the state and across the nation. ESRI supports Open GIS data transfer and data sharing requirements as defined by the Open GIS Consortium. Files can be converted to AutoCAD, Microstation, Adobe PDF, Microsoft Access, Excel, SQL Server, and many other mapping, GIS and data formats.

d) Q: How is or will the county ensure that the land information it has is geographically referenced for use by others? A: Brown County's geographically referenced data is based on the Wisconsin County Coordinate Reference System, specifically the Brown County Coordinate System, which is mathematically relatable to the North American Datum (NAD) 1983(1991) and able to be referenced by use by others. Vertical GIS data is referenced to the North American Vertical Datum of 1988 (NAVD88). The Brown County Coordinate System is described in the booklet entitled Wisconsin Coordinate Systems" published by the Wisconsin State Cartographer's Office.

e) How is or will the county ensure currency and continued maintenance of its digital land information? A: The Brown County Land Information Office was moved into the Planning and Land Services Department in 2005 in order to physically locate the GIS/LIO Coordinator near the primary data custodians (Property Listing, Survey, Planning, and Zoning) so that ongoing training, education, and work flows can be continual. This arrangement also enables the GIS/LIO Coordinator to be part of the work flow and central to the data production environment to ensure that currency can be maintained.

2. Technology platform, database design standards and practices

The technology environment utilizes Microsoft SQL Server as the RDBMS (Relational Database Management System) with ESRI's ArcGIS Server Spatial Database Engine (SDE) to ensure stable, secure GIS database design and integration with tabular information systems. Over the next 5 years, this plan calls for a more enhanced system with tighter RDBMS standards and replication technology to separate the "production" environment from the "publication" environment to allow for a more fail-safe, secure, better performing GIS editing and viewing environment. The user needs analysis revealed some additional upgrade requirements to our technology platform, these upgrades are reflected in the Goals and Objectives above.

B. Progress Report on Ongoing Activities

Brown County's Land Information System is well past the initial implementation stage and has reached maturity in many areas. Many of the goals and objectives listed in the previous Land Records Modernization Plan have been met, while other areas still need work.

Below are a few of the most significant accomplishments and ongoing activities:

1. Progress towards "Enterprise GIS"

Changes in County Department organization opened up the door for significant progress towards our "Enterprise GIS" goals. In 2005, the Planning Department merged with Survey/Property Listing, Zoning and Land Information to create a new "Planning and Land Services" Department. Previously, these departments were spread out between 3 different buildings and 2 different computer networks. As a result, many work flows and datasets were fragmented and departmentalized. After the department merger, we completely redesigned the GIS into a more integrated GeoDatabase that implemented modern Relational Database Management System (RDBMS) standards.

Also, since most of our GIS editors were located on the same floor, our workflows could be overhauled. A big part of this involved parcel mapping workflow changes discussed in the next section below, but another big part of this project was integrating the large amount of GIS data maintained by the Planning Department which had previously been on a different computer network and stored most of the GIS data in project file-based

structures that were not easily accessible to all users. Remote departments who use GIS regularly (Land Conservation, Highway and Public Safety) were also brought into the "Enterprise" by way of an upgrades to the computer network which allowed them to connect to the central database. Other internal and external users of the system realized significant improvements

What is "Enterprise GIS"?

GIS has emerged as an essential "enterprise" technology for many organizations, meaning it supports many different functions throughout the organization. Enterprise GIS focuses on efficient storage and retrieval of all of the organization's relevant geographic information so that many different people who need the information can easily access it in whatever format is required. What makes GIS superior to other computer technologies is the ability to integrate maps and data and perform "spatial analysis"; in other words, combine and transform large amounts of raw data into visual, easy-to-use information. In Brown County, GIS has proven to be a key support system for many of the County's most basic services and thus our overarching goal within our land information plans has always been to build towards that goal.

in the information offered via the Land Information Website, particularly the GIS interactive mapping site. These were all very significant steps allowing us to achieve our goals of having a fully integrated “Enterprise” GeoDatabase.



2. Parcel mapping improvements

As mentioned above, one of the most significant achievements of our previous plan was the integration of GIS into our parcel mapping workflow. Over the last 5 years, the Survey and Property Listing staff was extensively trained in GIS. The parcel map is now updated daily directly within the GIS, which enabled the parcels to act as a true seamless GIS “base map” so that connections to other GIS map layers could be implemented. This was a huge step towards our overall goal of “Enterprise GIS”. Our solution involves drafting in CAD to take advantage of the strengths of AutoCAD and to enable us to continue to support our large number of AutoCAD customers who need up-to-date CAD drawing files. Property Listing staff discovered an innovative way to merge the CAD lines directly into the GIS without duplicating effort.

3. AS/400 Land Records System redesign

We have not yet moved our Land Records tax assessment database from the AS/400 platform to a GIS or Windows platform. The problems with a full conversion are discussed in the next section (“New Initiatives”) below. However, we have achieved some

success in integrating the AS/400 records with the GIS and mapping. For example, the Information Services Department wrote a script which runs nightly to convert the AS/400 tables to the GIS database, so that the parcel records can be joined to the GIS parcel map. This keeps information current and has at least partially satisfied the needs of most users. However, this configuration is not ideal because it is impossible to build true integration between these very different systems, which leads to some duplication of effort and other issues such as data inconsistencies.

4. Document Imaging Upgrades

The Register of Deeds (ROD) office has significantly modernized the real estate document recording process over the last 5 years. For example, Brown County was the pilot for “E-Recording”. In August 2009, state law allowed RODs to accept conveyances electronically. Today, the process has been greatly streamlined with automated functions such as auto-verification and auto-indexing. With nearly 1 million real estate documents (3.7 million images) in the system today, these modernization efforts were crucial in order to efficiently store, search and retrieve information. Most of the automation is done using the Fidlar document management system.

5. Foundational Element development

In addition to the parcel base map, most of our other “enterprise” GIS data layers have also been enhanced and updated as part of the conversion to the “v2” GeoDatabase. Hydrography, Land Use, Street Centerline, aerial photos, and many other “foundational elements” were completed and built into the central SDE GeoDatabase.

C. New Initiatives

1. Proposed Projects

The Goals and Objectives listed in the section above represent both new initiatives as well as ongoing land records modernization activities as determined by the Needs Analysis. The *Uniform Instructions for Preparing County Land Information Plans* calls for more detail on new or proposed projects in this section. Below, we have listed new initiatives of particular note and scale are describe in more detail:

a) New GIS servers and design enhancements

Many computer server hardware and software upgrades as noted in the goals and objectives are required in order to allow for the continued development of the Enterprise GIS. In 2010-2011, new 64-bit GIS server upgrades are planned. These servers will have the latest version of Microsoft SQL Server and ArcGIS Server software. A new initiative is to separate the “Production” (edit) database from the “Publication” (viewer) database to allow for a more fail-safe, secure and better performing GIS editing and viewing environment. “Replication” tools will be used to keep the databases in synch. GIS data production including “foundational” data such as the parcel map will be further improved using Workflow Manager software tools. We will continue to update and further modernize other countywide “Foundational Element” land information datasets described in the Goals and Objectives above and also in the next section of the Plan.

b) Revised “BrownDog” custom ArcMap application

Our popular custom add-on to ArcMap, affectionately known as the “BrownDog”, has reached the end of life because it was programmed using the soon-to-be obsolete VB6 programming (which is not supported by Windows 7 or ArcGIS 10). Because the “BrownDog” code made using ArcMap users so much more efficient with routine tasks such as running queries, managing map layers, creating map layouts, and so on, we plan to replace the “BrownDog” with some new custom programming developed in VB.Net or other modern programming code.

c) New Survey Index system using GIS

The survey function of the Property Listing Department files and maintains all sorts of miscellaneous surveys, section summaries, tie sheets, and other documents that are not

currently part of the Register of Deeds indexing system. We propose project involves the completion of the survey index map with “hot links” to the survey document pertaining to the geographic index.

d) Integrate more Assessment data into the County system

Property assessments are conducted by the municipalities (either in-house or by contract). While some of the municipalities make the assessment data available online, not all assessors make the data available consistently or with an easy-to access system. The County plans to continue to share data with the assessors and also, as a new initiative, receive more data fields back from the assessor to make more of those records available on the County’s web site to make the information more accessible to various users. Data fields such as the building characteristics (year built, square footage, etc) are commonly requested. Most (if not all) of the assessors are using computer systems with the basic Relational Data Management capabilities, which means the records can be fairly easily merged with the County database. This will require significant cooperation between the County, the Municipalities, and the contracted Assessors.

e) New GIS web applications helping to save time and money

Given our new ArcGIS Server web mapping platform, we plan to expand the number of services from basic land records and map queries to include more specific applications. For example, the Emergency Management staff would like to create a web-based GIS application to allow the public to look up properties in relation to hazardous chemical storage facilities to see what might be in their neighborhood (this falls under the Emergency Planning and Community Right to Know Act, or EPCRA). Other GIS web applications should allow county staff and others to more easily upload lists of sites pending inspections or other on-site services (plowing, collections, health services, etc) and calculate a “best route” driving direction to help save county time and money on fuel. Other web applications that involve mapping are also planned. A Sheriff Foreclosure Sale map would be popular, for example, especially if related information such as description and terms, is attached.

f) Expand use of Mobile GIS/GPS

Related to the item above is integrated GPS (Global Positioning Systems). With the expansion in the use and functionality of

GPS and “smart phone” technologies, Brown County is poised to take advantage of these tools to enable field crews and the general public to access land records and map data while on site, and also to collect updated data for synchronization into the central database. This technology is especially important for major county programs such as emergency response, inspection, and other on-site services . Also, given the new revenues offered by the “Public Access” fees, expectations for this type of modern service are quite high among many external customers including Realtors. As a prerequisite, this will require an upgrade to ArcGIS “Enterprise Advanced” server, which is planned for 2011. We also plan to acquire mobile computer units for certain field staff such as the Zoning staff. We plan to evaluate and potentially purchase the “ToughBook” portable computers (or equivalent units) which have built-in GPS receivers as well as full GIS viewing and editing capabilities. Likewise, the Needs analysis called for better mobile mapping/GPS units within the Sheriff Department squad cars.

g) Expand the Document Imaging & Management System to include more land record documents, including Surveys and Permits (sanitary / POWTS, highway, etc) and link it to the GIS.

