HOW TO FILL YOUR DATA INTO THE LOCAL GOVERNMENT INFORMATION MODEL

Jeremy Williams | City of Clearwater
2014 ESRI User Conference / Presentation UC460
WHAT IS THE LOCAL GOVERNMENT INFORMATION MODEL?

- “LGIM” for short
- Data model (schema) used for quicker web application development
- ESRI supplied, connects to preconfigured applications also provided by ESRI that can be found in the local government gallery
- Introduced at version 10
WHY USE THE LG IM?

- Reduces application development time
- QA/QC already done for you
- Reduces deployment time
- Easily supported, one data store to deal with
WHY I THOUGHT THIS WOULD BE WORTHWHILE TO PRESENT

• Looked like the LGIM was going to be an overwhelming or daunting process to implement
  • Turned out to be very simplistic

• We thought we needed a 1for1 data representation to take advantage of the LGIM

• We thought we had to fill in EVERYTHING the LGIM had in order to use it
  • Only use what you need

• Thought we had to use the LGIM basemaps (see above)
  • You can use any basemap
OUR FIRST LG IM BASED APPLICATION

- Version 1: was a custom Microsoft COM object based on early IMS which ran in MS Word
- Version 2: Another custom application written in FLEX using ArcGIS Server 9.3 took over the label generation utilizing Crystal Reports
- ESRI’s released “Public Notification” late in version 10
- Once version 10.1 was released we moved our 9.3 custom version to the LG IM version.
DEVELOPMENT TIME

• ArcGIS Server 9.3 using Crystal Reports
  • 6 months of development, 2 staff members
  • Written in Adobe FLEX
  • Constant battle keeping it running
  • Disjointed process of creating labels

• ArcGIS Server 10.1 (First production version)
  • 2-3 days to load data, build the automation for the data updates, publish the services, and train the users

• ArcGIS Server 10.2
  • One afternoon to test for functionality, and to make sure the users were not disturbed during the upgrade. No additional user training needed.
WHERE IS YOUR DATA STORED NOW?

- SDE
- Shapefiles
- Geodatabase

- Keep your data in its original format and location
- Utilize Python Scripting to move and update your data as needed
WHERE DOES THE DATA GO?

