

# Managing CAD and Enterprise Geospatial Data on a Military Installation (GS1641)

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# Class Summary

As a working Geospatial/CAD manager on a military installation, it is a juggling act to manage all aspects of the job. The U.S. Air Force 3E5X1 (Engineers) career field's increasing requirement for Autodesk® training has changed the way we manage our CAD as-built and geospatial enterprise data.

Over the years, we've managed to overcome some I.T. woes, streamlined our business process model, developed best practices, and established training program.

# Disclaimer:

- Only speaking for Nellis AFB
- No Magic Trick
- 3E5X1: Primary software (Autodesk MAP3D<sup>©</sup>)

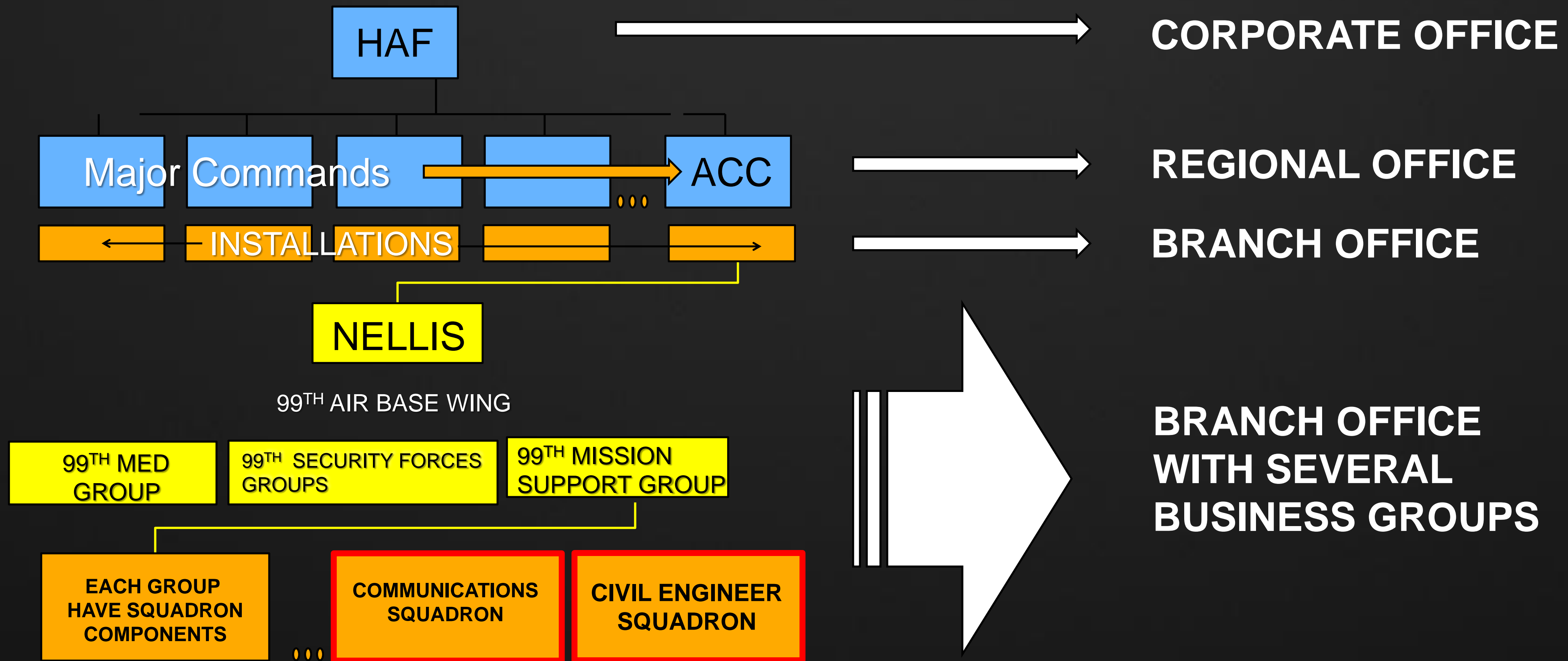
# Learning Objectives

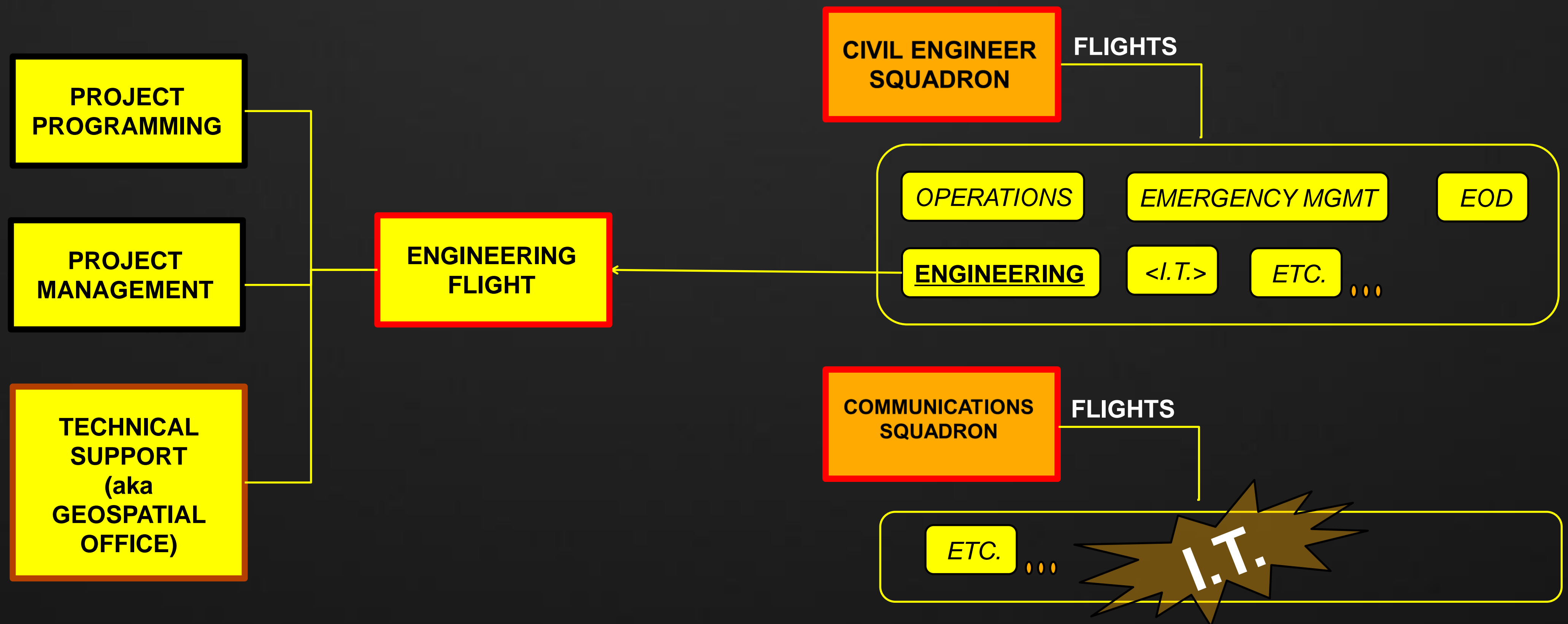
- Share day-to-day best practices and training strategies at Nellis Air Force Base
- Use Map 3D to manage CAD using GIS database connection
- Identify various shortfalls of AutoCAD Map 3D
- Managing survey data
- Identify I.T. issues

# Agenda

- How do we compare to Corporate America?
- Managing our Enterprise Data and supporting customers
- Some Pros and Cons
- I.T. = An INCONSISTENT TRUTH
- Training
- Results and Way Ahead