While this is an ongoing activity, we plan new initiatives where the records are submitted electronically so that there is less need to file paperwork and/or scan the documents. For example, one planned new initiative involves a computer application that allows sanitary system pumping reports to be input through a Web application, validated by Zoning staff, and made available through computer query and GIS display system.

h) Addressing work flow overhaul

There are over 20 “addressing administrators” in the County who do the physical assignment of new or modified street addressing. The addresses must then filter in to the County’s central database where they are used for many purposes ranging from tax listing to E-911. Brown County has taken some steps to streamline this process but more work needs to be done. For new initiatives, we envision creating a central “address collection system” where all addresses are more effectively filed with the county for use by 911 and other purposes.

i) Obtain additional aerial orthophotography .

While the 2010 high resolution aerial photography project is on schedule at the time of this plan writing, we plan to acquire additional images as they become available from other agencies over the next five years. We also plan for a County high-resolution flight in 2015, depending on what is available from other agencies and resources. In addition, since the historic photos we have already converted to digital orthophoto GIS layers (1938, 1960) have proven to be very useful and extremely popular, and so we plan to convert other air photo collections from other years (1967, 1972, 1979, 1990) into GIS format and make them available via the web mapping site. Subject to available resources, we may also acquire new “birds eye” (oblique angle) images of the County.

j) Impervious surface mapping for all of Brown County
“Impervious surfaces” (building footprints) would be extremely useful for many activities such as floodplain determination, addressing, emergency management, E-911 response, facility mapping, permitting, tax assessing, real estate tracking, 3D modeling, and many other land records projects. The mapping of impervious surfaces would also help with stormwater management and other projects, but probably would not have as much value as building footprint mapping.

k) Replace the AS/400 with a Windows-based, GIS-compatible system

This will be a very significant project requiring coordination with Information Services and others. Resources for this large project may not be available until at least 2014. A more detailed work plan will be needed to fully scope out this initiative.

2. Assistance Requested

The County may request the Wisconsin Department of Administration to assist in many of the above initiatives, particularly with technical assistance, financing, and policy. Below are some specific answers to questions that the *uniform instructions for preparing county land information plans* wanted us to address:

a) Technical Assistance: Please continue to maintain and improve the “LIO-Tech” email list service.

b) Financing: Brown County relies heavily on the program fees; very few levy dollars are available for the land

information program. It is the County's intention to implement this plan using non-levy program revenues.

c) Access to land information: Given the "Public Access" revenues statutorily available to us, the County will provide free access to all land information through web sites as well as FTP sites and other specialized online applications.

d) Statewide GIS repository: Brown County will participate in the statewide GIS repository when one is made available.

e) Procurement: Brown County strictly adheres to competitive procurement (RFP) policy. All significant contracted services are put out to bid or RFP process. Brown County is consistent with the State of Wisconsin in this regard.

3. Problems Encountered.

Since Brown County started modernizing Land Information over 20 years ago, some of the common barriers to implementing our plans include:

a) Staff training in the field of ever-changing technology is hard to stay on top of. More education & training is needed.

b) Several projects have been delayed or compromised due to various factors, the biggest obstacle being staff shortages and budget cuts while at the same time everyone's work load increases. The leaders in the organization have to consider the importance of land information because virtually every project and policy within government and business has spatial or geographic components.

c) At times, we have been simply telling people that we need to modernize, integrate, or change without providing the reasons why. We need to do a better job of teaching people why this program is important and needed because this lack of communication creates uncertainty and lack of focus.

d) Too often the presence of GIS staff is seen as the only people that need to be doing GIS for the organization. In order for the enterprise-wide GIS to flourish, the organization must realize that some of the GIS responsibilities must be delegated to existing staff inside or outside of the organization.

e) Departmental staff often mis-interpret the importation of their department's data into the single central "enterprise" GIS database as someone else "taking over" their data, when actually the idea is to maintain existing workflow & maintenance only on a shared system. This segues into the "Custodial Responsibilities" in the next section. We have to do a better job of communicating the benefits of a single, shared database and ease concerns people may have of this system.

D. Custodial Responsibilities

Following are Brown County Departments and their land record responsibilities. The authority for custodianship is noted in parentheses

1. Register of Deeds

- a. Record/File/Index deeds, mortgages, plat maps, certified survey maps, and other related documents (§59.43)
- b. Scan above mentioned records into our imaging system as they are received and filed (§59.43)
- c. Maintain tract index of real property (§59.43)
- d. Scan/File/Index other documents such as Vital Records that are not associated with the Land Information Program

2. Treasurer

- a. Maintain digital & hardcopy tax information for all parcels
- b. Maintain digital & hardcopy tax rates and special assessment information (§70.09)
- c. Sell hardcopy plat books

3. Planning and Land Services Department

a. Survey & Real Property Listing Division

- i. Maintain description and ownership information of all parcels of property (§70.09)
- ii. Maintain the digital & hardcopy parcel maps
- iii. Maintain information on school and other special district codes (§70.09)
- iv. Maintain information on PLSS corners including tie sheets and section summary sheets (§59.74)
- v. Maintain information on the High Accuracy Reference Network (HARN) (§59.74)
- vi. File private survey maps (§59.74)
- vii. Maintain digital survey map index

- viii. File field notes and other survey source documents (§59.74)
- ix. Compile & maintain county-wide street addressing

b. Land Information Office Division

- i. Implement the Land Information Plan (§59.72)
- ii. Design & Support a countywide GIS database (§59.72)
- iii. File and maintain aerial photos & digital orthophotos
- iv. File and maintain digital soils maps
- v. Maintain digital hydrography mapping
- vi. Maintain digital Street Centerlines and addressing information
- vii. Centralize & distribute a countywide GIS parcel map
- viii. Maintain digital fire, police, EMS and other E-911 response layers
- ix. Centralize & distribute digital FEMA flood mapping
- x. Centralize & distribute digital DNR WI Wetland Inventory Maps
- xi. Collect, Centralize & Distribute digital elevation data
- xii. Maintain the GIS server, computers, and computer network
- xiii. Maintain the Internet / Public Access sites
- xiv. Coordinate the programming of GIS applications
- xv. Train users on GIS and land information systems
- xvi. Publish the plat books

c. Planning Division

- i. Maintain hardcopy & digital sewer service area maps
- ii. Maintain hardcopy & digital plan maps
- iii. Maintain hardcopy & digital land use & future land use maps
- iv. Serve as local point of contact to the U.S. Census Bureau
- v. Maintain hardcopy & digital supervisory district maps
- vi. Maintain hardcopy & digital voting ward maps
- vii. Maintain digital ZIP code maps
- viii. Help maintain Street Centerline & addressing digital & hardcopy maps
- ix. Maintain comprehensive plans
- x. Maintain municipal zoning maps (digital & hard copy)

d. Zoning Division

- i. Maintain private sanitary system site plans (§59.69)

- ii. Maintain permit database
- iii. File hardcopy floodplain & flood study maps
- iv. Manage a public access terminal to help display digital floodplain, wetland, topography, and other GIS layers
- v. File hardcopy Wetlands maps
- vi. File Well location reports

4. Land Conservation Department

- a. Maintain digital & hardcopy agricultural field maps
- b. Maintain digital & hardcopy watershed maps
- c. Maintain Animal Waste Management Ordinance permitted facilities
- d. Maintain riparian buffers installed under the Shoreland Protection Ordinance
- e. Maintain installed conservation Best Management practices

5. Highway Department

- a. File right-of-way plats and construction plans
- b. File bridge as-builts and engineering documents
- c. Maintain a street sign inventory
- d. Maintain the PASER database

6. Public Safety & Communications Department

- a. Maintain Common Place GIS features
- b. General E-911 maintenance as it relates to the GIS (street centerline edits, beat updates, etc)

7. Emergency Management

- a. Maintain outdoor warning siren GIS features along with 'soundsheds'
- b. Maintain "critical infrastructure" GIS features (hazardous materials storage sites, day cares, schools, shelters, etc)

8. Sheriffs Department

- a. Incident "pin" mapping related to accidents, crime mapping, etc

9. Cities, Villages & Towns within Brown County

- a. Establish street addressing
- b. Maintain hard copy and/or digital municipal zoning maps
- c. Maintain Tax Assessment data and upload it to the County tax assessment database (some outsource this)
- d. Maintain Building inspection data
- e. Maintain hardcopy and/or digital Water system mapping

- f. Maintain hardcopy and/or digital Sanitary sewer system mapping
- g. Maintain hardcopy and/or digital Storm sewer system mapping
- h. Maintain hardcopy and/or digital Tree Management data
- i. Maintain hardcopy and/or digital Road Inventory (pavement, etc)

E. Framework Data, System Implementation & Statewide Standards

The Wisconsin Land Information Program has defined a specific and critical set of land information called “Foundational Elements” and a corresponding set of state-wide standards relating to a specific subset of land information. All Foundational Elements are fundamentally important and interrelated. They are listed below along with the relevant state statute (if applicable).

