

# Surviving the Storm -- Migrating from ArcInfo GIS to ArcSDE

## **Author:**

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## **Abstract:**

Many GIS departments are still riding out the storm in ArcInfo coverages, such as Librarian or ArcStorm, for their database management. Most are not aware of the detailed steps required to migrate into ArcSDE. At HCAD, we have spent the last year planning and implementing a migration to the Geodatabase. Let our time spent in the rain shed some light on other Geodatabase hopefuls, especially those in cadastral data management. This paper will introduce the basics, along with detailing the nuts and bolts (including software used, tips and lessons learned) in migrating cadastral data and the annotation to a successful ArcSDE Geodatabase coming from either ArcStorm or ArcInfo Coverages. I will outline suggested steps to take, highlighting along the way the things I've learned outside the ESRI training classroom.

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## **Overview**

- Covers Database conversion only using ArcSDE 8.3 and ArcGIS 8.3.
- Preparation & Decision making
- Designing & Building Geodatabase
- Loading Feature Classes (FC) (non-anno)
- Preparing & Loading FC Annotation
- Adding other Geodatabase Functionality
- Reloading FC Data and FC Annotation
- Reloading "Guidelines"
- Other Geodatabase quirks
- Maintenance & Summary

## **Where to Begin...Prepare**

- Train, learn, study Geodatabase terms, ArcSDE, and ArcGIS desktop tools.
- Have ESRI support web site and ArcGIS Desktop help at hand daily.
- If no DBA, train, learn, study RDBMS. (Oracle, SQL-Server, Informix, etc.)
- Think in database terms, forget what you know about coverage environment. (ArcStorm or librarian.)
- Sit with GIS operators and watch editing.
- Understand and document the workflow and current GIS structure.

## Make Decisions -- Prepare

- Decide what layers are most important to keep. (points, arcs, regions, anno, etc.)
- Decide what ArcGIS and ArcSDE functionality you want to use. (I.E. Versioning, topology, feature linked annotations, COGO, dimensions.)
- Salvage from current set up in ArcStorm or librarian. (Make each layer its own feature class, arcs into lines, regions into polygons, anno into Anno FC)
- Decide use of Modeling Tool to design the Geodatabase structure. (MS Visio works with ESRI add-ins.)
- Use Pilot area for testing and plotting.

## Design Geodatabase

- Set up ArcSDE & RDBMS Software.
- Design Topology on paper. (Feature Classes that participate in topology have to be in same Feature Dataset.)
- Decide where subtypes, domains or relationships can be implemented.
- Set up Spatial Reference – Coord System, Precision & X/Y Domain. Trick – You can import your largest feature into feature class and use the default precision & XY domain ArcCatalog creates.
- Set up DBTUNE File.
- Design Annotation FC on paper. Linked anno great for anno intensive needs.
- Design Versioning on paper. 1 version per editor, 1 QC version, DE.Default only, etc.

## Build Geodatabase

- Use Modeling tool (Visio) or ArcCatalog.
- Add Feature Data Sets.
- Add Feature Classes, sub types, domains & relationships.
- If Visio -- Check model, export to XML, then import Geodatabase using ArcCatalog's "CASE Schema Creation" tool.
- Set up Spatial Reference – Coord System, Precision & X/Y Domain. (you can set when using CASE schema tool.)
- Do not register as versioned yet.

## Load Data (Vector non-anno)

- Export arcs, points, polygons, regions, into coverages using ArcPlot or ArcEdit.
- Command Line "cov2sde -o init...", batch file, save to output file; cannot load subtypes, error prone (SDE -148 & -155) cannot use -a <entiy mask> on init (loading) option.
- ArcCatalog "Load Data..." from coverage, Easy to use, can load into subtypes; No batch file, cannot save output, error prone (SDE -148 & -155)
- ArcCatalog "Import...Coverage to Geo", NO errors, can save batch; cannot save output, has to create brand NEW feature class (defeats purpose of using Visio and Extraction tool)
- Cannot load subtypes using cmd line. Workaround:

- Can load the biggest subtype using command line.
- In database update the business table's sub type field.
- Load other subtypes with Arc Catalog.
- SDE errors in cmd line or AC “Load Data” Workaround: Fix them or Use ArcCatalog Import and recreate the Feature Class.
- Organize scripts and output coverages for reloading. Can use mixture of methods.

