Outline

Introduction

Data Maintenance
  Who maintains your data?
  How is the data maintained?
  Where is the data stored?
  How are updates processed?

Basic Location Information

Data Acquisition
  Types of Data Sources
  Parcel Data
  Related Data

Assessment Data Visualization and Analysis
  Analysis Integrated Directly with Assessment System
  Analysis Disconnected from the Assessment System

Practical Step By Step Example/Demo

Breaks will be as needed and times will be adjusted accordingly.
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City of Oshkosh

City of Oshkosh - IT Division

City of Fond du Lac - Engineering Division

Fond du Lac County - Planning Department

Juneau County - Land Information Office

North Central Wisconsin Regional Planning Commission

Wisconsin Land Information Association Board Member

Vice-chair Technical Committee - Working toward a Statewide GIS Portal/Repository
Data Maintenance
Who maintains your parcel data?

Real Property Listing/Tax Listing
County or Municipality
WRPLA - [http://www.wrpla.org](http://www.wrpla.org)
72 Counties
24 Cities

Assessment Data
Contracted Assessor or Municipality

GIS Data
County – All 72 counties are required to annually submit data to the State of Wisconsin (Act 20).
Municipality or Third Party (Consultant or Regional Planning Commission). Information on which third parties maintain GIS parcel data are not tracked statewide.
**Data Maintenance**

How is the data maintained?

**Documented Workflow**

- **Data Updated Sequence**
  
  How is data maintained between January 1 and the Board of Review?

- **Frequency**
  
  Is the data maintained and/or distributed daily/weekly/monthly/yearly?

- **Accuracy (tabular and geographic)**
  
  Many fields are maintained very accurately (i.e. owner names, location addresses, mailing addresses, etc). Evaluate the accuracy of infrequently used fields before large mapping or analysis projects (i.e. note fields, living unit data on tax exempt parcels).

  Not all GIS parcels are/can be mapped with the same level of accuracy. Area with good control (i.e. PLSS) and a recent survey (Certified Survey Map or Plat) are more likely to be mapped accurately. **GIS parcel lines ARE NEVER a replacement for a Professional Land Surveyor doing a survey.**

- **How synchronized are each of the data sources?**
  
  Frequently Tax Listing, GIS, and Assessment databases are updated on different cycles.

  It is a good practice to have a process for comparing parcel records in each system to find mismatches.

- **Compatibility of data sources**
  
  Is each of the data sources updated on the same cycle?
Data Maintenance

It is very important to understand who is maintaining the data you are using and how it is updated and maintained. Answering the following questions will help you to understand how parcel data can be best used.

Where is the data stored?

How is it made available for end users (internally and externally)?

How are updates processed?
  Are records updated in Tax Listing/Assessment/GIS at the same time?
  Are the procedures the same all year or are there differences before the Board of Review?

If the data is maintained by multiple organizations who are the critical players in maintaining and distribution of the data?
Basic Location Information
Where is the parcel I am looking for?
Hard copy or pdf map – Not common
Basic Location Information
Assessment Website Integrated with GIS
www.ci.oshkosh.wi.us/assessor/index.html (Oshkosh Public Access)
Basic Location Information

Website GIS Parcels (publicly accessible, intranet or username required)
Wisconsin Local Government Web Mapping Sites Inventory (public sites),

Example

www.ci.oshkosh.wi.us/Administrative_Services/Information_Technology/GIS/index.asp then
click City of Oshkosh Parcel Viewer
Basic Location Information

Desktop GIS Map – ArcGIS, ArcReader, QGIS, IAS Field Mobile, AutoCAD, etc
Basic Location Information

Assessment/Appraisal Base Map
- Very helpfully to have a base map focusing on Assessment/Appraisal needs.
- Do not overload the maps in order to keep the map performing well.

Workflow or Task Specific Maps
- Consider creating separate maps for specific tasks or types of work.
- This generally allows the GIS to perform better and be more stable.