# How do we compare to Corporate America?



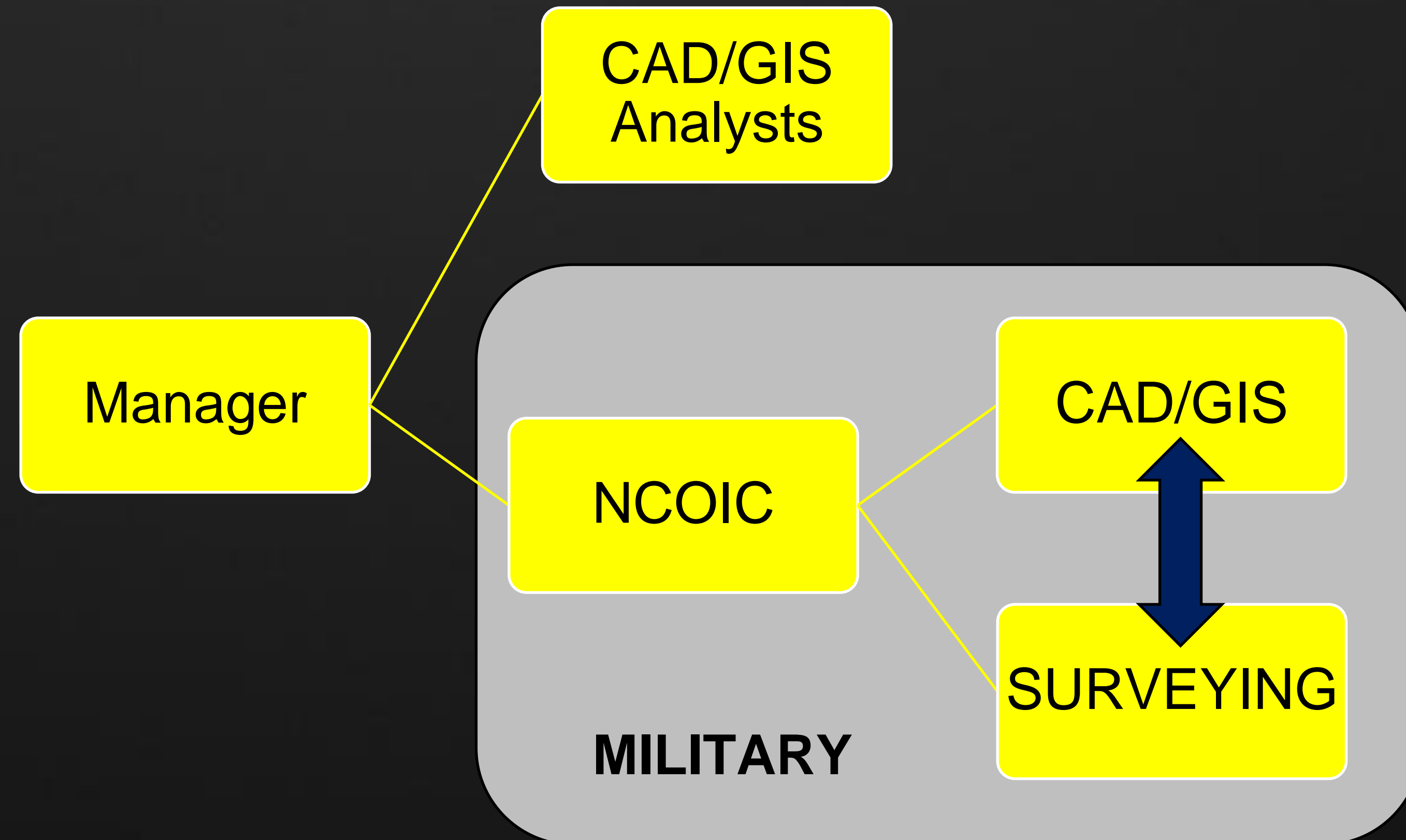




# 99<sup>th</sup> CES Geospatial Office Team Set-up

## MANNING:

**17% CIVILIAN (3)**  
**83% MILITARY (12)**



3.10.11. ESTABLISHES INTEGRATED PRIORITY LIST FOR ALL INFRASTRUCTURE REQUIREMENTS	CEPT
<b>TECHNICAL SUPPORT ELEMENT</b>	<b>CEPT</b>
4. MANAGES DRAFTING AND DRAWING VAULT	CEPT
4.1. MANAGES RECORD DRAWINGS	CEPT
4.1.1. UPDATES AS-BUILTS FOR OPERATIONS FLIGHT WORK	CEPT
4.1.2. CHECKS AS-BUILTS PROVIDED BY OTHERS FOR ACCURACY AND ADHERENCE TO DRAFTING STANDARDS	CEPT
4.1.3. FILES/MAINTAINS AS-BUILTS IN ELECTRONIC AND/OR HARD COPIES	CEPT
4.1.4. MANAGES AS-BUILT DATABASE/INVENTORY	CEPT
4.1.5. UPDATES BASE MAPS TO REFLECT AS-BUILT CONDITIONS	CEPT
4.1.6. UPDATES MASTER FLOOR PLANS TO REFLECT AS-BUILT CONDITIONS	CEPT
4.2. PERFORMS NON-DESIGN REPRODUCTION	CEPT
4.3. REPAIRS AND MAINTAINS DRAWINGS	CEPT
5. PERFORMS ENGINEERING SURVEYS	CEPT
5.1. PERFORMS AIRCRAFT MISHAP/ACCIDENT INVESTIGATION	CEPT
5.2. COLLECTS AND ANALYZES GPS DATA	CEPT
5.3. PERFORMS SOILS CLASSIFICATION	CEPT
5.4. PERFORMS CONCRETE, ASPHALT, AND CONCRETE TESTING	CEPT
6. MANAGES GEOBASE	CEPT
6.1. MAINTAINS SERVER	CEPT
6.2. MANAGES GEOBASE WORKING GROUP	CEPT
6.3. PERFORMS DATA CONVERSION	CEPT
6.4. PREPARES MAPS FOR OTHERS	CEPT
6.5. CHAMPIONS RESOURCES	CEPT
6.6. UPDATES/MAINTAINS PROGRAMS FLIGHT SPECIFIC INFRASTRUCTURE TABS	CEPT
6.7. ASSISTS OTHER AGENCIES IN UPDATING UTILITY, INFRASTRUCTURE, AND FACILITY TABS (SUPPORT COMMUNITY PLANNER AND SHOPS)	CEPT
6.8. ENSURES COMPLIANCE WITH TECHNICAL STANDARDS	CEPT
6.9. SUPPORTS A&E SUBMITTAL REQUIREMENT AND REVIEW A&E PRODUCTS FOR COMPLIANCE	CEPT
6.10. MANAGES COMPUTER HARDWARE RELATED TO GEOBASE	CEPT
7. PERFORMS AND PROVIDES TRAINING	CEPT
7.1. PERFORMS MILITARY WARTIME SKILL	CEPT
7.2. ATTENDS RECORDS MANAGEMENT TRAINING	CEPT
7.3. ATTENDS AUTOCAD, GIS, SOFTWARE TRAINING	CEPT
7.4. ATTENDS CONTINGENCY/NATURAL DISASTER OPERATIONS	CEPT

## Civil Engineer Squadron PAD (2008) Appendix D – Flight Task Lists

# Our Mantra:

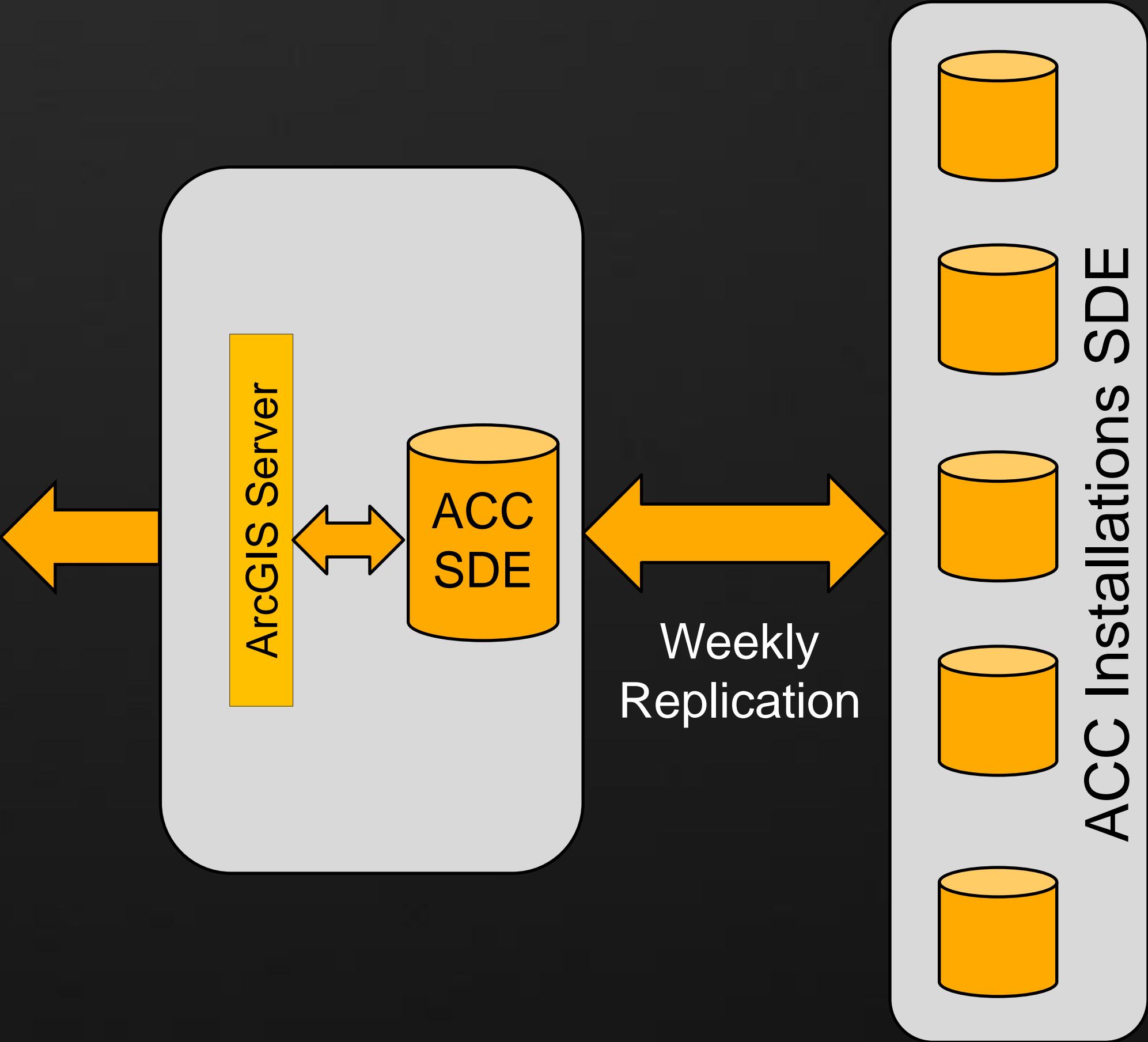
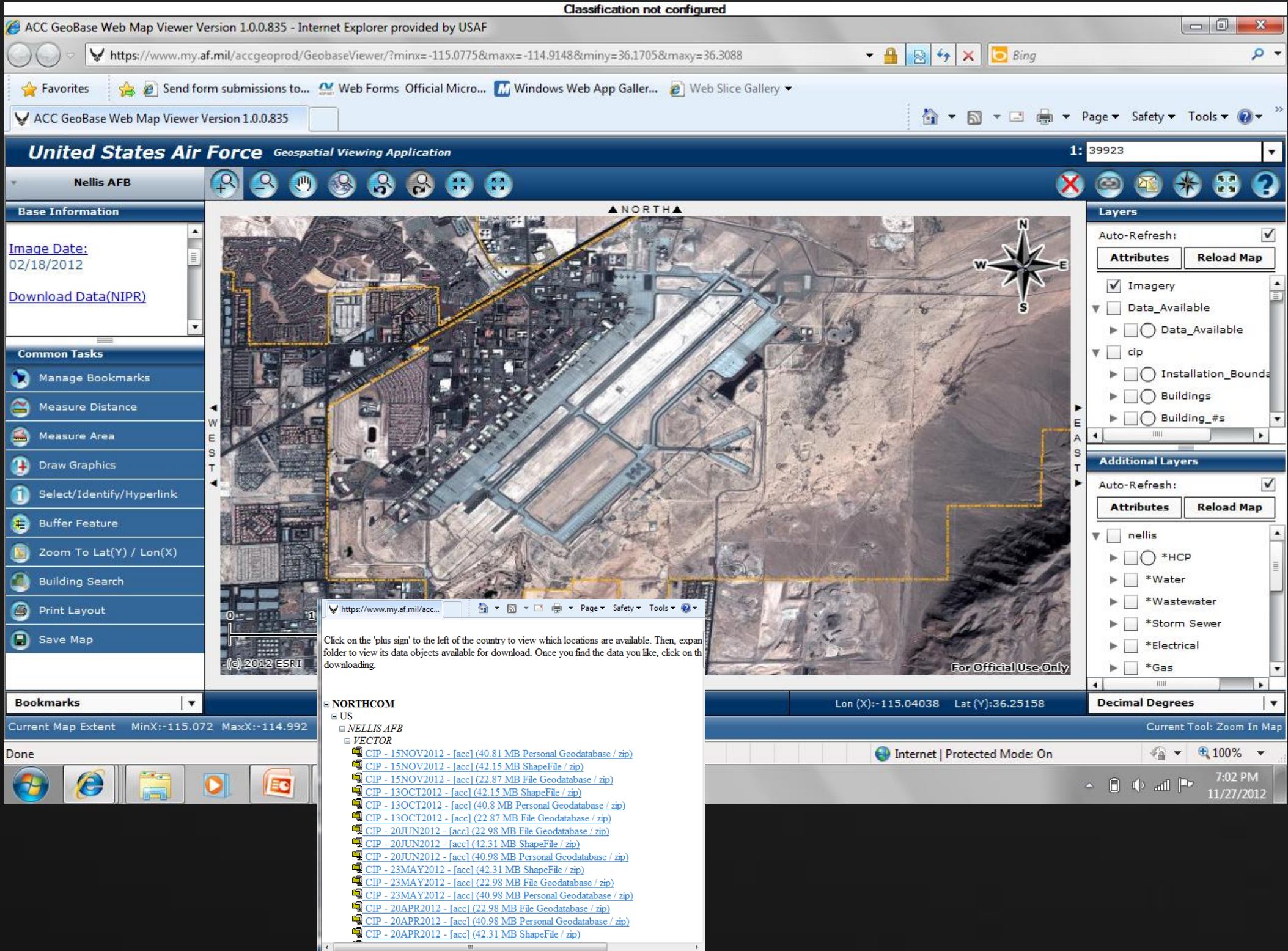
**“Update map and manage records”**