## Prepare Annotation

- Preparing Annotation is the key!
- Export annotation into coverage.
- \$FIT=OFF \$Size = 0 must be set to change sizes in ArcMap.
- In ArcMap set up the Anno coverages ONCE, save MXD.
  - Choose reference scale & map units in which to create anno.
  - Set font, size, symbol properties like you want to see them.
  - Zoom to full extent to make sure everything draws.
- Arrows/Leader lines will look bad if converted to geodatabase. (Uncheck arrow symbol layer.)
- Workaround: In ARC select arrows and build line coverages. May be SLOW!
- View, plot and practice with sizes, fonts and reference scales. See what looks best before even creating annotation in Geodatabase.

## Load Annotation

- Create Anno & Feature linked Anno based on design plan & observations in ArcMap.
- Feature linked anno has to be set up with same font & size. (Used for creation of new anno only.)
- Do not register as versioned yet.
- Open saved MXD with coverage anno.
- Use “convert coverage anno” tool on each anno coverage.
- Make sure settings and reference scale is set same as what anno FC was created.

## Build Other Functionality

- Built topology. Save the rules.
- Create Versions.
- Register as Versioned all Feature Datasets.
- Assign privileges.
- Analyze.
- Build attribute indexes.
- Do NOT version a Feature Data Set until you are done creating all feature classes, topology and done loading all data, including annotation
- Take a breather! Start editing data...

## Reload Data (non-anno)

- Run export to coverage process in Librarian or ArcStorm for all data & anno
- Unregister as Versioned first.
- May use same methods to reload. Keep in mind pros/cons of each.
- “cov2sde -o init...” cmd line in batch file. “init” loads while first deleting all records.
- Use cmd line to truncate layers and tables, then use ArcCatalog to load.
- In ArcCatalog, can't load if relationship/anno on FC or FC in topology.  
Workaround: Use cmd line, Use ArcMap "load Objects" or Drop Topology and/or Feature linked anno & load with ArcCatalog.

## Reload Annotation

- Unregister as Versioned first.
- Empty Anno FC –
  - In ArcMap when use convert tool, prompted to delete existing. SLOWER than load when lots of anno.
  - Annotation (non-feature linked) can be truncated with sdelayr & sdetable cmd line.
  - Feature Linked anno trickier, cmd line truncate may not work. Drop entire FC and then recreate in ArcCatalog
- After anno is empty, Load using saved MXD and convert tool.

## Reload Guidelines 8.3

- Line/Point/Polygon Features:
  - If NO anno/relation, cov2sde –o init
  - If anno/relationship & NO subtype, cov2sde –o init
  - If anno/relationship/topo & Subtype, drop linked anno/relation/topo & FC, recreate with import & load subtypes in ArcCatalog. Recreate relationships.
- Annotation
  - Non-linked: use cmd line to truncate
  - Linked: use ArcCatalog to Delete, & recreate
  - Use Saved MXD to reload.

## Other Geodatabase Quirks

- Cannot have Unique index on versioned data (editable data).  
Workaround: Use stored procedure run nightly or on post of version.
- History with Versions? Yea right... Only if you never plan to compress your database or make structural edits. Workaround: Use database fields or subtypes as inactive or export important features to shapefile monthly & archive.

## Maintenance

- Watch database performance (RDBMS specific, Spatial Indexes, Attribute Indexes can be altered.)
- In making structure changes
  - Reconcile ALL versions

- Run Compress
- “Unregister as versioned”
- Can build batch or VB for this.
- Analyze (generate statistics) often.
- Listen to GIS Editors.

## Summary

- Take advantage of Relational/Spatial Database and ArcSDE Server technologies.
- ESRI support web site & ArcGIS Desktop help & regional staff were my best buds.
- Document lessons learned along the way.
- You will be successful!

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