1. Geographic Positioning Reference Frameworks

This includes the mapping of: Geodetic Control Networks, PLSS (section corner, etc) monumentation & coordinates, geographic control data, digital orthophotos and elevation models. The Brown County Survey Division of the Planning & Land Services Department has taken the lead in many aspects of this element.

a) Geodetic Control Networks

Progress: With assistance from the Wisconsin DOT, municipal and private surveyors & engineers, Brown County has developed and densified a HARN (High Accuracy Reference Network) using Federal Geodetic Control Subcommittee guidelines.

Standards: Four Primary Stations (1 ppm), 36 Secondary (2 ppm) and over 50 Tertiary (10 ppm) stations have been established in Brown County through 2010. A Vertical Geodetic Control network is also in place, and it is based on the National Spatial Reference System. All 1st, 2nd, and 3rd order NGS monuments have been recovered; GPS coordinates and elevations have been captured on about 170 of these (through 2005). The Wisconsin County Coordinate System (Brown) is used as the primary coordinate system for these and all other County-maintained datasets. In 2006 the Wisconsin Land Information Program funded the creation of the Wisconsin

Coordinate Reference Systems (WisCRS). WisCRS is a redefinition of the Wisconsin County Coordinate System uses GRS 80 as the single reference ellipsoid for all the individual coordinate systems. The five WisCRS design parameters are exactly equal to these same parameters in the Wisconsin County Coordinate System so there is no coordinate shift between the two systems. As such, the North American Datum of 1988 (NAD 83(91)) is the primary horizontal datum for all digital GIS and CAD data; most or all partners and local engineers/surveyors/etc adhere to this standard. This ensures the highest degree of compatibility for coordinate geometry applications. The North American Vertical Datum of 1988 (NAVD 88) is the primary vertical datum used for surveying and GIS by the County and most partners.

b) Public Land Survey System (PLSS)

Progress: As of 2010, over 80% of the PLSS corners in the County have been remonumented to meet or exceed the 1970 Wisconsin Statute (§59.74 & 60.84) requirements. In the mid-1990's, the County Survey Department conducted an extensive ground traverse GPS survey in order to tighten the horizontal control of all coordinate points across the county. Least squares adjustments were used to reduce systematic error. In 2009 the county acquired new global navigation satellite system (GNSS) equipment and the technology to use the Wisconsin Department of Transportation virtual reference system. The new equipment along with funding from the Wisconsin Department of Transportation is leading to remonumentation of the Private Claims at Green Bay on the west side of the Fox River.

Standards: Brown County maintains a high level of standard creating and maintaining coordinate accuracy. These high standards are particularly important to Brown County because A) It is the oldest settlement in the state where land survey systems pre-date the standard rectangular PLSS; and B) These primitive land division systems exist in some of the most densely populated areas of the state, where precise land ownership parcels are very important.

Custodian: Brown County

Data currency: Updated frequently

Archives: Fully archived.

2. Orthoimagery and Georeferenced Image Base Data

a) Photogrammetric base maps

Progress: Much of western Brown County was mapped with photogrammetric base maps in the late 1980s, and these maps have been scanned and some georeferenced for use in the GIS.
Standards: Hard copy mapping was done at a 1" = 200' horizontal scale. 4' contour mapping with supplementary 2' contours compiled by stereophotogrammetric interpolation.
Custodian: Brown County
Archives: Filed as both hard copy and digital scans.

b) Digital orthophotography (DOP)

Progress: Completed & incorporated into our Enterprise GeoDatabase. Through contracted services or other agencies, Brown County has obtained countywide digital aerial orthophotography for several different years, including 1938, 1960, 1992, 2000, 2005, 2008, and 2010.
Standards: Each dataset had slightly different standards, but our high resolution flights (2000, 2005, and 2010) were completed at a 6" ground resolution and tested to meet National Map Accuracy Standards (NMAS) for 1" - 100' mapping (NSSDA Accuracy is 3.84' or better). The historic images (1938 and 1960) meet NMAS standards for 1" = 200'.
Custodian: Brown County
Updates & Archives: Brown County conducts a high-resolution flight on a 5-year schedule; all photos are archived digitally and most in hard copy as well.

c) Digital Raster Graphics

Progress: Completed & incorporated into our Enterprise GeoDatabase. DRGs (scanned, geo-referenced USGS topographic quadrangle maps) were obtained by the WiDNR, projected to County Coordinates, and seamlessly mosaicked into our GIS data repository.
Standards: Most DRGs are a set scale of 1" =
Custodian: USGS (source mapping) DNR (digital raster)
Updates and archives: Brown County updates DRGs into the County's GIS as new ones become available from USGS and DNR.

d) Satellite Imagery

Progress: Brown County has not used satellite imagery because of its low resolution and atmospheric obstructions (clouds, haze, etc).

e) Oblique aerial imagery

Progress: “Pictometry” has flown Brown County and Microsoft has purchased the images for use in the Bing / Virtual Earth “Birds Eye” image catalog online. Brown County has not put any money towards this project, but we have built links from our GIS to the “Birds Eye” and Google Street View images online and many people use this integration frequently.

Standards: n/a

Custodian: Pictometry, Microsoft

Updates: Pending resources, Brown County may be interested in partnering with Microsoft for an updated flight before 2015, as noted in the section above.

f) Historical Aerial imagery:

Progress: As noted above, the 1938 and 1960 aerial images have been scanned and converted to orthophotography.

Additionally, we have built a GIS index to all other historic photo sets (1948, 1954, 1967, 1972, 1978-81, 1986, 1990) so that the hard copy photos can be easily referenced for any given location and pulled from the files. Some photos are scanned and hyperlink to the index.

Standards: each photo set has a different scale

Custodian: Brown County, although many of these images are also housed at the National Archives in Washington DC.

3. Elevation Data Products and Topographic Base Data

a) Digital Elevation Models (DEM)

Progress & Standards: Completed & incorporated into our Enterprise GeoDatabase. Our April 2000 aerial flight yielded a DEM that varied in quality (the urban areas had a higher resolution DEM where 2’ contours were generated, while the outlying Towns had a lower resolution DEM that was built solely to support the production of digital orthophotography. Brown County’s DEM products are in the ESRI GRID format.

Custodian: Brown County

Updates: In April 2010, a LiDAR flight was conducted which will yield an updated, much higher resolution DEM as one of the deliverables. It is our goal to obtain new topographic/DEM data on a 10-year cycle, so the next project could occur in 2020.

b) Digital Terrain Models (DTM):

Progress & Standards: Completed & incorporated into our Enterprise GeoDatabase. Like the DEM, a DTM was generated from the April 2000 flight with variable resolution/quality

across the county (generally more detail in the urban areas, and less detail in the rural areas).

Custodian: Brown County. Copies of this dataset also reside within the municipalities that partnered with the county to complete 2' contour mapping for the 2000 flight.

Updates: The April 2010 LiDAR flight will also include a much higher quality DTM, this will be consistent high-resolution and quality County-Wide. This 2010 DTM will be delivered in AutoCAD, ESRI, LAS and other formats. This dataset was funded by a USGS grant and so copies will be available as free downloads through both the Brown County GIS web site as well as the USGS National Map online.

c) Triangulated Irregular Networks (TIN)

Progress & Standards: TINs have been generated from the April 2000 flight. The 2010 flight TIN will be integrated into the Enterprise GeoDatabase.

Custodian: Brown County

Updates: Once the new 2010 LiDAR data is available, we plan to build a "Terrain" Dataset within ArcGIS to efficiently store and access as this will be the most effective way to store and access this massive amount of data.

Archives: This dataset will be archived as part of the County's records retention plan and computer backup schedule.

d) Contours

Progress: The urban areas (about 40% of the county) had cartographic 2' contours generated from the 2000 flight. Other contours from earlier projects exist in Hobart and other areas in western Brown County. What is finished is integrated into the Enterprise GeoDatabase; the 2010 flight will be as well.

Standards: National Map Accuracy Standards for 1" = 200' mapping.

Custodian: The 2000 contours were done as a partnership between the County and the Municipalities. The 2010 flight is being coordinated by Brown County with funding through a USGS grant.

Updates: The 2010 LiDAR flight will yield Countywide 2' contours, but they will not be the "Cartographic" contours (they will simply be computer-generated, limited "smoothing" or other human editing).

e) LiDAR data

Progress: As mentioned above, Brown County conducted an elevation mapping flight using LiDAR "Light Detection And

Ranging” in April 2010. Many derivative elevation products (contours, DEMs, TINs, etc) will be derived from the LiDAR data as deliverables, and the raw LiDAR data (both “first return” as well as “bare earth”) models will be delivered.

Standards: The LiDAR project will have nominal pulse spacing of at least 1.8 meters countywide and will meet ASPRS Class II accuracy standards.

Custodian: Brown County. This project was paid for with a USGS grant, and so the dataset will also be available through the USGS web site (National Map).

Updates: Brown County foresees a need to update the LiDAR data on a 10-year cycle, so the next flight may be planned for 2020.

f) IFSAR data:

Progress: Brown County does not have any IFSAR data.

4. Parcel Mapping

a) Parcel Boundary Maps

Progress: Completed & incorporated into our Enterprise GeoDatabase. Completed county-wide (just over 100,000 parcels). All parcels have digital boundary lines drafted by coordinate geometry in AutoCAD as referenced to its source document, professionally analyzed, and precisely mapped into a geodetic controlled PLSS base, and also mapped into the GIS “GeoDatabase” format. Digital boundary mapping and annotation (text) mapping is complete, and the tax parcel polygons linked (via Parcel ID) to ownership and assessment information in GIS is also finished.