- Geodatabase
- SDE
<table>
<thead>
<tr>
<th>Composite</th>
<th>Locator</th>
</tr>
</thead>
<tbody>
<tr>
<td>DualRange</td>
<td>Locator</td>
</tr>
<tr>
<td>PlaceName</td>
<td>Locator</td>
</tr>
<tr>
<td>SiteAddress</td>
<td>Locator</td>
</tr>
<tr>
<td>StreetName</td>
<td>Locator</td>
</tr>
<tr>
<td>AdministrativeArea</td>
<td>File Geodatabase Feature Dataset</td>
</tr>
<tr>
<td>AssessmentInformation</td>
<td>File Geodatabase Feature Dataset</td>
</tr>
<tr>
<td>CadastreReference</td>
<td>File Geodatabase Feature Dataset</td>
</tr>
<tr>
<td>CapitalPlanning</td>
<td>File Geodatabase Feature Dataset</td>
</tr>
<tr>
<td>CitizenService</td>
<td>File Geodatabase Feature Dataset</td>
</tr>
<tr>
<td>Demography</td>
<td>File Geodatabase Feature Dataset</td>
</tr>
<tr>
<td>ElectionAdministration</td>
<td>File Geodatabase Feature Dataset</td>
</tr>
<tr>
<td>ElectionResults</td>
<td>File Geodatabase Feature Dataset</td>
</tr>
<tr>
<td>Elevations</td>
<td>File Geodatabase Feature Dataset</td>
</tr>
<tr>
<td>EmergencyOperations</td>
<td>File Geodatabase Feature Dataset</td>
</tr>
<tr>
<td>ExecutiveReporting</td>
<td>File Geodatabase Feature Dataset</td>
</tr>
<tr>
<td>FacilitiesStreets</td>
<td>File Geodatabase Feature Dataset</td>
</tr>
<tr>
<td>FireCrew</td>
<td>File Geodatabase Feature Dataset</td>
</tr>
<tr>
<td>FireServiceOperations</td>
<td>File Geodatabase Feature Dataset</td>
</tr>
<tr>
<td>InfrastructureOperations</td>
<td>File Geodatabase Feature Dataset</td>
</tr>
<tr>
<td>LandUseOperations</td>
<td>File Geodatabase Feature Dataset</td>
</tr>
<tr>
<td>LandUsePlanning</td>
<td>File Geodatabase Feature Dataset</td>
</tr>
<tr>
<td>LawEnforcementOperations</td>
<td>File Geodatabase Feature Dataset</td>
</tr>
<tr>
<td>ParcelEditing</td>
<td>File Geodatabase Feature Dataset</td>
</tr>
<tr>
<td>ParcelPublishing</td>
<td>File Geodatabase Feature Dataset</td>
</tr>
<tr>
<td>PublicSafetyPlanning</td>
<td>File Geodatabase Feature Dataset</td>
</tr>
<tr>
<td>ReferenceData</td>
<td>File Geodatabase Feature Dataset</td>
</tr>
<tr>
<td>Stormwater</td>
<td>File Geodatabase Feature Dataset</td>
</tr>
<tr>
<td>Telemetry</td>
<td>File Geodatabase Feature Dataset</td>
</tr>
<tr>
<td>WaterDistribution</td>
<td>File Geodatabase Feature Dataset</td>
</tr>
<tr>
<td>AED_ATTACH</td>
<td>File Geodatabase Table</td>
</tr>
<tr>
<td>AED_ATTACHREL</td>
<td>File Geodatabase Table</td>
</tr>
<tr>
<td>AnimalComplaints</td>
<td>File Geodatabase Table</td>
</tr>
<tr>
<td>BuildingFloor_ATTACH</td>
<td>File Geodatabase Table</td>
</tr>
<tr>
<td>BuildingFloor_ATTACHREL</td>
<td>File Geodatabase Table</td>
</tr>
<tr>
<td>BuildingPhotoLoc_ATTACH</td>
<td>File Geodatabase Table</td>
</tr>
<tr>
<td>BuildingPhotoLoc_ATTACHREL</td>
<td>File Geodatabase Table</td>
</tr>
<tr>
<td>Census2000SummaryFile</td>
<td>File Geodatabase Table</td>
</tr>
<tr>
<td>CitizenContactInfo</td>
<td>File Geodatabase Table</td>
</tr>
</tbody>
</table>
WHAT APPLICATION TO START WITH?

- Download the application that most interests you
  - Depending on the work that you do, one of the applications from the Gallery may stand out to you more than another

- Sample applications will include the application code, MXD’s, cache settings, and a sample GDB already setup in the LGIM
  - The “MapsandGeodatabase” directory is usually where the MXD’s and GDB are located
  - The sample code is located in the “Application” directory
OPEN ONE OF THE MAP FILES FOR THE SAMPLE APPLICATION

• One or more MXD’s will be the basemaps for the application (ie. Basemap and Imagery), the others will be the working MXD’s that control the way the applications query the data

• The working or query MXD’s are where the LGIM pays off, and where your data starts to come into the picture

• Open one of the working/query MXD’s and follow the data paths into the provided GDB
MAKE A LAYER LIST

• This is where you start deciding what data you will need to move to the LGIM

• The working/query MXD’s give you a good idea of where to start, but they are not the final word

• You can add or remove data from the sample applications by simply adding additional data, or removing data from the MXD
EXAMPLE: MY GOVERNMENT SERVICES

- Included Layers include:
  - Railroad
  - Recycling Facility
  - Department of Public Works
  - Museum Community Center
  - Post Offices
  - Libraries
  - Police Stations
  - Fire Stations
  - Trash Pickups
  - Recycling Pickups
  - Street Cleaning
  - Yard Waste Pickup

- You could have
  - Recycle Drop Off Location
  - Natural Gas Filling Station
  - Refuse Collection Days
LGIM APPLICATION CUSTOMIZATION

• Publishing the sample application is a great way to see how the application works and behaves.

• It's also helpful to see how the data is handled inside the application.
  • To publish: follow the directions provided with the application.