**...and make customers happy!**

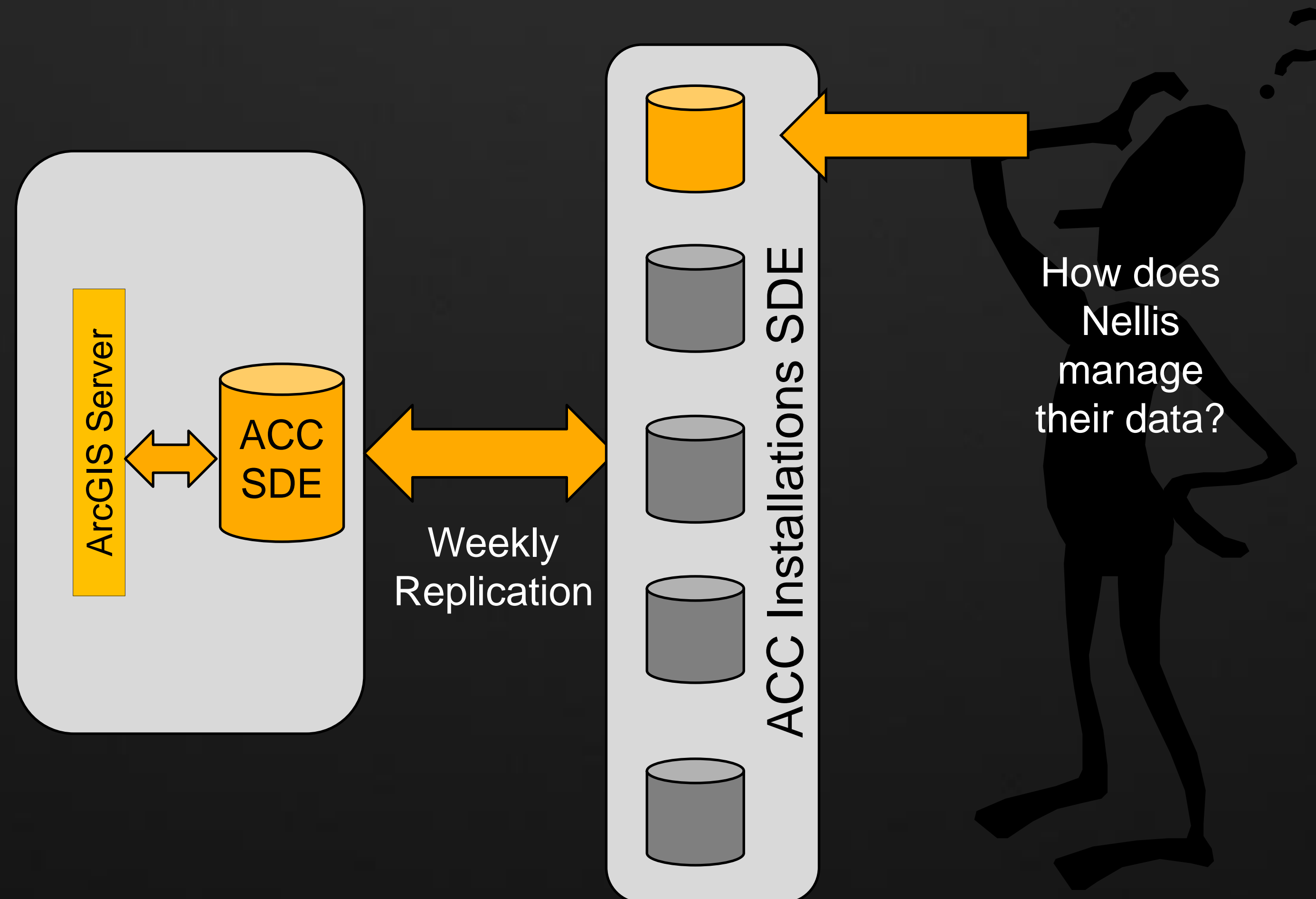


# Managing our Enterprise Data and customer support

# Spatial Systems Architecture

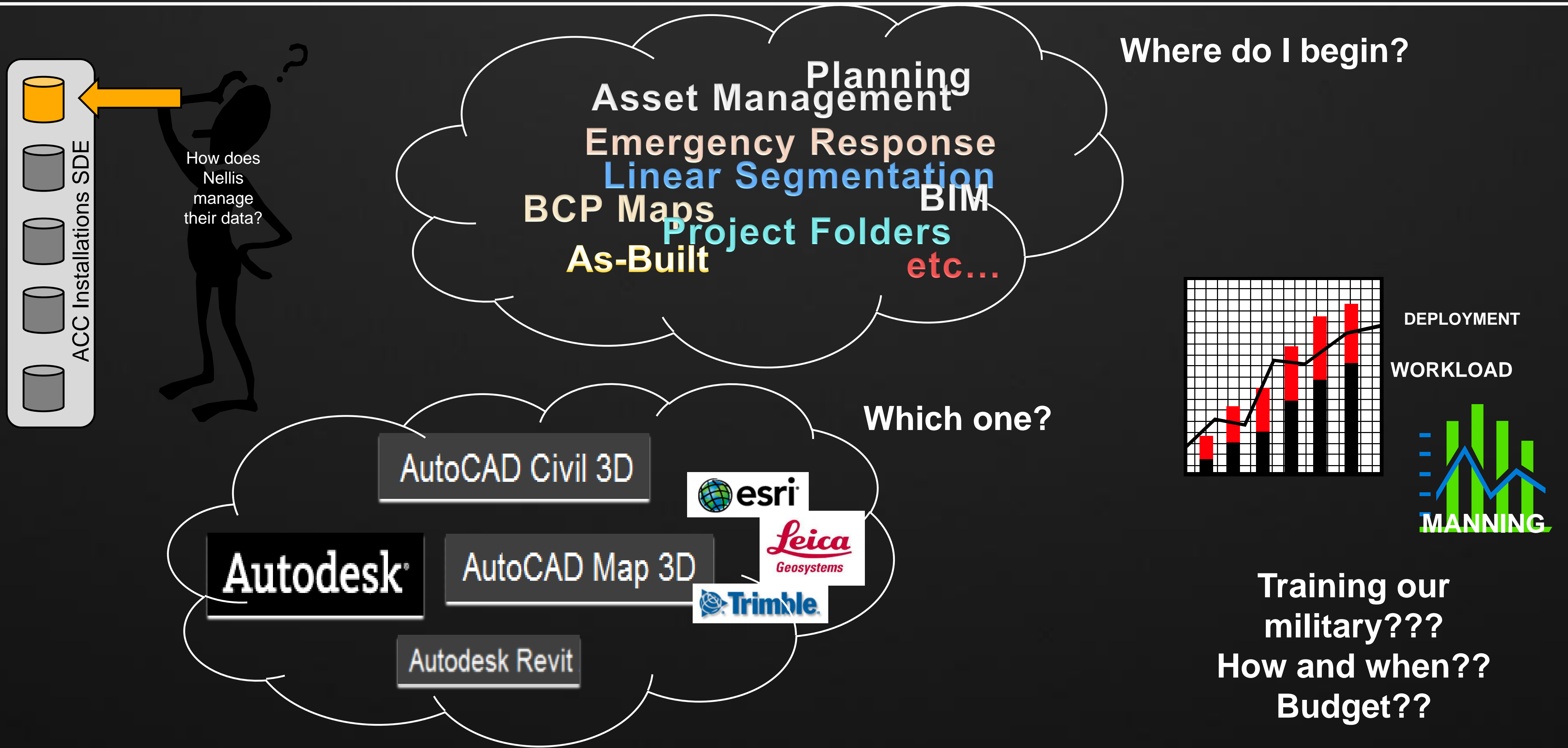


# The Questions...





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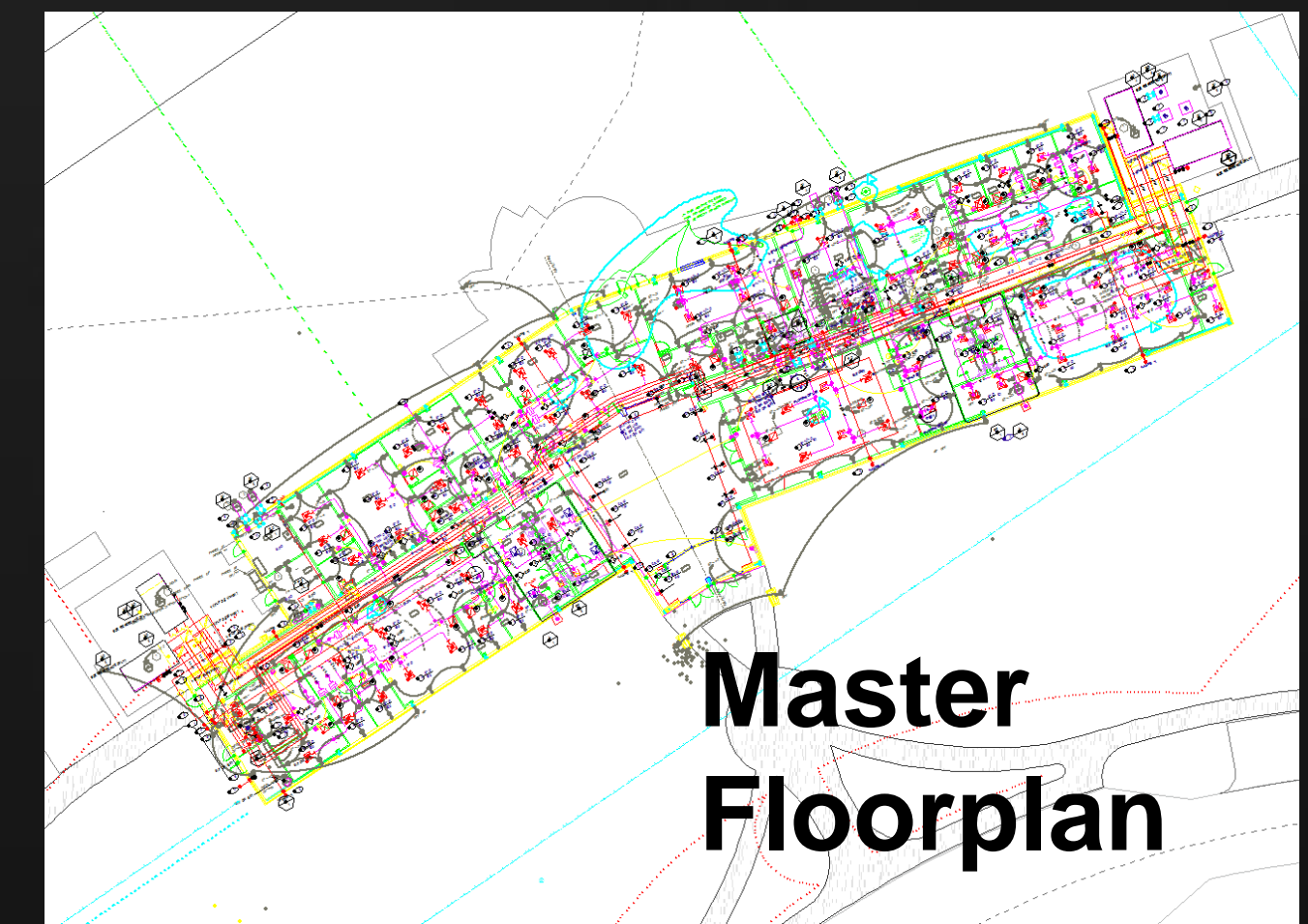
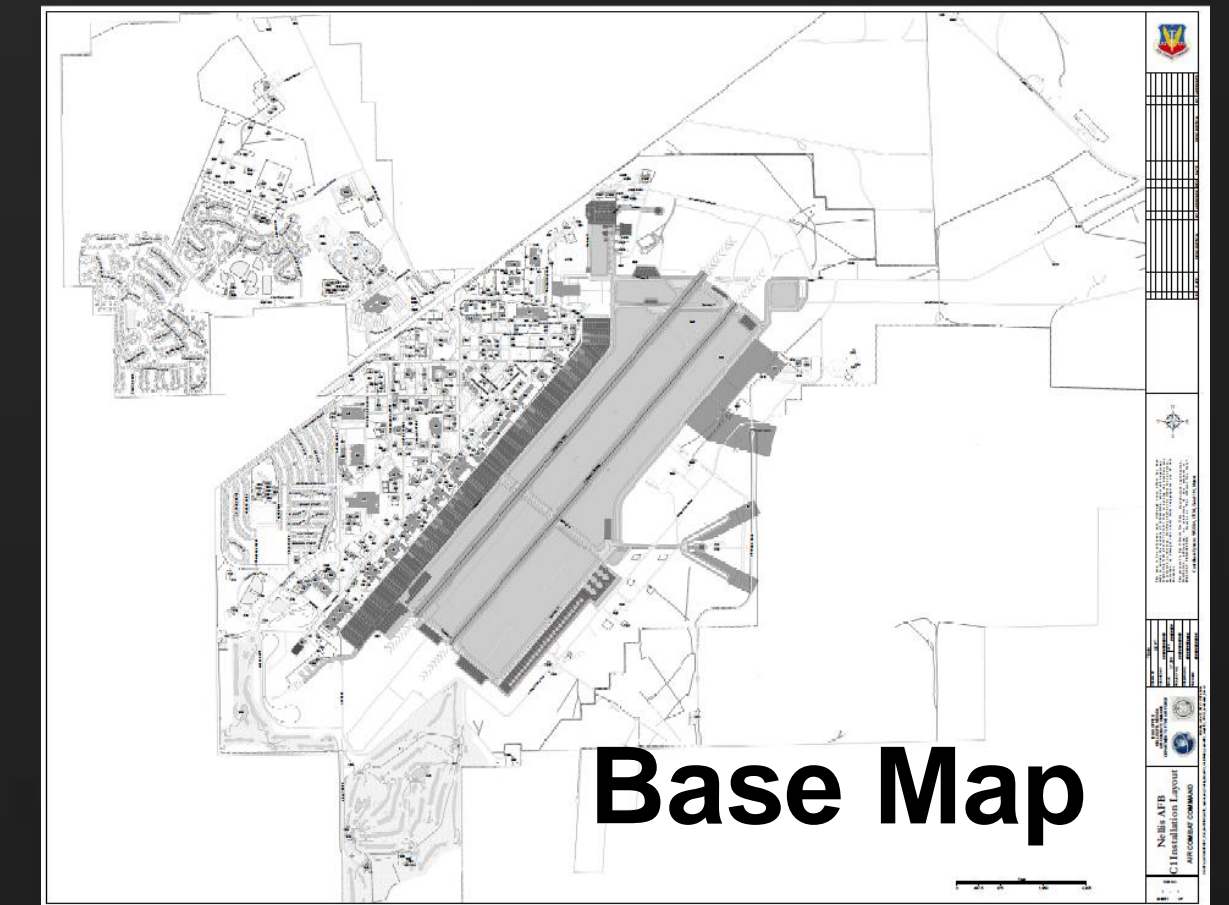
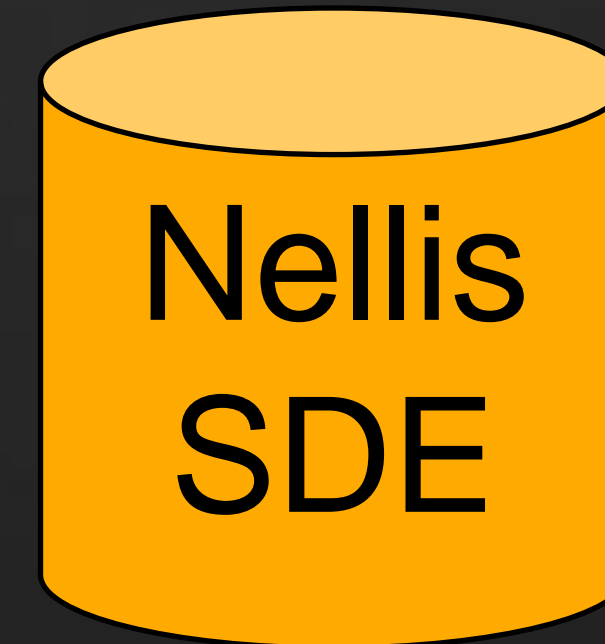
# Building the Business Process Model