Initial Base Map Layers

<table>
<thead>
<tr>
<th>Address Labels/Annotation</th>
<th>Parcels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building Footprints</td>
<td>Parks</td>
</tr>
<tr>
<td>Certified Survey Map/Subdivision</td>
<td>Public Land Survey System</td>
</tr>
<tr>
<td>Boundaries</td>
<td>Railroads</td>
</tr>
<tr>
<td>Condos</td>
<td>Road Right of Way</td>
</tr>
<tr>
<td>Easements</td>
<td>Street Labels/Annotation</td>
</tr>
<tr>
<td>Floodplain</td>
<td>Streets</td>
</tr>
<tr>
<td>Hydrography/Waterways</td>
<td>Taxation Districts (Sanitary, School, TIF, etc)</td>
</tr>
<tr>
<td>Municipal Boundaries</td>
<td>Vacated Road Right of Way</td>
</tr>
<tr>
<td>Orthophoto (at least the most recent)</td>
<td>Zoning</td>
</tr>
</tbody>
</table>
Basic Location Information

Additional Relevant Map Layers
- Annexations
- Assessed Value Percent Change
- Assessment Classification
- Assessment Neighborhood
- Building Permits
- Correction Notices
- Elevation (LiDAR, contours, etc)
- Foreclosure Density
- Foreclosures
- Historic Districts
- Historic Lot Lines
- Historic Sites
- Land Use (current and future)
- Likely Residential Owner/Renter Occupancy

Assessed Value Percent Change
- Number of Dwelling Units per Parcel
- Orthophotos
- Parcel CDU (Condition, Desirability, Utility)
- Parcel Grade
- Parcel Housing Style
- Parcel with Influence Codes
- Parcels with Recent Sales
- Primary Onsite Wastewater Treatment Systems
- Remediation and Redevelopment Sites
- Road Ratings
- Street Classification
- Street Rating
- Utility Data
- Wells
- Wetlands

Helpful GIS Base Map Tools
- Parcel Number Search Tool
- Google Street View / Bing Birdseye View Addin – www.ianbroad.com (Street View)
- Address / Intersection Geocoder
- Hyperlink to Assessment Website/Assessment System
Data Acquisition

Types of Data Sources

GIS Files

- .shp – Shapefile - common
- .gdb – File Geodatabase - very common
- .mdb – Personal Geodatabase and/or Traditional Access Database
- .xml – GIS eXtensible Markup Language (XML) Recordset
- .cov – Coverage - uncommon

Tabular Data

- .txt – Text File, the contents could be organized in a number of ways
- .csv – Comma Separated Variable File
- .xls or .xlsx – Excel files
- .tab or .tsv – Tab Separated Variable File
- .xml – eXtensible Markup Language

Web Based Services – There is a wide variety of web based geospatial services available. Some are proprietary and others are open source.

ESRI Services from ArcGIS Server, Portal or ArcGIS Online can be used with ESRI compatible applications.

Open Geospatial Consortium, Inc (OGC) services (WCS, WFS, WMS, WMTS, and WPS) are compatible for a wider variety of applications. Other proprietary services formats
Data Acquisition

Parcel Data

GIS – County, Municipality, or Third Party which maintains the parcel data. The County Land Information Office is a good point of contact.

Land Information Officers Network (LION) website - [http://www.wlion.org/LIOs](http://www.wlion.org/LIOs)

County Land Information Plans can be found on the Department of Administration website. These plans frequently describe how GIS data is maintained in each county.

[http://www.doa.state.wi.us/Divisions/Intergovernmental-Relations/Land-Information-Program/County-Land-Info-Plans](http://www.doa.state.wi.us/Divisions/Intergovernmental-Relations/Land-Information-Program/County-Land-Info-Plans)

Tax Listing – This data is frequently integrated with the GIS parcel data. Refer to the previous section how these datasets are integrated.

Assessment – Talk with the Municipal or Contracted Assessor and their IT support.

Getting GIS Data

Authoritative Data Source – Make sure the data is created by an organization that is a subject matter expert and review the quality of the data yourself.

Municipal Park Data – Created by a Municipality or County

Census Data – Created by the Federal Government

Utility Data – Created by the utility

Authoritative Data Aggregator – There are a number of Portals (a system used to find data) and Repositories (a system used to aggregate data) that have been created to help people find authoritative data.

