

Scenario 2: Data Interpretation and Conversion

Task: Converting and integrating data from various sources into the GIS database.

Objective: Ensure that data from different formats and sources, such as engineering/as-built drawings, are accurately interpreted and converted into GIS-compatible formats, maintaining spatial accuracy and attribute integrity.

Step-by-Step Process:

1. Receiving and Reviewing Data

- **Source of Data:** Data can come from engineering departments, utility companies, contractors, or other city departments in formats such as CAD drawings (DWG/DXF), PDFs, or paper plans.
- **Review:** Carefully review the received data to understand its format, content, and any accompanying documentation that describes the data attributes and spatial references.

2. Preparing the Data for Conversion

- **Data Format Check:** Ensure the data is in a format that can be processed (e.g., CAD files, PDFs, scanned images).
- **Metadata and Documentation:** Gather all relevant metadata and documentation that explains the attributes, coordinate system, and scale of the data.

3. Opening ArcGIS Pro and Setting Up the Project

- **ArcGIS Pro:** Open ArcGIS Pro and set up a new project for the data conversion task.
- **Coordinate System:** Set the coordinate system for the project to match the data's original coordinate system if provided, or set it to the target coordinate system used by the City of La Mesa (e.g., NAD 1983 StatePlane California VI FIPS 0406 Feet).

4. Importing CAD Data into ArcGIS Pro

- **Add Data:** Add the CAD drawing files (DWG/DXF) to ArcGIS Pro.

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Insert Tab > Add Data > Add CAD Data
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- **Check Layers:** Verify the CAD layers imported correctly and are displayed in the map view.

5. Georeferencing (if needed)

- **Georeference Tool:** Use the georeferencing tool to align the CAD drawing with existing GIS data.

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CAD Layer > Data Tab > Georeference > Add Control Points
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- **Control Points:** Select control points in the CAD drawing and match them to known locations in the GIS dataset.
- **Save Transformation:** Once the CAD drawing is aligned, save the transformation.

6. Digitizing Features from CAD Data

- **Create Feature Class:** Create a new feature class in the geodatabase to store the converted data.

Catalog Pane > Databases > Right-click on the Geodatabase > New > Feature Class

- **Digitize:** Use the editing tools in ArcGIS Pro to digitize features from the CAD drawing into the new feature class.

Edit Tab > Create Features > Select Template > Draw the Feature

7. Attribute Mapping and Editing

- **Attribute Fields:** Ensure the attribute fields in the new feature class match those in the CAD drawing.

Fields View > Add Fields > Configure Field Properties

- **Attribute Editor:** Use the attribute editor to manually enter or map attributes from the CAD drawing to the GIS feature class.

Edit Tab > Attributes > Update Fields

8. Quality Assurance and Validation

- **Validation:** Run validation checks to ensure that the newly digitized data adheres to spatial and attribute integrity rules.

Data Tab > Data Design > Attribute Rules > Validate

- **Topology Check:** Perform a topology check to ensure there are no spatial errors such as overlapping polygons or disconnected lines.

Edit Tab > Validate Topology > Errors Pane

- **Review Changes:** Review all the changes to ensure they are accurate and complete.

9. Converting Other Data Formats

- **PDF or Scanned Images:** For data in PDF or scanned image formats, use the georeferencing tool to align the images with existing GIS data.

Insert Tab > Add Data > Add Raster Data > Georeference

- **Digitize from Images:** Manually digitize features from the images into the GIS database using the same process as for CAD data.

10. Integrating Data into the Enterprise Geodatabase

- **Import Features:** Import the newly digitized feature classes into the enterprise geodatabase.

Analysis Tab > Tools > Data Management > Import > Import Features

- **Update Database:** Ensure that the new data is correctly integrated into the existing geodatabase structure, maintaining versioning and editing rules.

11. Updating Metadata

- **Metadata Creation:** Create or update metadata for the new feature classes to document their source, accuracy, date of creation, and any transformations applied.

Metadata Tab > Edit Metadata > Save

12. Documenting the Conversion Process

- **Process Documentation:** Document the entire conversion process, including steps taken, any issues encountered, and how they were resolved. This documentation should be stored in a shared repository or GIS management system.

Document updates in a shared repository or GIS management system.

13. Communicating with Stakeholders

- **Notify:** Inform relevant stakeholders (e.g., GIS Manager, engineering departments) about the new data that has been integrated into the GIS database.
- **Report:** Provide a brief report summarizing the data conversion process, including any significant changes and their implications.

By following these steps, you ensure that data from various sources is accurately interpreted, converted, and integrated into the GIS database, supporting the City of La Mesa's various departments in their decision-making processes and daily operations.