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- Fixing from within...
- Prioritize: Fix what you can
- Don't end the good
- Think different: BE CREATIVE!

# Building the Business Process Model

- Records Management
- As-Built Management
  - Master Floor Plan
  - Base Comprehensive Plan Maps
    - *(or Common Installation Picture - CIP)*
- Data for outside Engineering firms
- Survey Data Management





# Building the Process Flow Chart

WARNING: VERY PRIMITIVE PROCESS!!!

## Records Management:



\*Contract requirements:

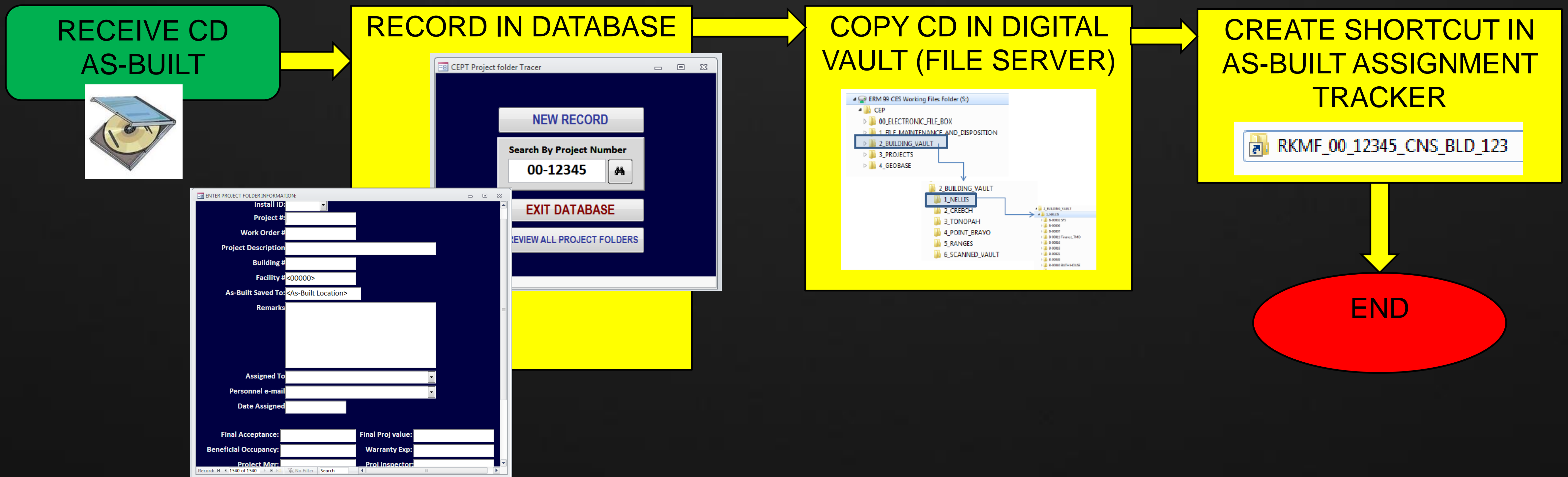
- No more hard copies

- \*.PDF, \*.DWG, Raw survey data (include \*.CSV)

# Building the Process Flow Chart

WARNING: VERY PRIMITIVE PROCESS!!!

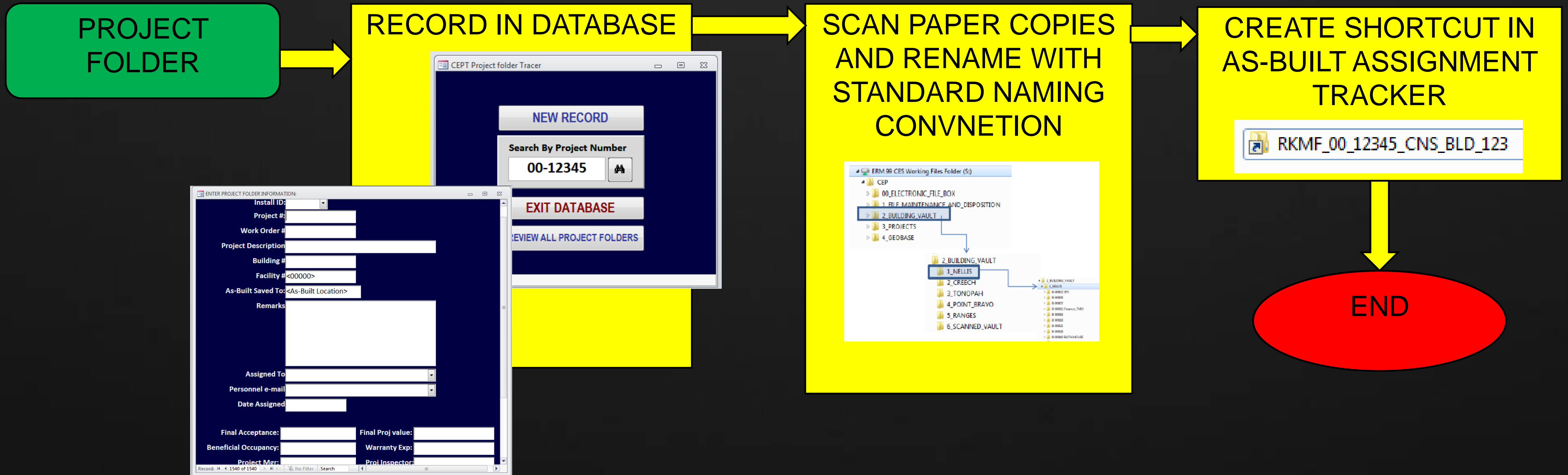
- Records Management – As-Built Softcopy



# Building the Process Flow Chart

WARNING: VERY PRIMITIVE PROCESS!!!

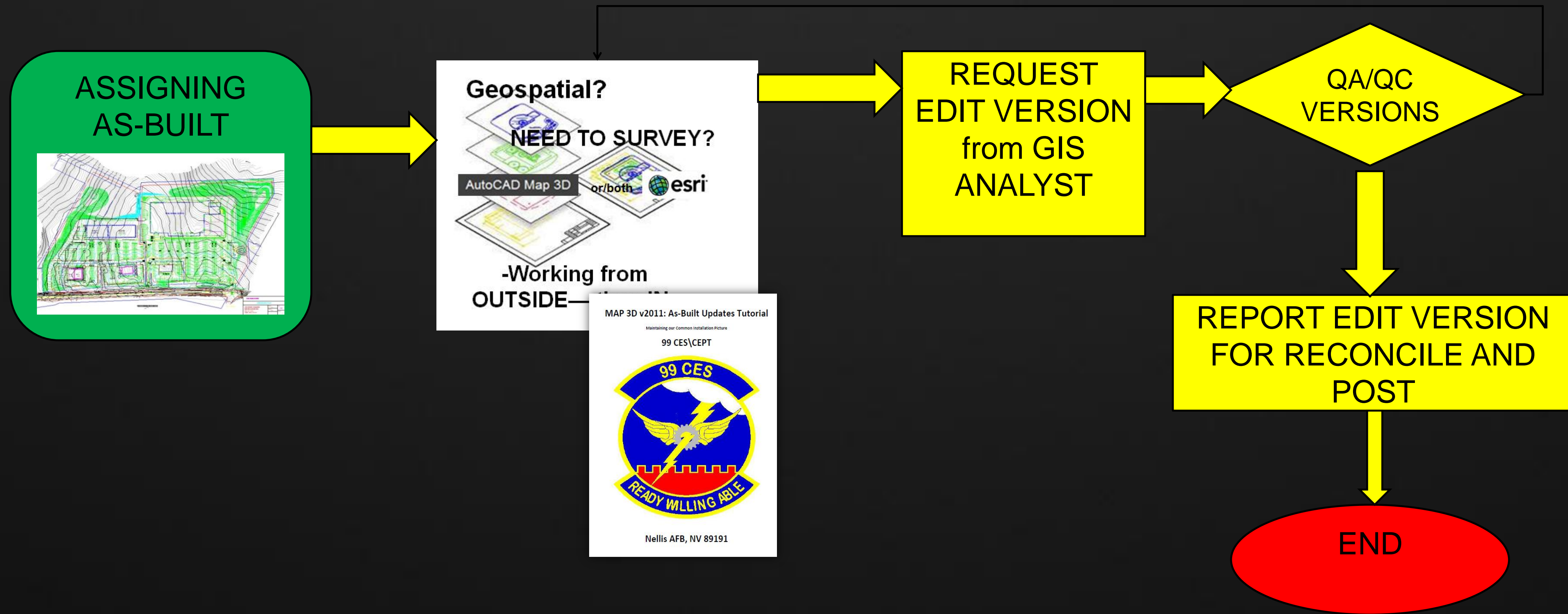
- Records Management – As-Built Paper copy