Secondary Sources – For non-critical functions like background data not part of your core business need. Example Google Maps data which has a park map in the wrong location.
Data Acquisition

Great Places to Find Authoritative Wisconsin GIS Data

• University of Wisconsin-Madison GeoData - http://maps.sco.wisc.edu/opengeoportal/

• University of Wisconsin-Madison Historic Aerial Image Finder - http://maps.sco.wisc.edu/WHAIFinder/

• WI Applied Population Lab Get Facts, demographic data http://www.getfacts.wisc.edu/

• WI Legislative Technology Services Bureau - Election Districts, Elections Data, Municipal Boundaries http://legis.wisconsin.gov/ltsb/gis/

• WI Statewide Parcel Map Initiative Statewide Data - http://www.sco.wisc.edu/images/stories/publications/V2/data/

• Wisconsin View, Imagery and Elevation Data http://www.wisconsinview.org/


Refer to the GIS Resources handout for a full list.
Where can I find the GIS data download I am looking for? (Floodplain, Parks, Zoning)

If you are looking for a small area (a county or municipality) ask the municipal GIS staff or County GIS/LIO staff or look on their website.

If you are looking for a large area (multiple counties) look at one of the statewide resources.

Example: Looking for zoning data in Outagamie County
1) I went to Outagamie County Land Information website and clicked data download
2) Did a search for zoning
3) Clicked the zoning layer
4) Clicked

Not all jurisdictions have the capability of providing data downloads for their GIS layers.

Some counties have also started to submit zoning data as part of the Statewide Parcel Map Initiative. Download this data at WI Statewide Parcel Map Initiative Statewide Data website
Pre-Workshop Survey Questions and Topics of Interest

How can I display comparables for Open Book or Board of Review?

Board of Review comparables map can be done by simply displaying only the comparable parcels. For comparables outside of your jurisdiction you can use a geocoder to locate the approximate location of the properties for the map. Alternatively you can download the GIS parcel layer from the Statewide Parcel Map Initiative website.

If using ArcGIS create a definition query restricting the layer to only the comparable parcels.

```
SELECT * FROM GISPub.GISADMIN.TaxParcel WHERE: "PARNO" in ('90100170000', '90100860000', '91100140000')
```
How can I link to GIS as part of other (iasWorld, Market Drive, etc) software?

If you can create a procedure for getting update parcel data (Assessment, Tax Listing, and GIS) on a regular basis the datasets can be displayed in GIS (Desktop or Intranet/Internet sites).

Example

- Assessment Database Oracle
- GIS Database SQL
- GIS Processing Database SQL
- Assessment Publication DB SQL
- GIS Publication Databases SQL, FGDB
- Weekdays
- On Demand

ArcMap
ArcGIS Online
iasWorld
Evolve
Web Based Services
How can you move data from CAMA into GIS and from GIS into CAMA?

To move data between CAMA and GIS and permanently modify the primary parcel record in mass, contact your IT, GIS staff, and possibly your software vendor.

The database structures, data processing workflow, and application configuration can frequently be complex.

With that said any records which have a one to one match for parcels are much easier to update. For example, if all parcels have a single zoning classification. It is also possible to identify “many zoning classifications” for some parcels. Database Administrators/Software Vendors may be able to make mass updates like this.

It is more difficult when there are multiple records for each parcel. Especially if they are stored in more than one way. For example, getting building information from CAMA into GIS. Relying on someone who has a clear in-depth understanding of how the source data is maintained is very important.
How can I link to GIS as part of the software?

If you can directly link to a single parcel on your assessment website, you can most likely link GIS to the parcel.

Example:

```
link={PARCELIDSH}&jur=9&taxyr=(TAXYR)&LMPare
```
Assessment Data Visualization and Analysis

Analysis Integrated Directly with Assessment System (example)

Neighborhood sales map

<table>
<thead>
<tr>
<th>Parcel Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Property Address</td>
</tr>
<tr>
<td>Property Zip Code</td>
</tr>
<tr>
<td>Class</td>
</tr>
<tr>
<td>Zoning (see FAQ link above)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Owner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
</tr>
<tr>
<td>In Care Of</td>
</tr>
<tr>
<td>Address</td>
</tr>
<tr>
<td>Unit #</td>
</tr>
<tr>
<td>City</td>
</tr>
<tr>
<td>State</td>
</tr>
<tr>
<td>Zip Code</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lot Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frontage</td>
</tr>
<tr>
<td>Effective Depth</td>
</tr>
<tr>
<td>Square Feet</td>
</tr>
<tr>
<td>Acres</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Legal Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desc</td>
</tr>
</tbody>
</table>
Assessment Data Visualization and Analysis

Analysis Integrated Directly with Assessment System (example)

Neighborhood sales map
Assessment Data Visualization and Analysis

Analysis Integrated Directly with Assessment System (example)

- Selection parcels within a buffer distance
  - Select a parcel
Assessment Data Visualization and Analysis Disconnected from the Assessment System

Assessment Neighborhood

Right click the parcel layer and click properties.