Standards: The mapping meets National Map Accuracy Standards for 1”=50’ mapping or greater. Imperfections or inconsistencies in the real estate records were identified. Accurate footage and areas provided by the precise parcel mapping translates to fair and equalized taxation across the county.

Custodian: Brown County Property Listing routinely maintains the parcel map. The digital parcel map contains high-quality annotation (text) that includes parcel ID, footage, document number, lot/block/subdivision names, and more.

b) All parcels across Brown County refer to boundaries of the PLSS and serve as accurate title boundaries.

c) Coordinate System Used

The **Brown County Coordinate System (NAD83/91)** is used for all parcel mapping.

d) Parcel ID

This is the key that links tax parcel polygons to many other related datasets. We are using the Brown County Parcel ID format. Brown County does not adhere to the WLIA’s Parcel Number standard, but we do meet or exceed the digital parcel mapping standards as well as FGDC’s Cadastral standards.

5. Parcel Administration and Assessment Information

a) Design: Brown County’s parcel map currently supports integration of the parcel maps with property ownership information by linking data through key fields, primarily the Parcel ID number. The tax roll and other tabular “land records” are maintained in an IBM AS/400. Each night, a script automatically converts the AS/400 tables to the GIS server so that fresh data is always available as linked to the GIS parcels.

b) Activities associated with modernizing the use of parcel level information once created from and in support of parcel maps:

(1) Parcel ID

The PIN (or PID) is created for every tax parcel as a database attribute on the GIS, and links to the parcel ID on the tax record database. This is the “primary key” upon which many other databases are related to parcels.

(2) Tax Data

The tax data is maintained on the AS/400. Special query tables called LRSWK402 are produced on the AS/400 weekly which creates standard tables which can be easily exported and linked to the maps, with many of the most common fields needed for GIS activities.

(3) Site Address

Progress: Completed. Site addresses are shown as text (annotation) on the parcel map. The address number on the parcel map has a relationship class to the address point as well.

(4) Owner Name & Address

This data is maintained in the AS/400 and is part of the GIS / GeoDatabase linkage to the map.

(5) Description/current document pertaining to the parcel

A conveyance document number is shown visually as text on the map, is included in the AS/400 database, and is combined into the GIS GeoDatabase.

(6) Document Imaging

In May 1996, the Register of Deeds began imaging documents relating to property transactions. As time & budget allows, documents from prior years are also imaged. The real estate images can be related to the land records & map via the document number, and starting in 2005 via the parcel number as well. Property Listing also scans all survey instruments that are not imaged by ROD, but these are currently not housed or indexed in the enterprise imaging system.

Also, section corner tie sheets are imaged and hyperlinked to the PLSS corners.

(7) Real Estate Transactions

The Register of Deeds records these transactions and maintains a grantor/grantee and tract index so that searches can be made by grantor (seller), grantee (buyer), legal description, document number, and other methods. Property Listing maintains the tax database to reflect these real estate transactions.

(8) Easements and restrictions, including conservation easements

The Register of Deeds records conservation, driveway, utility, & ingress and egress easements on a voluntary basis and indexes them based on grantor, grantee and legal description if provided.

(9) Tax exempt status

These are carried as a code in the AS/400 land records system which are converted & linked to the GIS parcels

(10) ZIP codes

Our tax database includes owner mailing ZIP codes with the 5+4 format.

(11) Assessment Class

These are carried as a code in the real property AS/400 tax database and are also linked to the GIS GeoDatabase as a 1:M "relationship class".

(12) Public Lands

Presently our system only tracks these lands under the tax exempt status, although Planning Dept. has extracted and coded GIS layers for Parks and other public spaces.

(13) Liens

The Register of Deeds records these transactions and maintains a grantor/grantee and tract index so that searches can be made by grantor, grantee, legal description or document number.

(14) Evidence of Title

Register of Deeds maintains all documents affecting title and maintains a grantor/grantee and tract index so that searches can be made by grantor, grantee, legal description or document number. Property Listing maintains the current and historic document affecting title.

6. Street/Road Centerlines, Address Ranges, & Address Points

a) Transportation network (streets, roads, highways, railroads, and trails):

Progress: Completed and housed in our county Enterprise GeoDatabase

Standards: The transportation network is spatially accurate and also meets the standards required for running network analysis (connectivity, vector directionals, overpass/underpass coding, etc).

Custodian: Brown County Planning & Land Services

Updates: Updated frequently as needed.

Archives: Archived according to the County's computer record retention schedule.

b) Rights of Way

Progress: Completed & incorporated into our Enterprise GeoDatabase. All public road right of ways (and some private also) are mapped and stored in both AutoCAD and within the Enterprise GeoDatabase.

Standards: Same as the parcel mapping (1" = 50' NMAS)

Custodian: Brown County Property Listing

Updates: Frequently as needed.

c) Street Centerlines

Progress: Completed & incorporated into our Enterprise GeoDatabase.

Standards: Same as the Transportation Network (see above)

Custodian: Brown County Planning & Land Services

Updates: Updated frequently as needed

d) Street Centerline Attributes (address ranges, names, etc).

Progress: Completed & incorporated into our Enterprise GeoDatabase. This is complete with left & right address ranges, street names, aliases, municipal and ZIP fields required for geocoding, as well as information on rustic roads, truck routes, bicycle lanes, drive time estimates, and more.

Standards: Meets E-911 requirements, geocoding requirements, and other requirements needed for our Metropolitan Planning Organization (MPO) for use in analysis, planning, and transit.

Custodian: Brown County Planning & Land Services

Updates: Updated frequently as needed.

e) Site addresses

Progress: Completed for all “primary” addresses county-wide. We are working to add “secondary” or sub-addresses.

Individual site addresses are located on the GIS map as points, and have feature-linked annotation as text on the map, and thus are also stored within a database. We are also working to relate the address points to other features (businesses, critical infrastructure, etc) as needed.

Standards: Same as parcel mapping.

Custodian: Each municipality is responsible for establishing addresses. They in turn send address information to Brown County Property Listing for input into our Enterprise GIS.

Updates: Frequently, as needed.

f) Address Points

Progress: Completed (see above).

g) Road/Street names

Progress: Completed & incorporated into our Enterprise GeoDatabase. All road names (public, private & proposed) can be found in the Street Centerline attribute table (primary names as well as “aliases”). Road names are also stored as text in the CAD model as well as fixed annotation in the ArcSDE GeoDatabase. They are also stored in the AS/400. Also, a street name list is available on the Land Information Office web site.

Custodian: Brown County Planning & Land Services

Updates: Frequently, as needed.

h) Functional Classification

Progress: Completed & incorporated into our Enterprise GeoDatabase.

Custodian: Brown County Planning & Land Services.

i) Landmarks / Common Places

Progress: Completed & incorporated into our Enterprise GeoDatabase. This is a Point layer that contains attributes of addresses & names of such places as businesses, parks, churches, schools, and other landmarks. This is used to help 911 callers identify their location by landmark. The “Common Places” have a “Type” field that can be used to query out or sub-classify the landmarks or points by type of location (eg school, park, police station, etc).

Custodian: Brown County Public Safety & Communications.

Updates: Frequently as needed.

j) MSAG

Progress: The Public Safety Department maintains and assures integration of the County’s street centerline with the phone company’s **Master Street Address Guide (MSAG)**.

Standards: Assurances are made that the data is in synch as required by the E-911 system.

Custodian: Brown County Public Safety & Communications

k) Emergency Response & Planning

Progress: Our street centerline is has been directly supporting emergency response since the 2001 when a new Computer Aided Dispatch system went on-line. This new system imports GIS data and uses the street centerlines to locate every address in the County and provide a Fire/Police/EMS beat recommendation based on geography / GIS overlay.

Additionally, we have been working with and participating in drills with Emergency Management to ensure our GIS is capable of supporting all types of emergencies as needed.

Standards: As required by Emergency Management.

Custodian: Brown County Planning & Land Services and Emergency Management

l) Wireless 911 support

Progress: The GIS street centerlines are uploaded into the Computer Aided Dispatch 911 system on a monthly basis.

Standards: Certain fields and standards are maintained on the streets to ensure compatibility.

Custodian: Brown County Planning & Land Services and Public Safety & Communications both access and help maintain the street data as required by the 911 dispatch software.

7. Hydrography, Hydrology and Wetlands mapping

a) Hydrography (lake and stream features)

Progress: Completed & incorporated into our Enterprise GeoDatabase.

Standards: Matches the accuracy of the latest high-resolution aerial photography (generally 1"=100' NMAS)

Custodian: Brown County Planning & Land Services and also the Land & Water Conservation Department. Wisconsin DNR hydro dataset is used as reference. Dataset is maintained in the Enterprise GeoDatabase.

Updates: Hydrography is updated whenever new air photos are obtained, as time permits.

b) Watersheds

Progress: Completed & incorporated into our Enterprise GeoDatabase. Includes sub-watersheds.

Custodian: Brown County

c) Hydrogeology

Progress: Brown County Land Information Office has been working in conjunction with the Land Conservation Department, UW-GB and others to obtain hydrogeology data.

d) Impacts on the Environment (air emissions, soil contaminants, coastal stability):

Progress: Certain groundwater contamination issues have forced us to build GIS layers related to groundwater, karst, and other features.

e) Wetlands

Progress: Completed & incorporated into our Enterprise GeoDatabase.

Standards: DNR Wisconsin Wetland Inventory

Custodian: The wetlands are maintained by the Wisconsin DNR, but the County maintains a copy of the Wisconsin Wetlands Inventory on the County's enterprise GeoDatabase.

Updates: Brown County is looking to enhance wetlands delineations with the use of color infrared aerial photography available from our April 2010 flight.