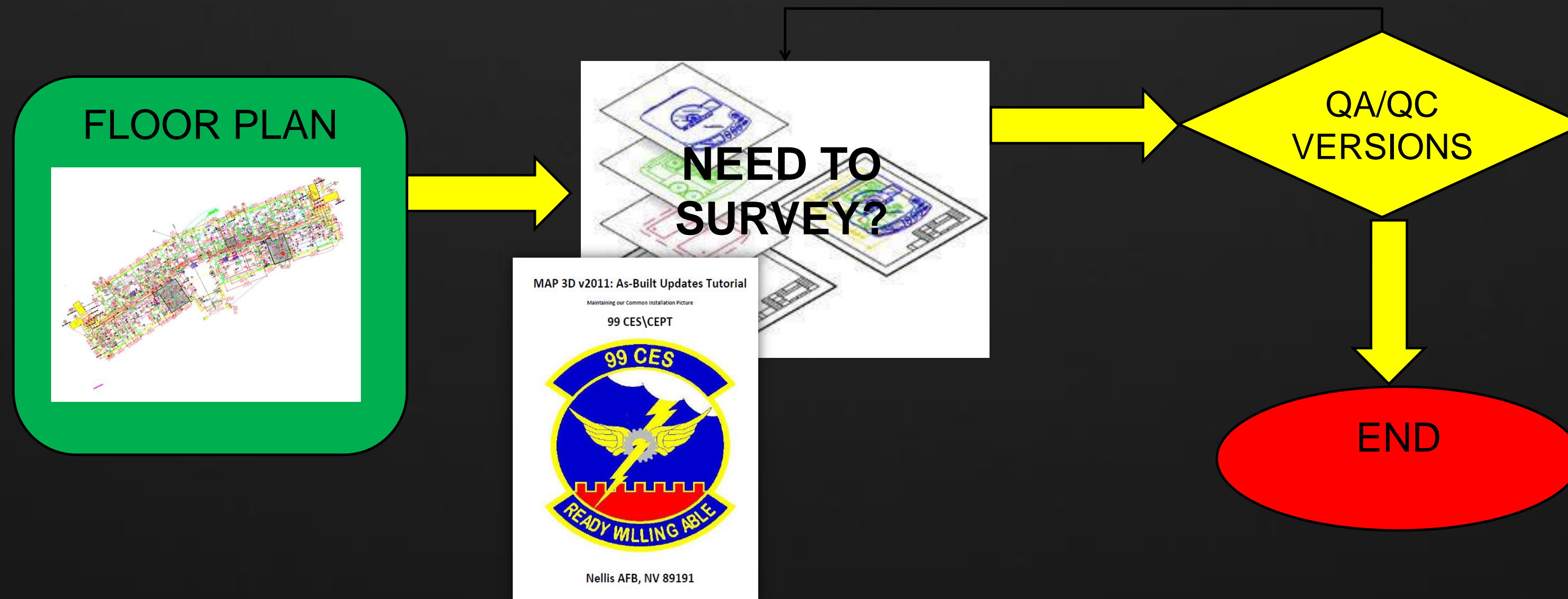
# Building the Process Flow Chart

- As-Built Management – PART 1 (working from the OUTSIDE)



# Building the Process Flow Chart

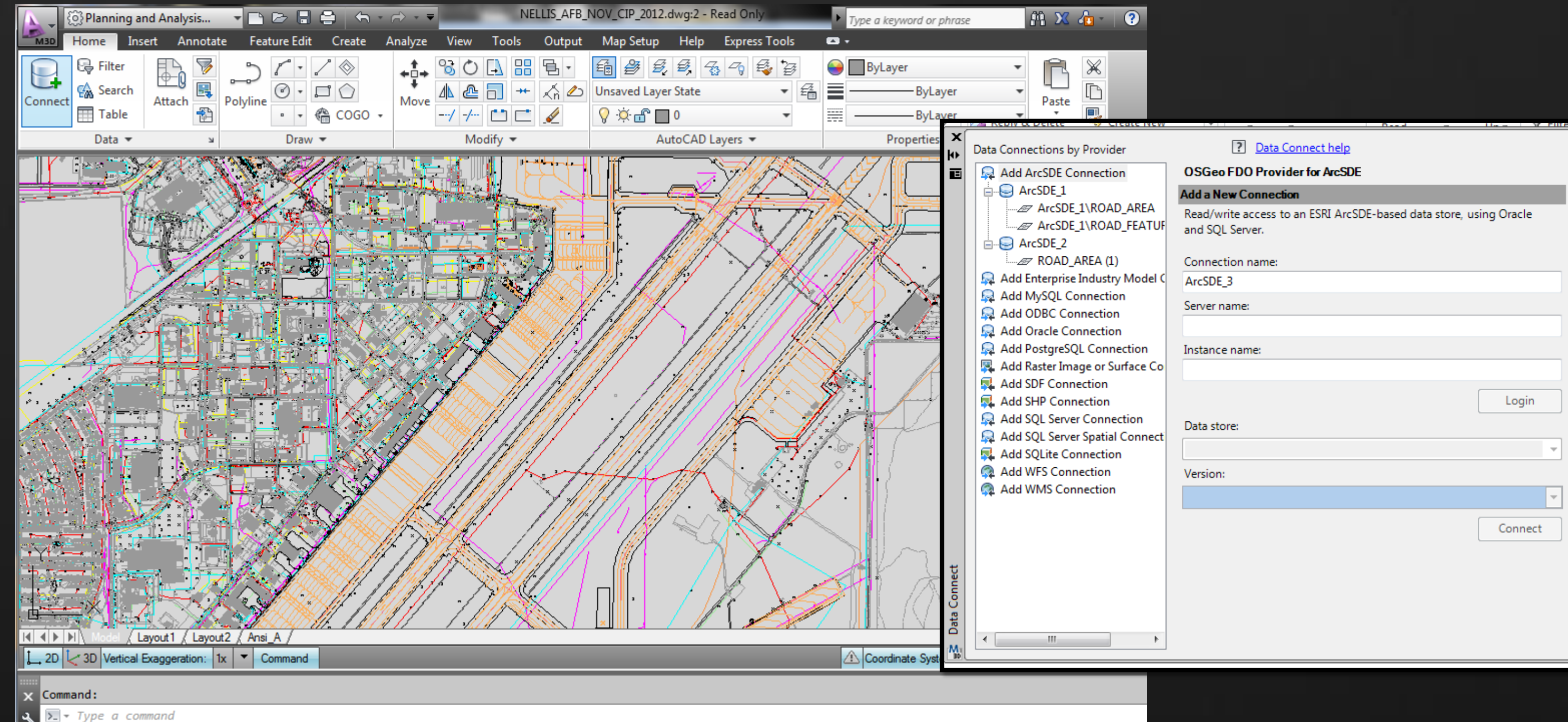
- As-Built Management – PART 2 (then IN)





# Building the Process Flow Chart

## GIS to CAD



\*Done once a month

# Building the Process Flow Chart



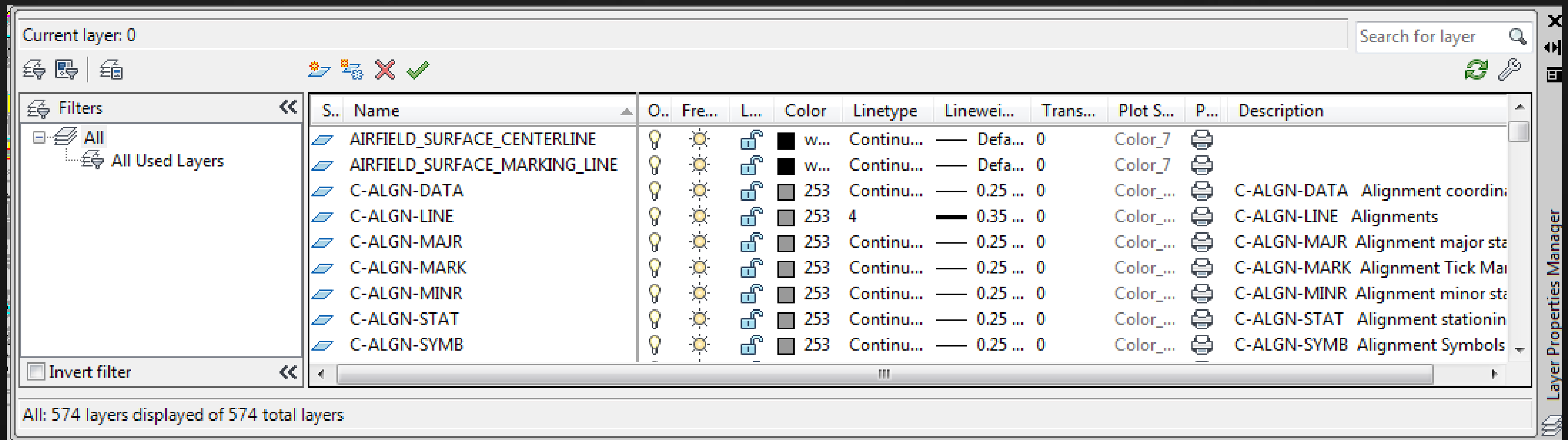
## SPATIAL DATA STANDARD FOR FACILITIES, INFRASTRUCTURE & ENVIRONMENT (SDSFIE)

SDSFIE 3.0 Goal - One feature, one definition.

The standard is being reengineered from a Physical Data Model (PDM) to a Logical Data Model (LDM). The new LDM will be compliant with existing standards to improve interoperability. A new web-based toolset will accompany the standard to ensure compliance, flexibility, and adaptability. The use of Universal Modeling Language (UML) will make the LDM easier to maintain and will assist subject matter experts in more clearly integrating requirements.

**\*Use of LAYER TRANSLATOR (or LAYTRANS)**

Structure\_existing\_area = C-BLDG-OVHD





# Customer Support

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- What the government provides to outside Engineering companies:
  - ✓ CAD Site Plans
  - ✓ Imagery
  - ✓ Survey Control \*.CSV file

