GSA GIS Standards

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1 Introduction

The intended audience of the GSA Geographic Information System (GIS) Standards is anyone preparing GIS deliverables for GSA, along with GSA staff requesting and reviewing GIS deliverables. Direct any questions to the GSA Contracting Officers (CO) or Contracting Officer's Representative (COR). The GSA GIS Standards are available at www.gsa.gov/gis.

2 General Requirements

All data must be delivered to the GIS Center of Excellence (CoE) in the following manner:

- For PBS design and construction projects, via the Electronic Project Management (ePM) tool.
- For all other projects, via e-mail or other method mutually agreed upon with the GIS CoE.

3 Requirements for P100 Deliverables

Contractors who are producing computer-aided design (CAD) or building information modeling (BIM) files according to the Facilities Standards for the Public Buildings Service (P100) must also meet the following requirements.

- Use a State Plane Coordinate System (NAD83 US Feet) that is appropriate for the location of the asset. If no State Plan exists for the location, e.g. Guam, contact the GIS CoE.

- If a deliverable includes any Shape file or File Geo Database (FGDB), it must be compatible with Esri 10.1 or newer.
- For BIM files, meet the requirements in Section 2.2.1 of GSA's BIM Guide 07 - Building Elements.

4 Requirements and Guidelines for Custom GIS Solutions

The following requirements and guidelines are provided for convenience. Anyone planning or working on a solution must work directly with the GIS CoE to confirm and evaluate current capabilities in order to ensure that the resulting solution can be incorporated into GSA's enterprise GIS platform and to minimize duplication or creation of functionalities that are achievable using the existing GIS infrastructure.

- All solutions must follow GSA IT standards, security policies, and guidelines, including the Enterprise Architecture Review Committee (EARC) review process.
- Solutions that require funding must go through the IT Governance process.
- All solutions must be compatible with Open Geospatial Consortium (OGC) or Esri Representational State Transfer (REST) services.
- GSA Legal has determined that GSA cannot agree to the Google Maps and Google Earth Terms of Service. Therefore, GIS solutions must not utilize free Google Maps or Google Earth resources and APIs.
- Developers working on any solution that will feed data back into a GSA system must coordinate with that system team during development of the GIS solution.
- Developers must not duplicate any GSA data outside of the GSA system of record.
- Symbology conventions
  - All solutions for PBS must use blue symbols for owned properties and red symbols for leased properties. Conventionally, PBS has used blue squares for owned properties, and red squares or circles for leased properties.
  - Check with the GIS CoE and the appropriate business line for other policies and guidelines.
- Contact the GIS CoE for existing feature class(es) and attribute table(s) against which to develop.

5 GIS-specific Best Practices

5.1 Include Metadata When Creating Maps

Metadata is information that describes the content of the map to make them searchable and easily identifiable. It helps users who are not familiar with the map to easily understand the purpose of the map.

The specific fields in ArcGIS Online (AGOL) to complete include Summary, Description, Tags. Common characteristics to consider include organization code, subject area, fiscal year, fiscal quarter, application name, project name, program name, GSA measures, partner organizations, location or geographical focus area. Using consistent tags helps users easily isolate maps that share common characteristics. Coordinate with others in your program office or community of practice on what tags to use for your topic.

For example, the Office of Mission Assurance creates a map for each hurricane. Useful tags may include OMA, disaster, hurricane, year, storm strength category (Saffir-Simpson Hurricane Wind Scale). For consistency, the OMA content creators should agree on whether to use the tag "OMA", "Office of Mission Assurance", or another abbreviation for their organization. A user could then search for all of the maps OMA made for category 3 storms in the year 2015.

5.2 Leverage Existing Data Sources

When creating a map, search for existing data sources before adding your own. This is important because for commonly used data, there is often an authenticated and validated data source from a trusted organization. Using the existing data source will help ensure consistency across maps and applications, and it will help eliminate redundancy. There could also be cost implications for manually added data.

For example, PBS publishes a list of GSA owned and leased buildings. If a user manually adds a list of buildings, it would duplicate the information, it may not match the PBS published list without regular maintenance, and it may be incorrect due to differing geographic projections.

To see a list of popular official GSA data, search for data published in the "GSA Official" group.

Users may also browse Esri's Living Atlas of the World, which is a curated set of authoritative data, by following these instructions.

5.3 Create a Good User Experience

Here are some guidelines for giving your map viewers a good user experience.
- Use simple symbology (icons) to give the map a clean interface. Start with the default AGOL symbology because they're web-optimized.
- Including too many points can generate an overwhelming experience for the user. It's more effective to hone in more specifically on what narrative you're trying to convey in order to avoid over-crowding the map with an excess of points. See additional information under Make Things Visible Only at the Appropriate Scale.
- For the symbology, use colors that both stand out and visually complement the colors used for your layers so that your points are clearly visible against all the layers of your map.

5.4 Choose the Best Map Format

- Use the best format for the data and the story.
- Resources
  - [Designing Great Web Maps](#) (ArcUser Summer 2012 page 50)
  - [Intelligent Web Maps Tell Stories](#) - "The first thing people notice about your Web Map should be the key understanding to whatever it is you are communicating."
  - [Authoring Content for Web Maps](#), specifically the "Presenting Content Effectively" section - "Well-prepared geographic information is the lifeblood of Web Maps."
  - Jack Dangermond's [Tips on Creating Well-Designed Intelligent Web Maps](#) (ArcWatch February 2012)

5.5 Use Standard Zoom Scale

- Use the web standard / Bing / ArcGIS Online / Google maps scale for everything we publish (16 zoom steps). This is the default scale in AGOL, not in ArcMap.
- This is important because the base maps all use the standard scale. Having the map and the base map scales in sync will avoid the appearance of increased latency and ensure that points are displayed in the correct geographical location.
- In ArcMap, go to scale settings, customize the list, delete everything, then load the scale option that's called "ArcGIS Online / Bing Maps / Google Maps". Check the box that says "display only these scales".
- If you create a map with a custom scale in ArcMap, AGOL would not maintain the custom scale.

5.6 Make Things Visible Only at the Appropriate Scale

- This is set by layer.
- This keeps the map geographically relevant and from getting too cluttered.
- For example, zip codes don't need to show up at a national level.

6 General Best Practices

- Follow general programming best practices. For example, if ArcGIS Javascript (JS) objects are referenced using asynchronous module definition (AMD) style, reference them using the names in the imports. For example, to create a new SimpleMarkerSymbol, instead of saying "new esri.symbol.SimpleMarkerSymbol" (non-AMD style), simply use "new SimpleMarkerSymbol".
- Pre-create Symbol objects (one for each color) and associate them with graphics instead of creating them per graphic to be rendered. In general, fewer objects means less memory and better performing application.