8. Soils Mapping, Land Cover, and other Natural Resource Data

a) Soils maps

Progress: Completed & incorporated into our Enterprise GeoDatabase. Brown County keeps a copy of this dataset inside its Enterprise GeoDatabase. The soils are also displayed on our Internet mapping site as part of the “Environment” layer.

Custodian: The USDA Natural Resource Conservation Service (NRCS).

b) Land Cover

Progress: Completed & incorporated into our Enterprise GeoDatabase.

Standards: Low resolution (WISCLAND 20 meter GRID)

Custodian: This dataset is not maintained by Brown County, (we generally maintain the related Land Use instead) but we have obtained the land cover datasets available through various State agencies.

c) Forests

Progress: Completed, stored as part of our Enterprise GIS and can be queried in our GIS system either through the Land Use layer and/or through our tax land class codes, which include Productive Forest Lands, Management Forest Lands, and Ag Forest codes

d) Geology

Progress: Incomplete. We have obtained some level of detail for geology mapping (both in surface features as well as bedrock) but more needs to be done to support needs for environmental planning and to help respond to problems related to ground water contamination.

Standards: The mapping we have needs to be refined to include more detail.

Custodian: Brown County is communicating with UW Green Bay’s Geology Department, the Wisconsin Geological & Natural History Survey (WGNHS), USGS and others to obtain new geology mapping as it becomes available.

e) Hydrogeology

Progress: Brown County does not maintain any hydrogeology layers (other than Karst) but we would like to obtain this data. We have had discussions with geology professors at UW-GB who are compiling this data.

f) Non-Metallic Mining

Progress: Brown County maintains a GIS dataset showing gravel and sand pits and other nonmetallic mining sites.

Custodian: Brown County Zoning.

g) Endangered Resources

Progress: Brown County has incorporated the State DNR “Endangered resources” layer.

h) Impacts on the environment

Progress: mapped using GPS and stored in the GIS as needed. We do have some information related to soil contaminants and coastal stability, but these are not comprehensive GIS layers.

9. Land Use Mapping

a) Existing Land Use

Progress: Completed & incorporated into our Enterprise GeoDatabase. Brown County has completed detailed land use mapping for the entire county.

Custodian: The Planning staff is the custodian of this data

Updates: Generally we update the land use as needed, but at minimum a countywide land use inventory is done in conjunction with the Census (every 10 years). A new land use map is being completed using 2010 aerial photography and other sources.

Archives: Brown County keeps “snapshots” of land use archived in the GIS system and as hard copy maps.

b) Future Land Use

Progress: Completed & incorporated into our Enterprise GeoDatabase.. Future Land Use maps of most of the county for use in the Comprehensive Land Use projects.

Custodian: Brown County Planning.

Updates: As needed

Archives: Brown County keeps “snapshots” of land use archived in the GIS system and as hard copy maps.

10. Zoning Mapping

a) Zoning Districts

Progress: Incomplete.

Custodian: Brown County does not regulate Countywide municipal zoning. However, the County does contract with several municipalities to maintain zoning maps and so we do have fairly current municipal zoning maps for much of the county . Additionally we can usually share the GIS datasets between municipalities that maintain zoning.

Updates: As needed

b) Shoreland zoning

Progress: Completed & incorporated into our Enterprise GeoDatabase.

Custodian: Brown County Planning & Land Services

c) Flooplains & Floodways

Progress / Custodian: Completed & incorporated into our Enterprise GeoDatabase. FEMA has recently completed a new Floodplain Zone map. Brown County has incorporated the flood mapping, where it is used frequently and made available online. Brown County complies with DNR Floodplain Zoning NR 115.

Updates: Brown County maintains “Letters of Map Amendment” and “Letters of Map Revision” (LOMA/LOMR) as both scanned images and as a GIS polygon layer used to index the documents and display where LOMA/LOMR exists. All of this information is available on the GIS mapping web site.

d) Environmental Corridors

Progress: Completed, but NOT part of our Enterprise GeoDatabase.

Custodian: Bay Lakes Regional Planning Commission

e) Burial Sites

Progress/Custodian: Mostly complete. Brown County has obtained burial site information from the Wisconsin Historical Society in GIS format. We do not make this information public, other than public cemeteries.

f) Archeological sites

Progress: Some completed. Brown County has obtained archeological sites as a GIS layer from various sources, but this is generally not public information.

Custodian: Wisconsin Historical Society and others.

g) Historic/Cultural sites

Progress / Custodian: Brown County has obtained this GIS dataset through the Wisconsin Historical Society. It is not public information.

11. Election and Administrative Boundary System

a) Election (Voting district) boundaries, precinct wards, supervisory district, and voting/polling places

Progress: Completed & incorporated into our Enterprise GeoDatabase. are all mapped and maintained within the Enterprise GIS.

Custodian: Brown County Planning & Land Services / LIO

b) Legislative Districts

Progress: Completed, but NOT part of the County's enterprise GeoDatabase. Shapefiles are available.

Custodian: State of Wisconsin

c) Utility Districts

Progress: Mostly complete. Sanitary Districts and Sewer Service Area map layers are housed in the County's GIS

Custodian: Brown County Planning & Land Services / LIO

d) School districts

Progress / Custodian: Wisconsin Department of Administration has completed a general school district map layer that we have a copy of. On a more refined level the County maintains School District code in each parcel.

e) TIF districts

Progress: Complete as TIF numbers are coded in each parcel.

Custodian: Brown County Treasurer

f) ZIP code boundaries

Progress: We have an inaccurate ZIP code boundary layer. As an alternative, we can use the ZIP codes built within our parcel mapping attributes.

Custodian: US Postal Service.

g) Census geographies

Progress: Completed & incorporated into our Enterprise GeoDatabase. (blocks, tracts, etc) are imported from the US Census Bureau into the County's GIS Database

h) Civil Division Boundaries (Municipal boundaries)

Progress: Completed & incorporated into our Enterprise GeoDatabase.

Custodian: Brown County

i) County Park boundaries and other County administrated lands

Progress: Completed & incorporated into our Enterprise GeoDatabase.

Custodian: Brown County Planning & Land Services

j) Native American Lands

Progress: Completed & incorporated into our Enterprise GeoDatabase. Oneida Reservation Boundary, as well as Oneida "Trust" and "Fee" land boundaries (with attached attributes) are housed in the County's GIS

Custodian: Brown County Planning & Land Services Dept.

k) County boundaries

Progress: Completed & incorporated into our Enterprise GeoDatabase.

Custodian: Brown County Planning & Land Services Dept.

l) State outline boundary:

Progress: Completed

Custodian: Brown County Planning & Land Services Dept.

m) Lake District boundaries

Progress: Not applicable. Brown County does not have any lake districts.

12. Critical Infrastructure and Facility management

a) Emergency Service Districts

Progress: Completed & incorporated into our Enterprise GeoDatabase.

Custodian: Brown County Planning & Land Services Dept.

b) 911 call center service areas & center locations

Progress: Completed & incorporated into our Enterprise GeoDatabase

Custodian: Brown County Planning & Land Services Dept.

c) Fire/Police Districts

Progress: Completed & incorporated into our Enterprise GeoDatabase

Custodian: Brown County Planning & Land Services Dept.

d) Fire/Police Stations

Progress: Completed & incorporated into our Enterprise GeoDatabase as part of the “Common Place” point layer (Query using “Type” field).

Custodian: Brown County Planning & Land Services Dept.

e) Hospitals and healthcare facilities

Progress: Completed and incorporated into our Enterprise GeoDatabase as part of the “Common Place” point layer (query using “Type” field).

Custodian: Brown County Planning & Land Services Dept.

f) Government Facilities

Progress: Completed and incorporated into our Enterprise GeoDatabase as part of the “Common Place” point layer (query using “Type” field).

Custodian: Brown County Planning & Land Services Dept.

g) Utilities (gas, electric, sanitary, water, phone, etc)

Progress: Brown County does not keep many utility lines in our County system, though many of the local municipalities & utility companies have completed most of their lines in GIS.

Custodian: local municipalities & utilities.

h) Parks & Recreational Trails

Progress: Completed

Custodian: Brown County Planning & Land Services Dept.

i) Transit Systems

Progress: Completed

Custodian: Brown County Planning & Land Services Dept.

j) Bridges, Culverts & Road signs

Progress: Partially complete. Most bridges are mapped in our system, as are some culverts. Few road signs are mapped but this is a planned initiative for the next 5 years, at least for the County Highway system. Also, Some of the local municipalities are mapping road signs using GIS.

Custodian: Brown County Highway, Municipalities.

k) Airports & airfields

Progress: Completed

l) Harbors

Progress: Completed

The **Port** of Green Bay is an active International Port which includes the Bay of Green Bay and the Fox River. This is a County-managed department. GIS and GPS have been used to map the following into our GIS Geodatabase:

- (1) The NOAA nautical chart #14918 covering the “Head of Green Bay and the Fox River” (1988) has been scanned and digitally referenced to the County Coordinate system and functions as a GIS layer. This chart should be updated as new ones are developed.
- (2) bathymetric (water depth) TIN and GRID data
- (3) Navigation Channel
- (4) Port facilities & acreage
- (5) dock walls with lineal footage
- (6) planned Port expansion areas
- (7) dredge zones and dredge material disposal areas

m) Boat Landings

Progress: Completed

Custodian: Brown County Planning & Land Services Dept.

n) Hazardous Material Sites; Leaking Underground Storage Tanks, etc

Progress: Incomplete.

Custodian: Brown County Planning & Land Services Dept.

o) Landfills

Progress: Incomplete

Custodian: Brown County Planning & Land Services Dept.