## On military installation customer support:

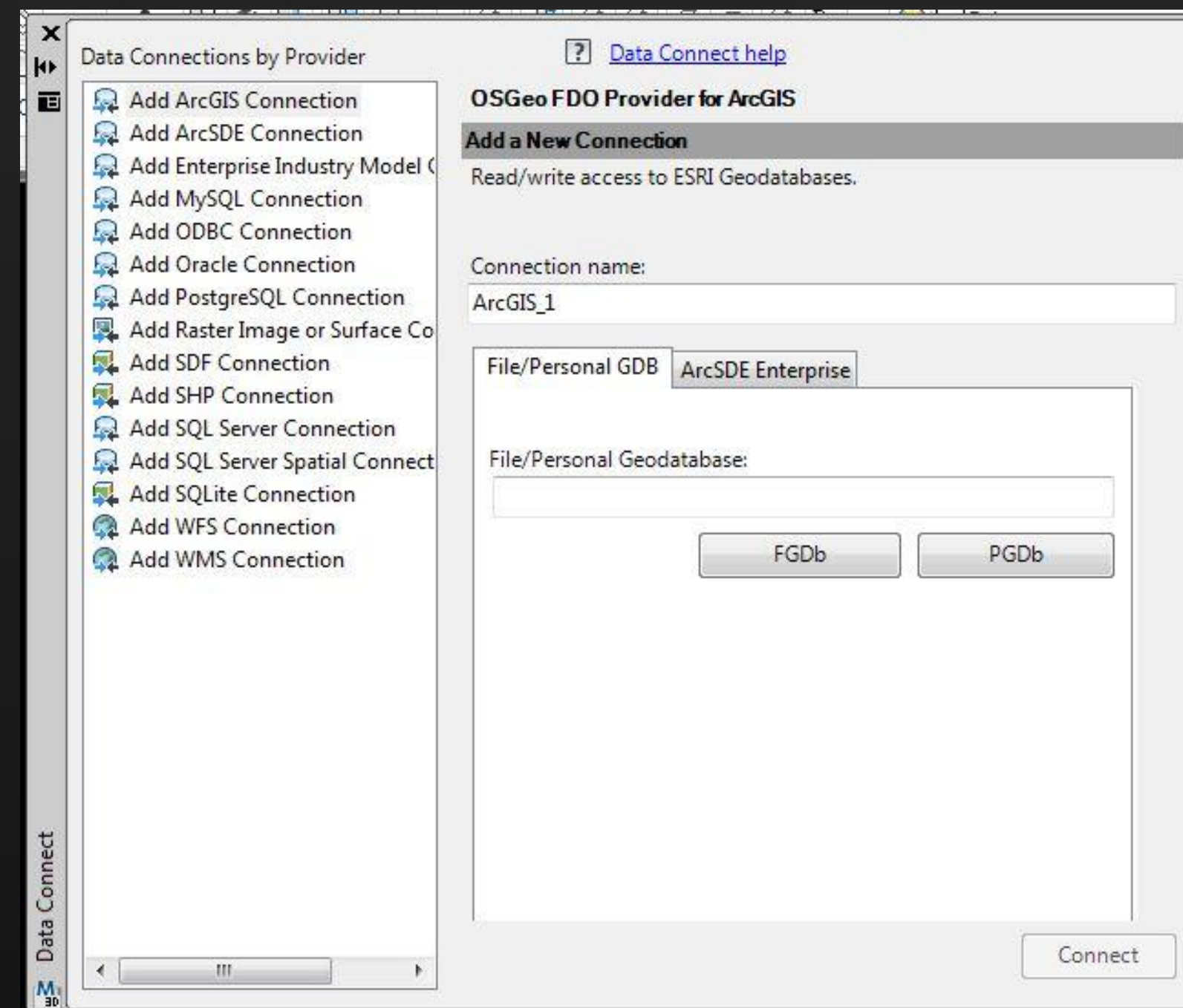
- Web Viewer – GIS and CAD floor plan
  - Map request
  - Facilities management
  - Utilities (Map Books)
- 
- *PROCESS IS IMPORTANT TO CONTINUALLY UPDATE OUR DATA*
- 
- Examples:
- Aviation Nation
  - Road closures
  - Emergency mgmt
  - Security

# Some Pros and Cons on working with GIS data

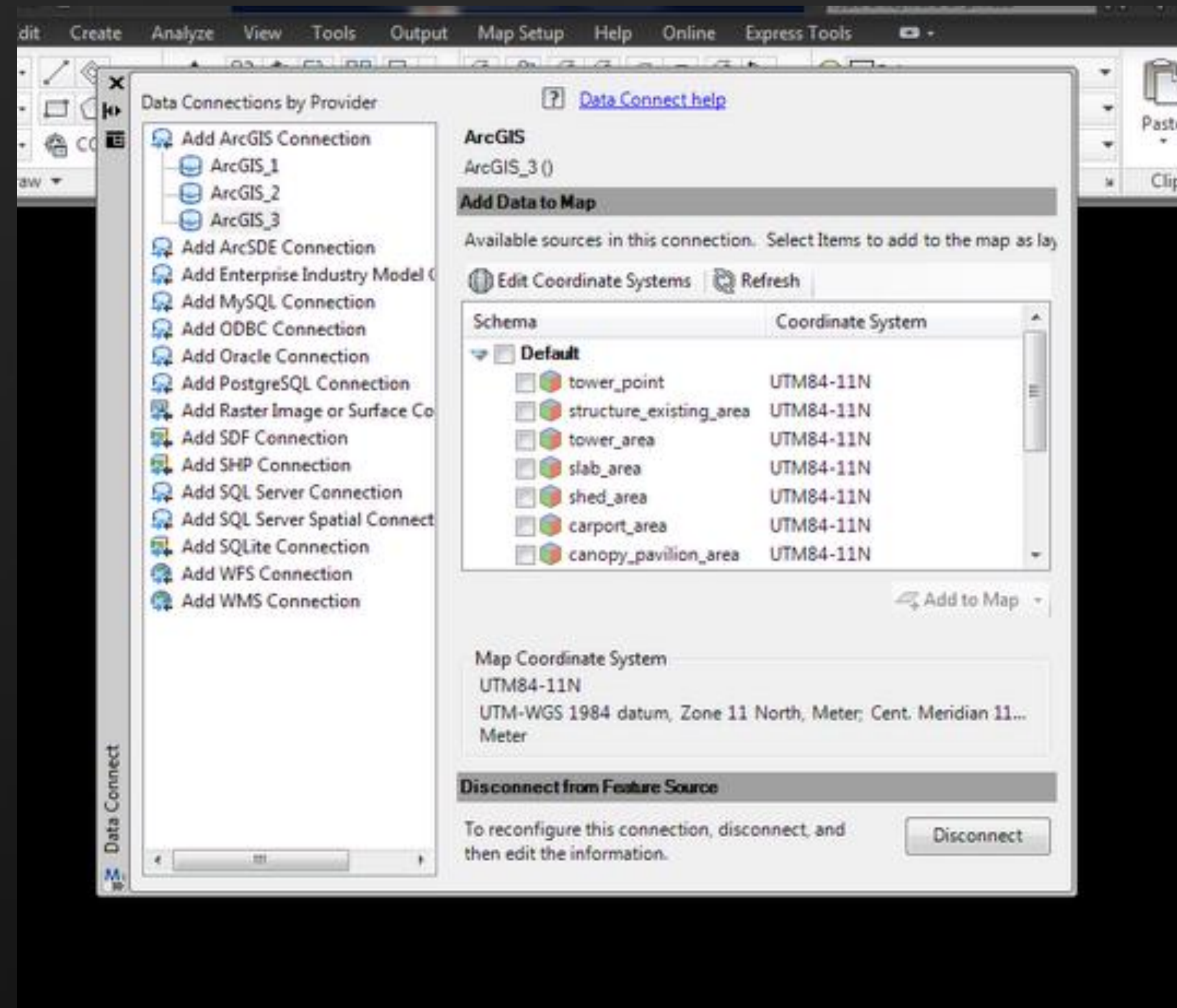


## Version: 2012/2013

- File Geodatabase and Personal Geodatabase connection available (only 32-bit)
  - Caveat: you will need to have ArcMap (ESRI) installed