Use a \textit{definition query} to display only parcels that match specific criteria.

Use \textit{symboloby} to display parcels differently based on a field in the database.
Influence Code Mapping

Definition Query:
"pcycos.CLASSC" = 'A'
This definition query displays parcels which have a calculated acreage more than 50% different from deeded acreage.

Excluding condos, condo common areas, and buildings on leased land (specific to Oshkosh).

Parcels where the calculated acreage is more than 50% larger than the deeded acreage.
Foreclosure Density
Parcels by Assessment Classification
Parcels by Housing Style
Parcels by Number of Dwelling Units
Residential Corner Lot Check
Residential Estimated Owner Occupancy

Definition Query:
"LOCADD" <> "MAILADD" AND "DW_UNITS" > 0

Definition Query:
"LOCADD" = "MAILADD" AND "DW_UNITS" > 0
Orthophoto Comparison

- [ ] Historic Districts
- [ ] Zoning
- [x] Street Centerlines
- [ ] Railroads
- [ ] 2-foot contours 2008 LIDAR
- [ ] Floodplain
- [x] Alternate Parcel Symbology
- [ ] Parcel Layers
- [ ] Likely Residential Ownership
- [x] Waterbodies
- [ ] Parks
- [ ] Municipal Boundary
- [ ] ESRI Imagery Service

- [x] 2015 Orthophotos
- [x] 2009 Orthophotos
- [ ] 2013 Summer Orthophoto NAIP 1 Meter
- [ ] 2010 Summer Orthophoto NAIP 1 Meter
- [ ] 2010 Spring Orthophoto WROC 18" pixel

- [ ] 2008 Summer Orthophoto NAIP 1 Meter
- [ ] 2006 Summer Orthophoto NAIP 3 Meter
- [ ] 2005 Orthophotos
- [ ] 2003 Orthophoto
- [ ] 2000 Orthophoto
- [ ] 1937 Orthophoto USDA

2339557.011  741433.874 Feet
Pictometry – CONNECTExplorer

Courtesy of the City of Fond du Lac
Pictometry – CONNECTExplorer

Courtesy of the City of Fond du Lac
Google Street View
Google Street View
**Pre-Workshop Survey Questions and Topics of Interest**

**How do you select multiple non-contiguous parcels?**

- **Single non-contiguous parcel** – Sometimes there are single parcels divided by a road or waterbody. Some jurisdictions map this as two separate polygons with the same parcel number while others create a multipart polygon.
- **Selection of non-contiguous parcels on the map** – In ArcMap hold down the Ctrl key while clicking on multiple parcels to select them. The parcel should be the only selectable layer to make this effective.

**How can staff get more access to GIS? How can staff use GIS as part of new software not a separate desktop software?**

Web based GIS services are an increasingly robust way of delivering GIS functionality to desktop GIS software, third party applications (desktop/server/cloud), and GIS web based applications. **Web based GIS services are not a one size fits all solution.** Currently the more targeted and narrow the desired GIS functionality is, the more viable web based GIS services will be - in my opinion.

**Desktop GIS**

**Pro:** Versatile, Powerful  
**Con:** Complex to learn, Some functions can be slow

**Web based GIS services**

**Pro:** Fast for lightweight app, Easily distributed, Easier to learn  
**Con:** Sometimes complex to develop, maintain, One off requests can be hard.
How can routing be used in GIS?

*In house GIS routing system –* Some local governments have this in place for service optimization. However, there can be a significant amount of time and money needed to make GIS routing accurate, reliable, and efficient.

*GIS routing online service –* ESRI offers Find Route in ArcMap. While connected to ArcGIS Online, this service consumes credits for each request.
Practical Step By Step Example/Demo

Using QGIS with publicly available data.

Creating a Definition Query in ArcGIS

Visualizing Assessment Data in ArcGIS
Geographic Information System Visualization and Analysis for Assessment in Wisconsin

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