13. Database Design

a) Design Evaluation

The LIO Committee (soon to be Land Information Council) consisting of department heads from land-related offices and others meets regularly to evaluate, design applications, and discuss strategies for enhancements or revisions. As needed, subcommittees/task forces are invoked for larger or more technical projects. Interdepartmental benefits are a primary concern to maximize data sharing and consistency and to reduce or eliminate duplication of effort/data.

b) Project Approach

The approach varies with each type of project. Typically a conceptual model is developed, a prototype built, a pilot project engaged and revisions are made as a result of various testing.

c) Timeline

Timeline is determined on a project-by-project basis depending on needs & complexity.

d) Metadata

The County plans to continue maintaining metadata, preferably as embedded XML within enterprise geodatabase to allow the software to help with central maintenance, updates, and distribution of the metadata simultaneously with the data themselves.

e) Security/Privacy

SQL Server, Windows, and other computer security is used. Privacy is evaluated as needed. One privacy policy we have in place is to prevent users from searching for land owner names on our free internet sites.

f) Implementation and Maintenance Strategy

The County carefully evaluates large projects before implementation. The implementation & maintenance strategy varies with projects or layers, but generally a 'data custodian' is identified and is directly involved with the implementation & maintenance strategies.

g) Data quality management

The "custodian" of the data is also directly involved with data quality management. Brown County has used various techniques, including the old National Map Accuracy Standards as well as the newer NSSDA guidelines to test and report data quality.

h) Needs Assessments

Large projects should always involve a detailed needs assessment and workflow analysis.

i) Data structure and format (eg. Topology)

The format used for various datasets depends on the needs, resources, data 'custodian' staff training, and presence of legacy systems; however, it is a goal to continue updating data structure & format to take advantage of new technology such as

Topology rules and relationship classes offered in the enterprise GeoDatabase model.

j) GIS database models

The GIS data model is usually developed in-house depending on needs and workflows; we do look at on-line data models as guides. The WLIA would be well-served if all associates posted data models to learn from.

k) Data Dictionaries

The County develops data dictionaries for attributing datasets consistently and for collection with GPS receivers and other handheld data collectors.

l) Coding Schema

When possible, "Subtypes" ("pick-lists") are developed in the GeoDatabase to ensure standardized coding schemes and speed up data entry.

m) Transaction Management

Brown County utilizes a Transactional Versioning system available within the SDE GeoDatabase. In the near future, we will be implementing Historical Versioning on our Enterprise Geodatabase so that "snapshots" of every dataset is available to users. Archives of data are also kept on tape and in other media. Time-stamped, file-based archives of continuously-changing data such as parcels, streets, and land use should be kept on the FTP site to facilitate better access to archival data.

n) Organizational information flows

Flow charts are often built with Visio and the ArcGIS "Model Builder" are used to graphically depict information workflow and translate this into functional requirements, processing, etc. Project-specific plans for large projects such as the parcel / land records maintenance plan will include flow charts in detail.

o) Data conversion

Data must continually be converted to achieve the broad goals of our program. Our datasets are consistently referenced and built to ensure bi-directional conversion between GIS and CAD systems as well as other formats such as Adobe PDF. Tabular data is also housed in easy-to-translate formats.

p) Ability to integrate with other databases and information systems (vertical & horizontal)

Key fields such as parcel number are used whenever possible to integrate databases. As GIS continues to evolve we are finding that there are new and improved ways to link data.

F. Public Access

Brown County has made significant progress in providing information to the Public and has met the minimum requirements of this objective, including the Year 2001 WLIP “Strategic Initiative”.

a) Use of technology to facilitate efficient access:

(1) For many years, Brown County has been able to copy land records to Compact Disc or other media for distribution

(2) In 1997, all Brown County departments were provided with Internet access and the ability to send a limited amount of land records to users via email attachments.

(3) In 2000, Brown County Register of Deeds implemented an on-line system that enabled access to real estate records (fee required)

(4) In 2001, the Register of Deeds document images were made available on-line (also for a fee).

(5) In 2002, the Land Information Office web site went on-line.

(6) Also in 2002, the LIO facilitated a File Transfer Protocol (FTP) site to enable the transfer of large files between County offices and the public. The FTP site includes a “repository” of standard datasets that are updated weekly (if appropriate). The site is password-protected and users need the appropriate software to utilize the files.

(7) In 2002, the City of Green Bay and the Village of Ashwaubenon, City of DePere and others were added the County’s “Frame Relay Network” to enable direct network connections to specified County computer servers.

(8) In December 2002, the LIO & Information Services department developed a web page that enables users to search tax records on-line and view assessment and tax information on a record-by-record basis (free)

(9) In 2003, Register of Deeds office began receiving documents electronically.

(10) In 2003 the County I.S. department installed VPN (Virtual Private Network) capabilities for Administrative purposes. Over the next few years, Brown County should enhance & configure the VPN specifically for Land Records / GIS.

(11) In 2004, Brown County added AutoCAD “DWF” maps to the web site to enable free viewing of the parcel boundaries & text

(12) On-line tax payments became possible in 2004

(13) Also in 2004, the LIO enabled our ArcIMS (Internet Map Server) to facilitate expanded mapping with more layers and database linkages to the map. The IMS site is tied to the central SDE GeoDatabase

(14) In 2004, ArcGIS users gained HTTP access to the central SDE GeoDatabase via live “Map Services” with which they can add data directly from the County’s server to their ArcMap projects and combine with their own layers. This server includes “image services” as well as some “feature services” that allow for custom symbolization, export/extract and other advanced GIS layer functions.

(15) In 2005, Brown County was designated as the pilot to work with the Department of Revenue to develop and implement Electronic Real Estate Transfer Return system.

(16) Between 2005-2010, the use of the Internet to make land records available online has really proliferated in Brown County.

(17) In 2010, Brown County switched from ArcIMS to ArcGIS Server (Flex-based) for internet mapping.

b) Use of 3rd party technology for access

Brown County Register of Deeds utilizes Fidlar systems for access to real estate records, tract index, plats, CSMs, and other information. We also share our data with Google, NavTech, and many other mapping systems.

c) Data Sharing policies

Brown County has been changing data sharing policies to make information more accessible to the public. Few, if any, land records are copyrighted or licensed, especially in recent years. Fees have been lowered and/or even eliminated due to the increased “Public Access” fee revenues that came with 2009 Wisconsin Act 314 and the changes to statute.

d) Open Access to Data in existing format

Brown County puts most of its land information datasets online via the ArcGIS Server internet maps, and also copies of most datasets are available as free file download.s

e) Subscription-based or public-facing web services

The ArcGIS Server Internet Mapping services are public-facing and provide not only a web browser-based viewing but also the Mapping “services” are public facing so that external users with ArcMap can consume our GIS through the Web. ArcGIS for AutoCAD is also an option.

f) Customized Data

For certain projects, Brown County has produced customized data on a cost-recovery basis. We normally do this only if there is a mutual benefit, for example, developing GIS map layers that benefit both the customer and are useful to the Enterprise GIS.

g) Accessibility

Brown County’s web site is ADA compliant.

h) System Security

The GIS server and AS/400 have built-in security that is managed by the I.S. department System Administrator in the I.S. department. The ArcGIS Server Internet Map Server is an “Application Server” that is configured within the firewall to be securely tied in to our central SDE GeoDatabase. Our Web server and FTP server are configured in a similar manner, making use of a “DMZ”. ESRI’s “System Design Strategies” white paper was used to guide configuration of the GIS.

i) Privacy Policies

Brown County has an informal policy to restrict “search by name” queries on all free Internet sites. People can search by address or parcel number to get a report with the owner names on, but simply cannot enter owner name in the query. “Search by name” is available on the Register of Deeds “Pay” Internet site and on internal systems including Public Access terminals. We feel that it is reasonable and within Open Records requirements to make people identify themselves in order to search by name, and we put a lot of people such as law enforcement officers who value their privacy at ease by doing so. Nobody has provided a valid reason that “search by name” is required or needed, as most legitimate business can be conducted with “search by address” or parcel number, at least

when offered as a discreet, free of charge service. We believe that this policy meets the individual right to privacy standard.

j) Use of \$1 (now \$2) fee designated for land information and housing data as required in § 59.72 (5)(b)3

As mentioned in Section 5c above, ever since this fee was enacted in September 2001, Brown County has been using this fee as a revenue source in order to facilitate free and improved distribution of data via the Internet. This money is accounted for in a separate, interest-bearing account that accrues & carries over from year to year. Through 2009 Wisconsin Act 314, this fee was increased from \$1 to \$2 which will enable Brown County to provide more information to the public via web, FTP, and other mediums. We also intend to use this money over the next 5 years to integrate more “housing” information from all of the various municipal and contracted Assessors within Brown County.

G. Integration and Cooperation

a) We do have a **formal data sharing** Memorandum of Understanding between Brown County and the DNR (Wisconsin Department of Natural Resources). Brown County has also arranged a formal agreement with FEMA (Federal Emergency Management Agency) as it relates to floodplain mapping. In recent years, we have become less formal with our data sharing agreements; we will provide most datasets to anyone who requests it, free of charge and without license agreements.

b) Informal data maintenance agreements exist all over the County, between departments, other local units of government, and the Oneida Tribe.

c) Cooperative Agreements have been made between many other agencies (DNR, FEMA, DATCP, NRCS, FSA, and others) but mostly in an informal or project-by-project basis. These agreements expand to libraries, schools & universities, RPCs, utilities and others. Our datasharing policy in the above section touches on these agreements.

d) Consortia: One example was in 2000 when the County teamed up with many other units of government to obtain the aerial photo, contour mapping and planimetric mapping. Another example is in 2005 where Brown County is

participating in a similar consortium to save costs & reduce duplication. Brown County should continue to build these relationships, particularly with the Oneida Tribe.

e) Collaborative arrangements: Brown County continues to build collaborative arrangements with municipalities and others. The 2010 aerial flyover was one arrangement where the County paid for the photo and Orthophoto data, and the municipalities collaborated to complete value-added products (higher resolution photos, building footprints, etc). All data is shared.

f) Statutory relationships among counties and state agencies. Brown County cooperates with state agencies in any way possible, whether required by statute or not.