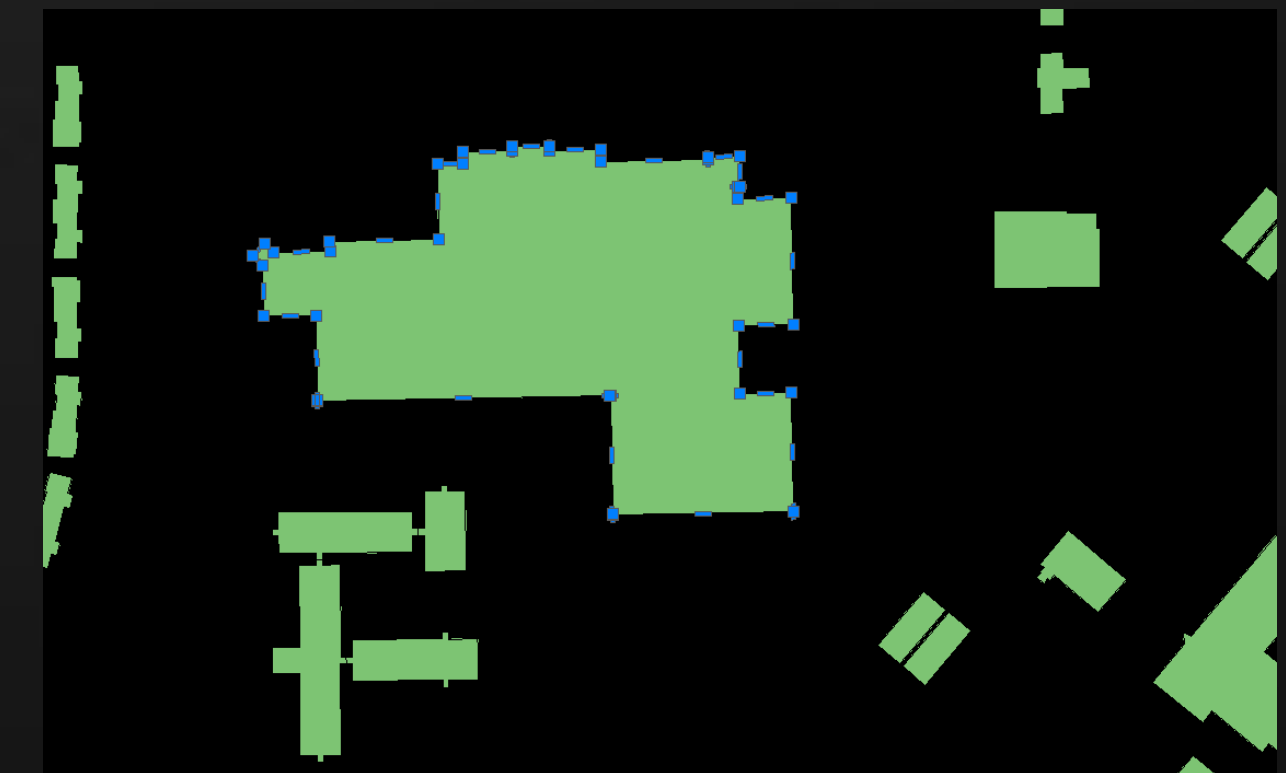
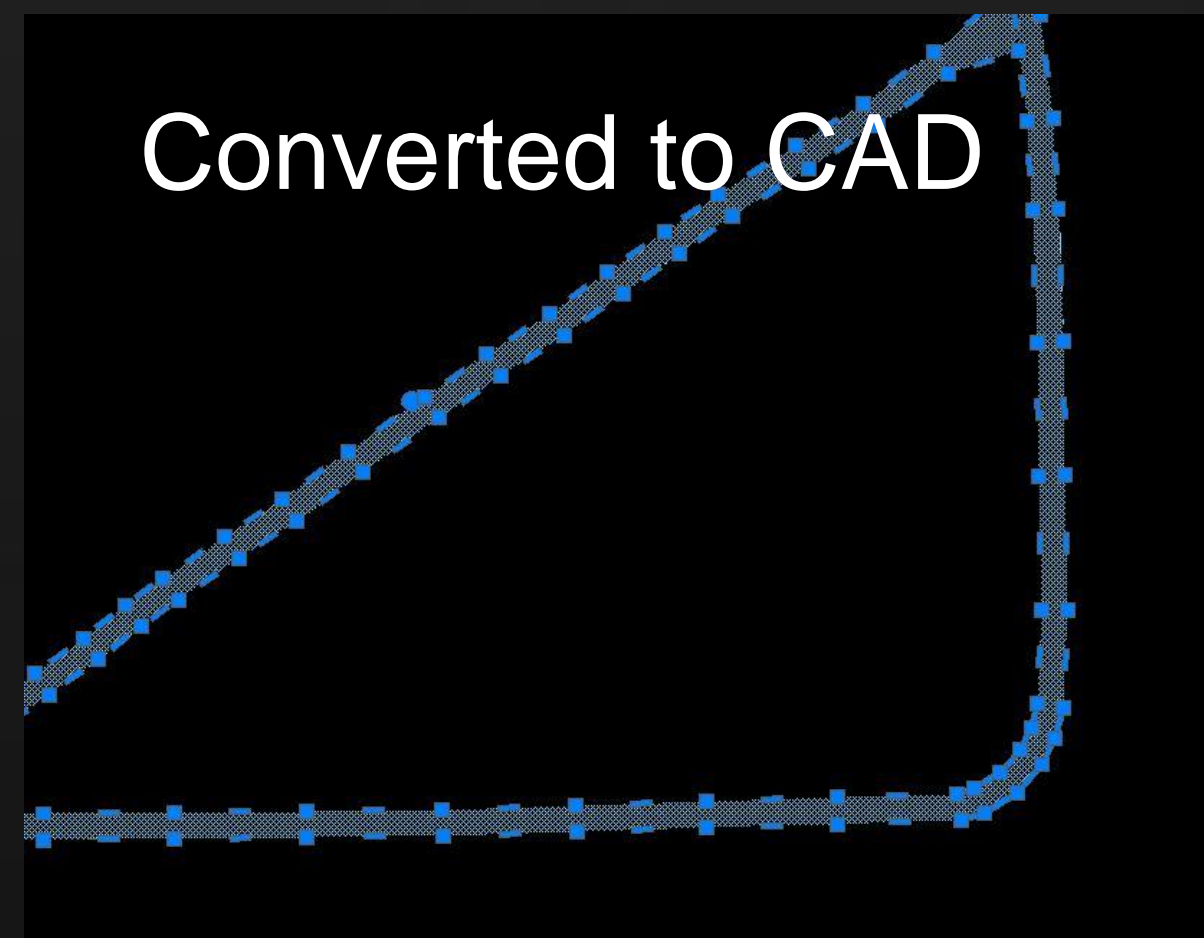
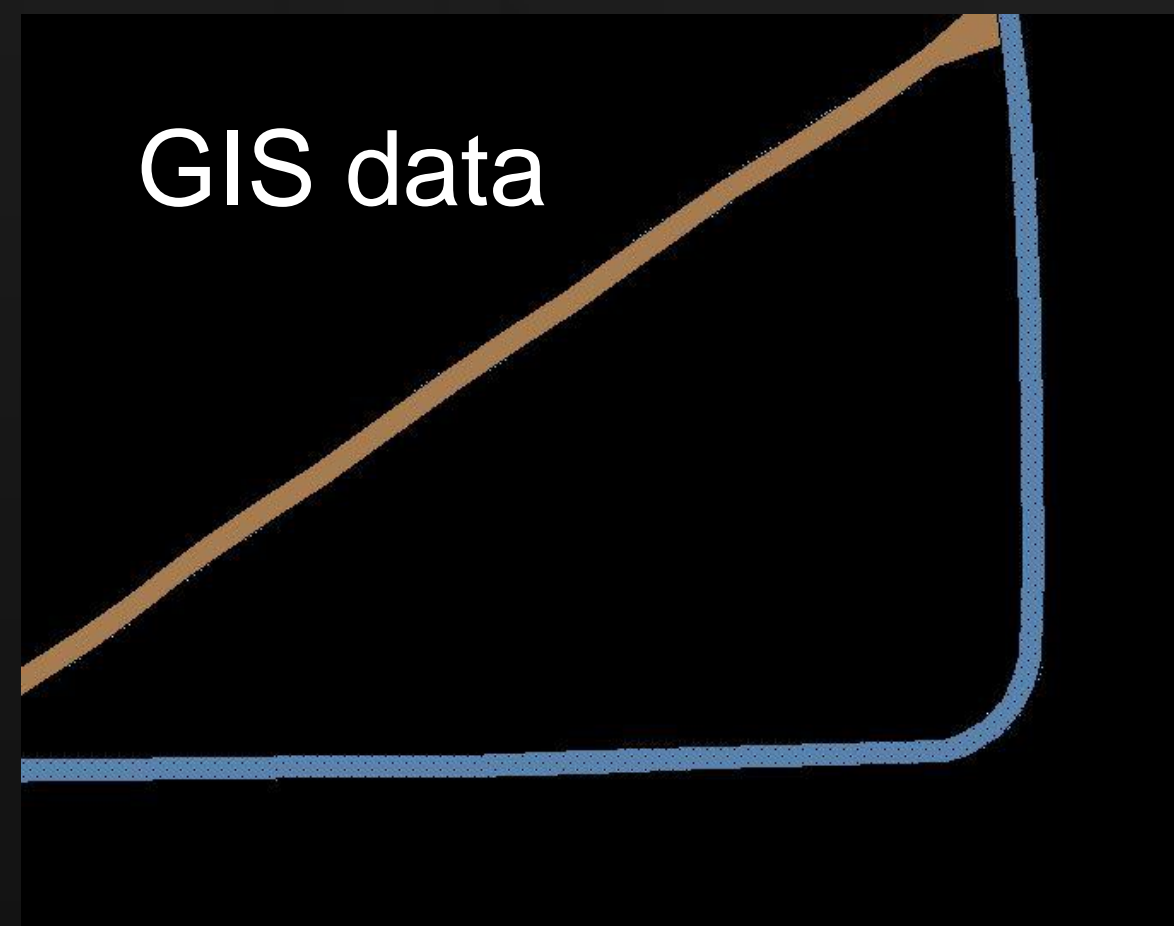
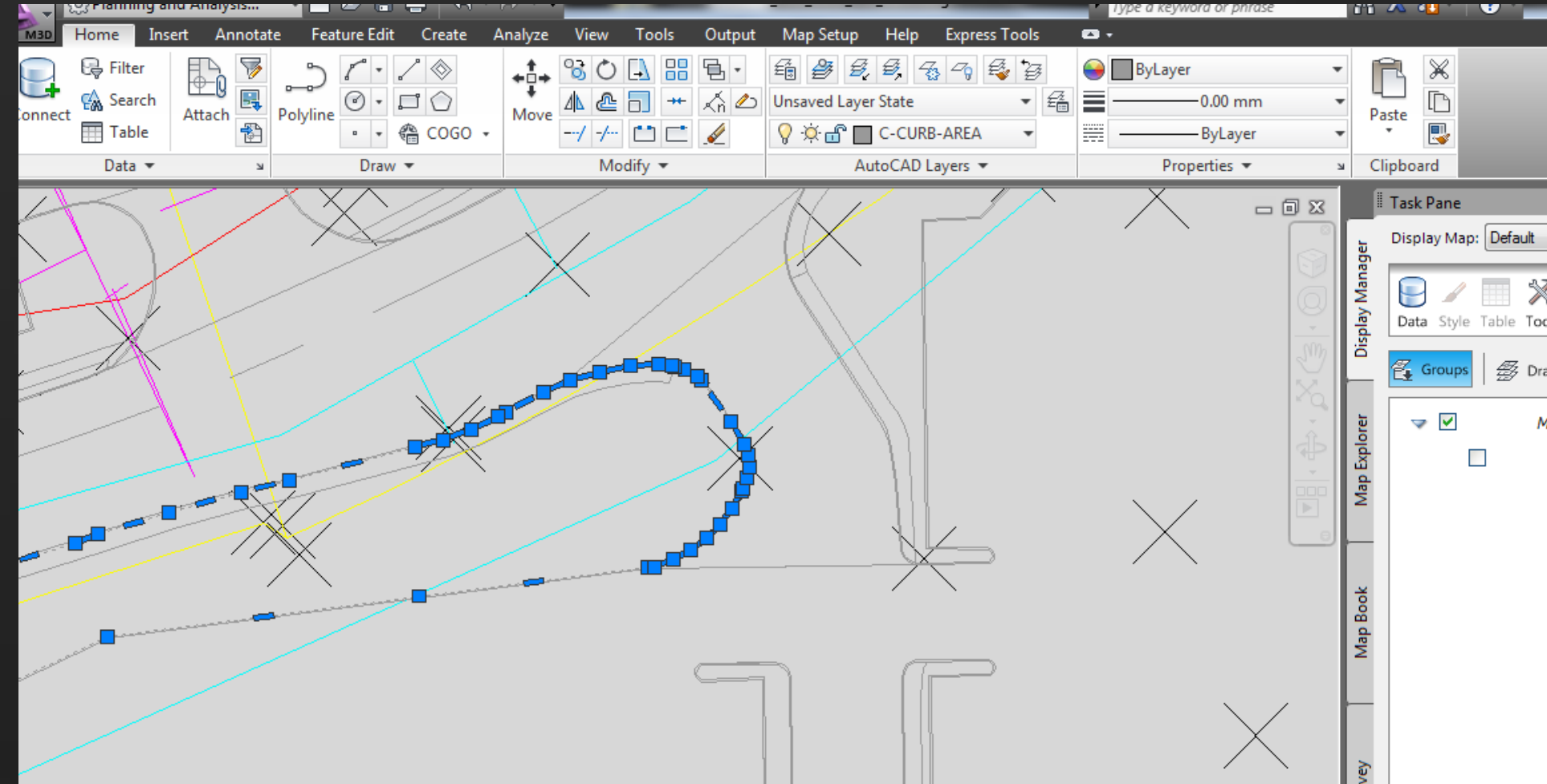


- Schema layers are not alphabetical
- Can't read imagery within this type of data store