• With the sample application published, you can start to manipulate the config.js file and see how the application reacts to your customizations within a “controlled” environment.
After the application is running on your ArcGIS Server you can start dissecting how the application actually works.

The sample code in the config.js file will paint a picture of how much of your data is actually needed to make the application work for you.

SAMPLE CODE TELLS THE STORY
LOOK AT THE SERVICES REFERENCED IN THE CONFIG.JS

ServiceUrl: “.../GovernmentServices/MapServer/4"

- The REST service directory tells you layer 4 in this case is the garbage route layer
- The FieldNames listed below the service directly reference the LGIM fields
- You can change these fields
PREPARE TO MOVE YOUR DATA

• Now that you’ve gone through the MXD’s and decided what layers you want to use
  • You’ll have a greater understanding of how you can make the application work for you
  • Need to start preparing your own LGIM
  • Your existing data will not share the schema with the LGIM

• You’ll have to decide how often your data need to be updated:
  • Static
  • Dynamic
X-RAY FOR ARC CATALOG

- ESRI makes a tool called X-Ray for ArcCatalog
- X-Ray can build you a NEW BLANK LGIM GDB in your datum of choice
- Download the sample LGIM GDB from the Local Government Gallery, use it to import the schema for a new blank LGIM
**STATIC DATA**

- **Static data is classified as data that isn't constantly changing**
  - Examples:
    - Survey Markers
    - Lighthouses
    - Parking garages
  - Static data can be filled into the LGIM once and left alone after the initial load
DYNAMIC DATA

- Data that changes frequently, either on a schedule or as needed.
  - Examples:
    - Trees
    - Utility data
    - Parcel data

- Needs to be connected to the main data source so that it can be routinely updated
STATIC DATA LOADING

• Since the schema will not match between your data source and the LGIM:
  • Join the LGIM feature to your data so the LGIM schema is appended to your data as empty fields

• Use Field Calculator to calculate each field of the LGIM that you’d like to utilize
  • Field Calculator can calculate values for the LGIM data that you may not have in your data, such as urls, contact info or operating hours

• Once the LGIM fields are filled out to your satisfaction:
  • Append your new LGIM’d data to the empty LGIM you created with X-Ray
  • make sure to use the “NO TEST” switch on the Append tool
**DYNAMIC DATA LOADING**

- Similar to static data, you’ll need the LGIM schema joined to your data so you have access to the fields of the LGIM.
- Utilize ModelBuilder to help map the data that you are loading to the LGIM.
- By using ModelBuilder, you can create repeatable steps that can be scheduled to run automatically.
  - This allows for a mostly hands off approach to updating your dynamic data.
- Once the LGIM fields are filled out to your satisfaction:
  - Append your new LGIM’d data to the empty LGIM you created with X-Ray.
  - Use the “NO TEST” switch on the Append tool.
    - Appending can be part of your model.
ModelBuilder allows the user to see a graphical representation of the processes being built.
Almost everything you can do in ArcMap you can do in ModelBuilder.

Search for the tools you need in ArcToolbox and drag them into your blank model workspace.

Drag data, tables, or features into the model.

Connect the data and the tools together to create processes that are repeatable.
AUTOMATING DATA LOADS

- Once the model is working, and tested, it can be exported to Python Script
- Python Scripts can be added to Windows Task Manager or a task scheduler like SQL Job manager
You can add fields to any of the LGIM layers.

For instance, you may need a "Truck Type" field added to the "piBoundary" layer.

- Solid Waste workers would be able to query what kind of truck a certain route needs.

If you add a field to the model, the field can be referenced in the config.js file.

- Whatever data you add can be queried by the applications you publish.

Include these new fields in your data loads to keep them up to date.
LAST STEPS

- Update the data sources in the MXD’s to reflect your data, and save as new files
  - You can name the MXD’s whatever you want
- Publish the NEW map services from the MXD’s you created
- Copy the new application to the internet host and configure as directed in the help files
- Configure the config.js file to point to your NEW map services
- Test and configure as necessary
THANK YOU

Jeremy Williams
Information Technology Manager
City of Clearwater
Jeremy.Williams@myClearwater.com

Chris Melone
GIS Technician
City of Clearwater
Chris.Melone@myClearwater.com