1. Integrative / cooperative relationships

Brown County has actively encouraged integration and cooperation activities related to land records modernization as cited elsewhere in this plan, particularly with municipalities and local utilities. For example, we provide direct network connections to our GIS server to several municipalities. Over the next 5 years, the County would like to develop an integrative/cooperative relationship with the various Assessors working within Brown County.

2. Potential partners & mutual projects

We are always open to discussing with potential partners for development, update, or maintenance of land records data set. We have or are in the process of, partnering relationships for digital Orthophoto production, contour mapping, parcel mapping, and other projects. Partners have been or may include NRCS, DNR, various municipalities, various utilities including Green Bay Metropolitan Sewerage District, DOT, UW-Green Bay, Bay Lake RPC and others.

3. Data Shared/Used

The digital County base map is being shared and used for common registration of data sets. The horizontal control network, PLSS coordinates and our GPS receivers are available for partners in data acquisition.

4. Coordination of Funding

The County has made a concerted effort to share the land records fees with all County land-related offices to implement land records modernization and will continue to do so. Additionally, the County

has applied for the WLIP grants on behalf of many municipalities within the County including Green Bay, DePere, Ashwaubenon, Bellevue, Howard, Ledgeview, Morrison, and Wrightstown. This grant funding, which previously existed when the County received the \$2 portion of the fee, was a great resource to the local governments, providing a combined \$100,000 in seed money to produce various land records datasets at the local level such as utility mapping. The County hopes to re-enact a smaller grant fund to assist with municipal training & education using this program again someday, if possible.

5. Participation of Municipalities, Tribal governments, Towns, and other agencies

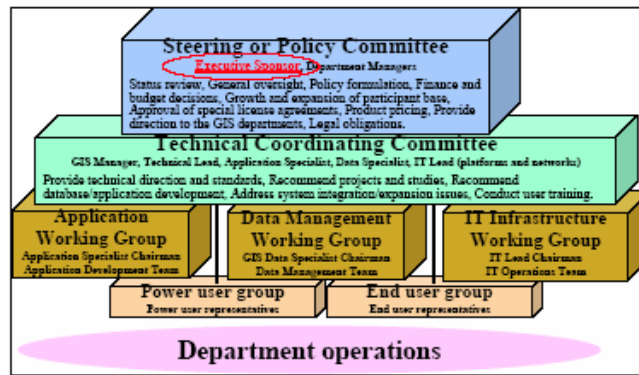
See item 4) above, pertaining to shared grant dollars and other shared resources. The County has developed positive working relationships with our Towns and Municipalities. We have opened up direct Network access to several municipalities so that they can hook right into our 'live' datasets. We plan to continue providing access to all data and maps as well as "live" access to our network if they can meet certain criteria such as security and bandwidth. The County LIO has been recently emphasizing better communication and coordination with the Oneida Tribe as well.

H. Communication, Education, Training, and Facilitated Technical Assistance

a) Documentation of County data: Brown County has created metadata and have contributed metadata to various clearinghouses as well as our own web site. However, more work needs to be done. We need to continue maintaining and adding more of the "embedded" XML metadata inside of each enterprise geodatabase feature class & dataset not only to include the documentation within the dataset, but also to ensure that it exports when 'clipping' or extracting data to send to others.

b) Resources Available: The Brown County LIO Committee (as of 2010, to be known as the Land Information Council or LIC) meets regularly; there are several subcommittees groups formed (Technical, Public Access, Emergency Management GIS Committee, and other ad hoc task forces). Minutes are kept and posted on the County web site. The LIO/GIS Coordinator

also provides these resources as needed; it is part of the job description.



Source: ESRI "System Design Strategies" white paper, 2004

c) Identification of Customer Needs: The County LIO solicits input from users and potential users by regularly presenting to and meeting with various groups. Input has also been collected and documented as discussed in a previous section of this Plan. LIO Committee and subcommittee meetings are always open to the public, and our web site contains solicitations for input as well, with email links.

d) Coordination of education/training with agencies, associations and educational institutions. The LIO and various partners have enabled this on many levels. Several training sessions have been facilitated in the County's training facility, including ArcGIS by an ESRI instructor, in conjunction with municipal & other employees. Many of these in the Brown County "LIO group" also work jointly on presenting materials at the WLIA conferences.

e) Use of technology to facilitate education and training: The GIS/LIO Coordinator began using a program called Camtasia Recorder to create audio/visual screen capture .avi videos which instruct users on the user of ArcGIS.

f) Use of Clearinghouse and Technical Assistance List Server: Several County staff, municipal staff, and others in the County participate in the Technical Assistance List Server and the WLIP data clearinghouse.

g) Use of LIO education & training funds: The LIO education and training funds are used to attend WLIA conferences or workshops.

I. Administrative Standards Not Associated with Foundational Elements

This plan represents an agreement between Brown County and the Wisconsin Department of Administration (DOA). This agreement is intended to effectuate the objectives of the Program as embodied in the enabling legislation.

The Wisconsin DOA and Brown County agree and consent as follows:

- 1.** Brown County agrees to observe and follow the statutes relating to the Wisconsin Land Information Program and other relevant statutes.
- 2.** Brown County agrees to permit the Wisconsin Land Information Board access to WLIP funded books, records and projects for inspection and audit upon reasonable notice by the Board. Other land information records, etc. will be available in compliance with the Wisconsin Open Records Law.
- 3.** Brown County agrees to complete the annual GIS Inventory Survey.
- 4.** Brown County agrees to update this plan every 5 years and in the interim if the plan should change.
- 5.** Brown County agrees to submit this plan to a peer review process and solicit comments from the local governments.

Appendix A

PROGRAM BACKGROUND*

At this point of the Plan, we felt it is important to include a short history and background of this program for the same reason people study history in general: As the saying goes, “You have to know where you came from in order to know where you are going”.

Brown County’s land records system is not new. When Wisconsin’s governmental units were organized in the early-mid 1800’s, Wisconsin and Brown County’s surveying, real estate, and recordkeeping systems were among the best in the world, given the technology of the time.



1855 Green Bay Land Agent Building

However, over the next 150+ years, the paper-based land records system grew unwieldy, outdated, and inefficient to use.

By the 1970’s, 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 technical and institutional impediments that limited the access and use of various public records. In this report, the inefficiencies of the existing system were translated into higher costs to taxpayers. Pressures to modernize also came from the private sector, such real estate, assessment, engineering, surveying, and other businesses that rely on land records for day-to-day business transactions.

In 1985, Governor Anthony Earl created the Wisconsin Land Records Committee (WLRC) by Executive Order #79. The conceptual model for a land records modernization program was developed by the WLRC and synthesized in their final report to the governor in 1987. The report recommended implementation of a Wisconsin Land Information Program for modernizing the land records at all levels of government.

A. Wisconsin Land Information Program Background

In 1989, the Wisconsin Legislature and the Governor created with assistance from the land information community began a collective journey to transform land information from a 150-year old, non-integrated, paper-based institution into a digital world reflective of, and in step with, the Information Age. Wisconsin Act 31 established the Wisconsin Land Information Board (WLIB) and created the Wisconsin Land Information Program (WLIP). Under this program, all 72 counties established a local Land Information Office as defined in State Statutes 59.72 and 59.43. One of the WLIB's charges was to fund the WLIP entirely through increased user fees of \$4.00 per real estate documents recorded on or after July 1, 1990, in the County Register of Deeds office. The fee is currently \$11 for the first page of a document, where \$4 of this is retained by the County as "retained fees" for general program initiatives & maintenance; \$1 is retained by the County to ensure Public Access of data, \$2 is returned to the State to fund grants and comprehensive planning; and the remaining \$4 is held by the County for general purpose revenues. The fee was originally created with a sunset to provide start up dollars for land information with the idea that it would cause the program to be reviewed at a later date to ensure that it was accomplishing it's goals. Former Senators Welch (R) and Wineke (D) created the fee & the Land Info Program circa 1990. The sunset has been extended by both McCallum and Doyle in the past.

The year 2005 is witnessing a lot of changes in the WLIP. The sunset for the \$2 and \$1 fee may be removed and all other fees will remain in place to ensure adequate program funding; however, the governor has decided to reduce the number of appointed Boards across the state and has decided to eliminate the WLIB. All responsibilities of the WLIB are being transferred to the State Department of Administration, Land Information Officers Network (LION), the Wisconsin Land Information Association Board and a proposed state Geographic Information Officer (GIO).

B. Brown County Land Information Office history

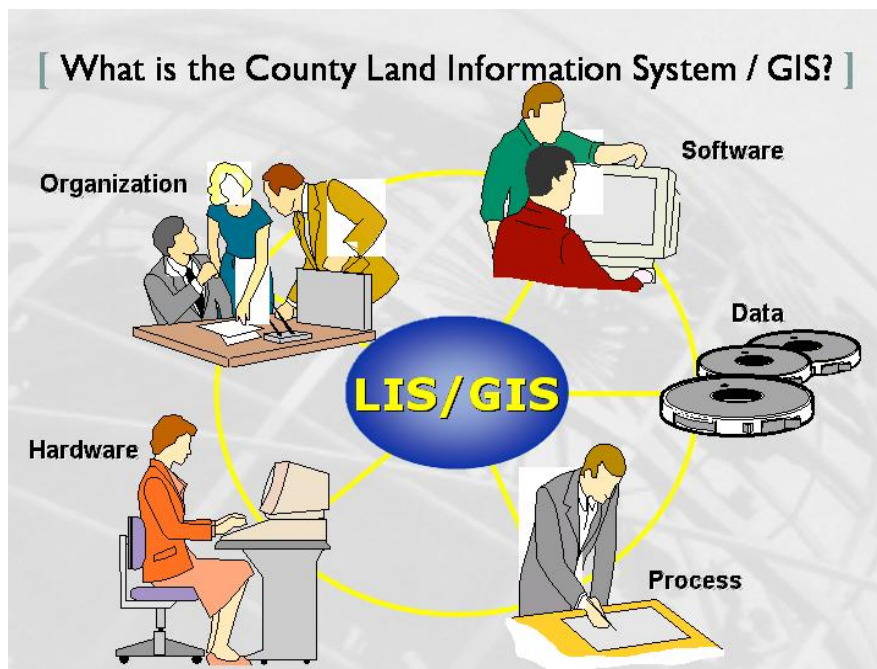
The Brown County Board established a County Land Information Office (LIO) in 1990. The objective included the facilitation of the development of a fully integrated land information system. In 1990, the recording fee increased to \$8 (\$4 increase) with \$2 to the WLIB and \$2 to the LIO. Additionally, the establishment of a County LIO became eligible under the WLIP to apply for grants on behalf of itself or on behalf of municipalities within the county. The County Board resolution also included the formation of an Advisory Committee comprised of the following county departments:

| LIO Committee Department Representation, 1990 | |
|---|---|
| <ul style="list-style-type: none"> • Data Processing • Highway • Planning • Sheriff • Solid Waste • Treasurer • Planning and Development Committee | <ul style="list-style-type: none"> • Finance • Land Conservation • Register of Deeds • Surveyor • University Extension • Zoning |

It reports to the Planning, Development, and Transportation Committee of the County Board.

The Brown County LIO Committee has undergone structure changes as well; the UW-Extension representative has been replaced by the Property Lister position. Additions to the committee since its inception include two County Executive appointments and the director of Public Safety & Communications Department. The current membership is listed in the Executive Summary of this Plan.

In 1997, Brown County saw fit to create a full time GIS/Land Information Office Coordinator position to spearhead communications and modernization projects, administer LIO budgets and grants, and coordinate Geographic Information Systems integration between departments and partnering organizations. This position is paid in full by the retained fees. Originally the LIO Coordinator was located within the Planning Department, but moved to the Information Services department in 1999.



Appendix B

PROGRAM ACCOMPLISHMENT SUMMARY*

The success of the Land Records Modernization (LRM) Program is significant and measurable. Improved technology provided through the program has saved taxpayer dollars by reduced staffing, and also benefited the public tremendous amount of information is being offered on the Internet so customers can help themselves.

The benefits of the program are not limited to internal efficiencies within County government; the private sector and the general public have benefited as well. Many types of private business-- such as real estate, engineering, architecture, and utility companies—rely upon and routinely utilize the County's modernized base maps, document images, GIS databases and other modernized land records.

The 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 office or home. The program has increased accessibility to public information not only in terms of reducing trips to government offices, but also by allowing users to run database queries a centralized, integrated, up-to-date computer database, thus shortening the time spent searching the data. County records that are available on the Internet are accessible at any time to the public, not just working hours Monday through Friday.

Technically, Brown County is at or near the "cutting-edge." The WLIP has held modernization to mean collection, improvement and electronic maintenance of land information. The use of new technologies has greatly improved the accuracy and completeness of many records. Brown County now routinely uses modern technology in the form of global positioning system (GPS) receivers for land surveying and digital orthophoto images for base mapping. Geographic Information System (GIS) software has the unique ability to collect, store, connect, and integrate all sorts of geographically-referenced information. We can now link land ownership, address, tax, and assessment records with zoning, soils and wetlands mapping into a single system.

As the program has grown and expanded, the use of information generated as a result has increased greatly. Today current, modernized geographic information is being used in applications ranging from emergency management and E-911 support to land conservation, comprehensive land use planning, and transportation analysis.

Brown County has dedicated staff that shows a lot of individual commitment to the group effort. Our achievements are the result of the combined effort of each individual.

A. Existing/Previous LRM Plans

The following Brown County LRM assessments or plans have preceded this Plan:

- 1991 GIS needs assessment & LRM Plan
- 1993 LRM survey
- 1994 Document Imaging Plan
- 1995 Land Records System (LRS) plan
- 1996 LRM Plan Amendment
- 2000 LRM Priorities Survey
- 2000 GIS/LRS Access Plan
- 2000 LRM 5 Year Plan (*This plan superseded all previous plans*)
- 2002 Functional Requirements for Access to the GIS server
- 2002 ArcSDE need analysis & migration plan
- 2005-2010 Land Records Modernization / Land Information Strategic Plan

A few partnering organizations within Brown County have conducted their own assessments or plans that relate to GIS. For example, the Village of Bellevue completed a GIS/RDBMS Five-Year Strategic Plan covering a period of 2010-2014.

The previous County & Municipal plans share many common threads; there are recurring projects or GIS needs that were identified in each. The 1995-96 LRM Plan identified several broad categories that allowed the grouping of each activity. In addition, the Wisconsin Land Information Board has established certain Foundational Elements as targets for modernization activities that must be addressed. The major themes were also gleaned from the priority surveys conducted in 1993 and 2000. The list below summarizes the “major categories” of the Brown County LRM program.

Six Goals of the LRM Program were compiled & summarized from all previous plans below:

1. To develop the 15 “Foundational Elements”¹
2. To implement a Document Management System

¹ The WLIP identified 15 “Foundational Elements” as targets for a basic Land Records Modernization Program. These elements serve as a base for all modernization activities and user applications.
Brown County Land Records Modernization 5-Year Strategic Plan: 2010 - 2015

3. To employ Overlay Analysis Capabilities for better combinations of information & visualization
4. To support Planning
5. To provide quick and easy access to data (ad hoc and special queries, maps, reports, etc)
6. To aid in Design & Construction of roads, utilities, buildings, and other facilities

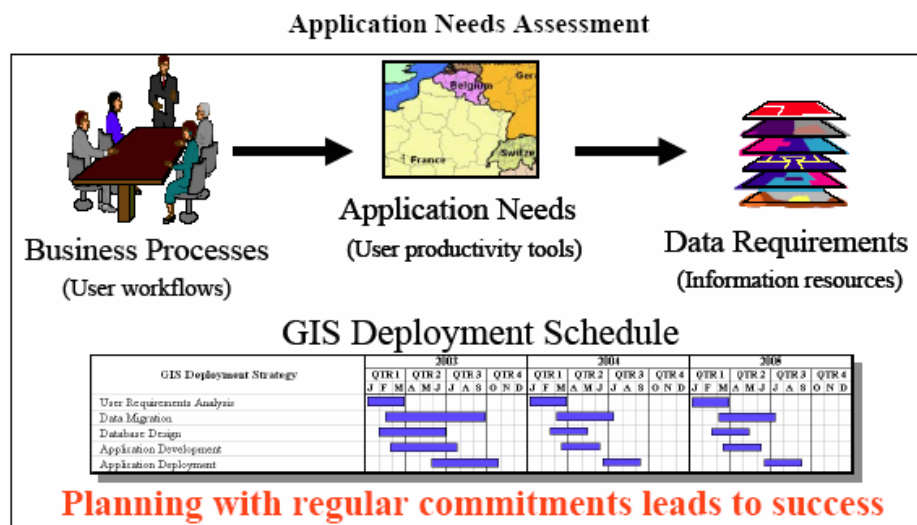
Appendix C: NEEDS ASSESSMENTS

Through the years, various needs assessments have taken place to help determine the internal and external customers needs and priorities for land information and technology. In 2010, as part of the preparation for this Plan, each department represented in the executive summary above was interviewed by the GIS/LIO Coordinator.

System architecture design provides a methodology for establishing hardware and network requirements that support the performance and communication needs of GIS application users. Hardware requirements should be established based on identified business needs. A fundamental understanding of user workflow requirements and the supporting GIS technology is required before one can identify the appropriate hardware and network requirements for supporting effective enterprise GIS operations.²

Several Needs Assessments were completed and documented in previous Plans (listed in Section III). Many of the same workflows that existed 10 or more years ago when these plans were created are still in place today. However, other aspects of the GIS technology have changed considerably, especially computer hardware.

Therefore, new needs assessment should be completed and documented for each major activity and new initiative identified in the next section of this Plan. The process can be summarized with the following graphic:



² System Design Strategies: A White Paper by ESRI, Inc.
Brown County Land Records Modernization 5-Year Strategic Plan: 2010 - 2015

The user needs assessment should be documented and shared with all users. The result of the application needs assessment should identify user workflow requirements, list existing and required data resources, and provide a prioritized list of GIS applications required to support operational needs. The results of the study should include a schedule for data acquisition and application deployment.

Appendix D

Cost-Benefits Assessments*

The Brown County Land Information Office has begun compiling concise Cost-Benefit analyses for specific projects. These studies are available upon request.

In general, a modernized land record system saves tax dollars and provides benefits in the following ways:

- Reduces redundancy / duplication of effort across departments and the community;
- Increases the efficiency of County staff who need to frequently look up and use land records and maps;
- Reduces the amount of storage space required to hold our vast land records stores
- Enhances reliability and completeness of databases & maps
- Makes data easy to visualize through graphics and maps;
- Provides almost limitless varieties of maps and advanced analysis, tailored to specific needs of individual projects as well as broad programs;
- Increases the share ability of data across all levels of government and the private sector to provide a high level of public service

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