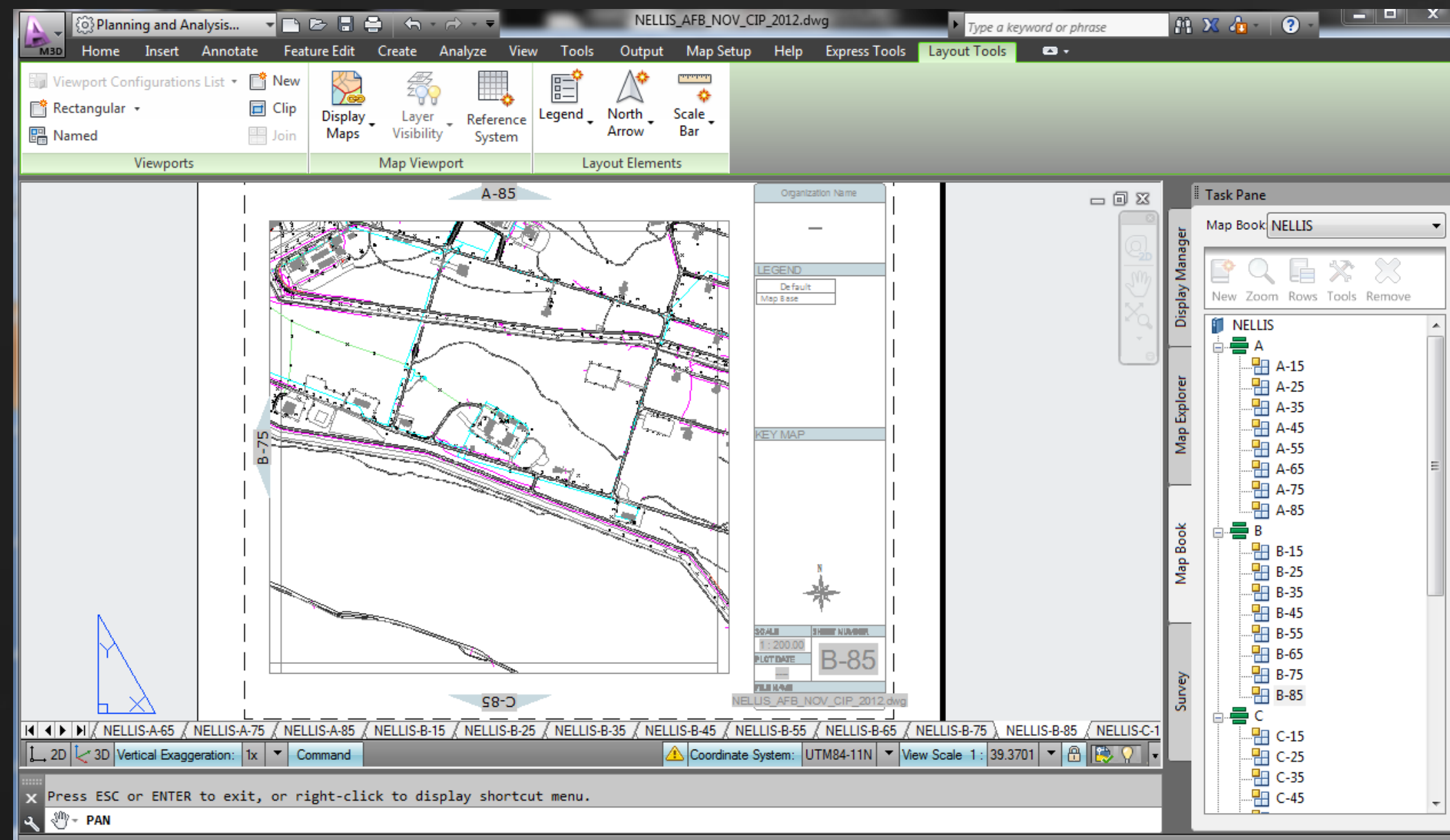




- Creates more vertices when converted to CAD
- Ex. 3 point arc issue

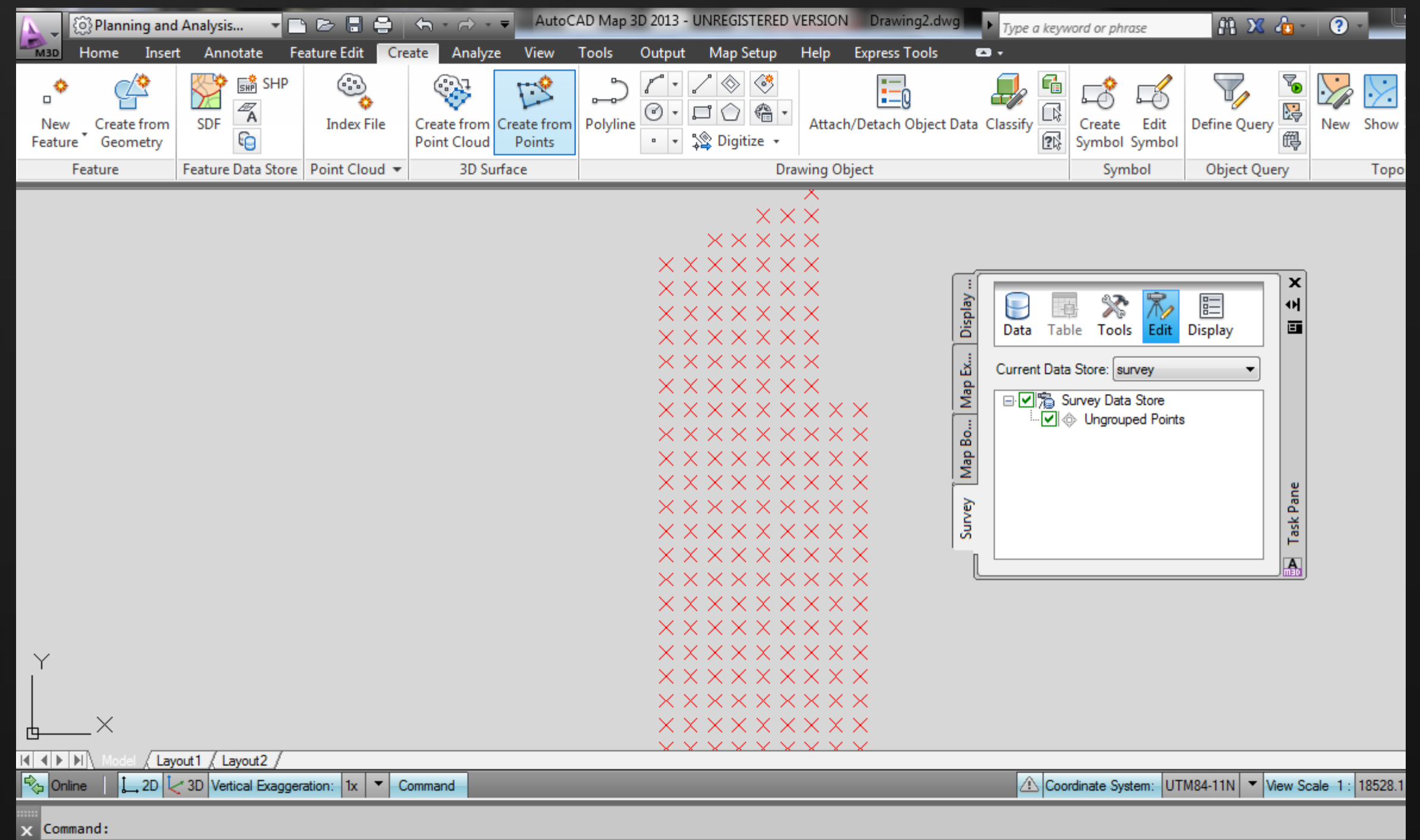






- MapBook

- Import of survey points using ASCII files



# I.T. = An Inconsistent Truth

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## SOFTWARE:

- AutoCAD® Map 3D® 2012/2013
  - Concurrent/Standalone
- AutoCAD® Civil 3D® 2012/2013
  - Concurrent Licenses
- Autodesk REVIT
- Navisworks
- Trimble®link
- Trimble Business Center
- GPS Pathfinder Office
- ESRI ArcGIS
- Etc...

## HARDWARE:

- 64-BIT SYSTEM
- USAF SDC 3.2/3.3



# I.T. Issues



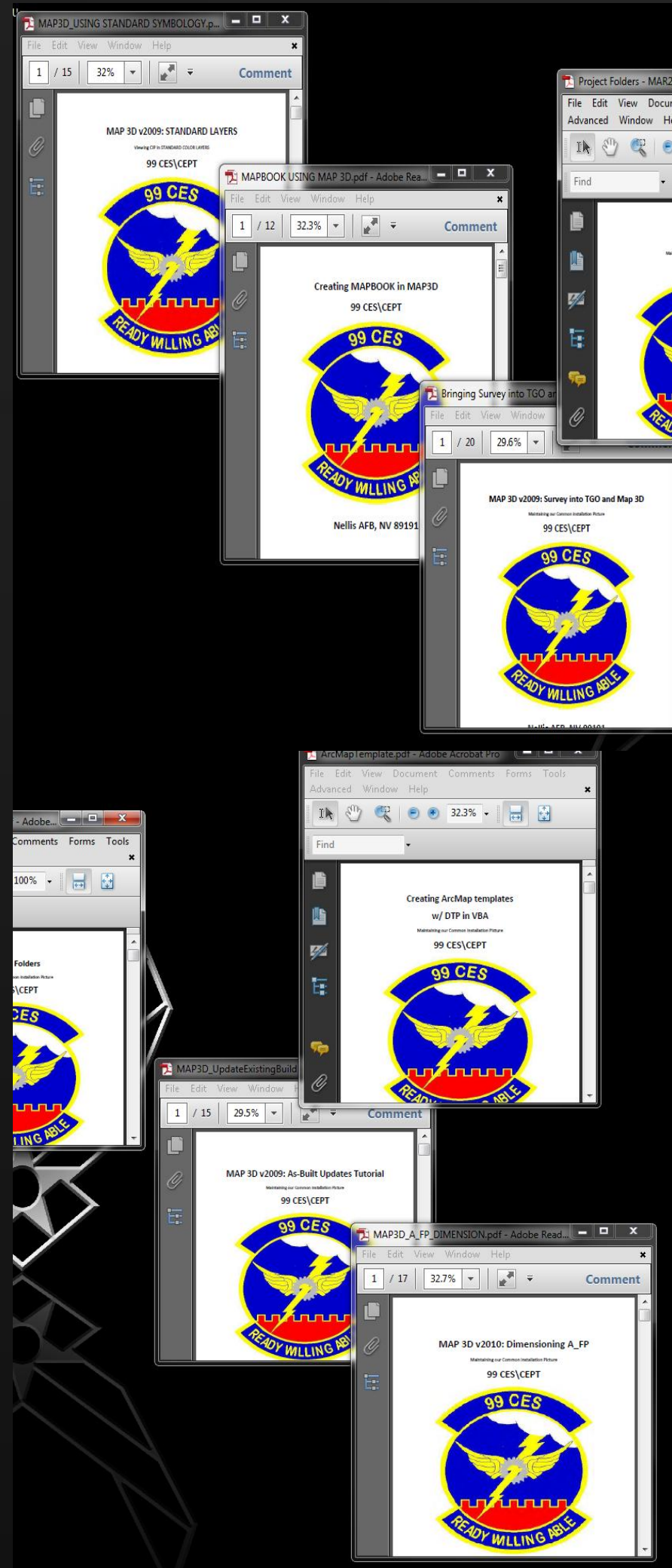
- Use Revo uninstaller for 2011/12
- Logged-on using your profile
- Admin rights
  - Waiting game of administrator availability
- Firewall restrictions
- USB
- File Server space
- Constant push of patches
- Unforeseen workstation re-imaging



# Training



# Create HOW TO



- Find your “experts”
  - Map 3D/Civil 3D/TBC/TGO/ArcMap/*Revit*
- Worked with local company (Holman’s of Nevada) for Civil 3D training:
  - Tailored training
- ACC funded training for TBC/GPS
  - Utilized what my EAs has learned
- EAs coming from another installation, coming back from deployment; use their experience
- Civilians and Contractor : Interacting and training personnel-we provide continuity to keep the program running while military members are deployed

# The Shadow Training Program

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## What is it?

- Train the trainer/mentoring
- Scheduled job training

## Problem?

- Insulting intelligence
- Scheduled training may fluctuates

# The Shadow Training Program

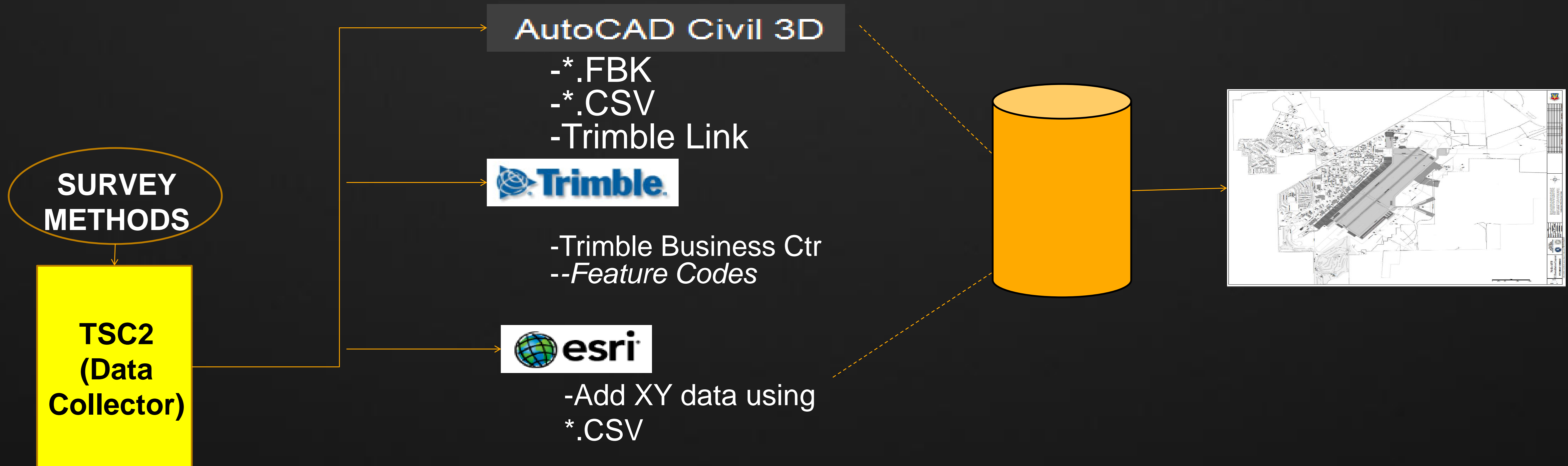
## Schedule:



*-Software Installation training may be included*

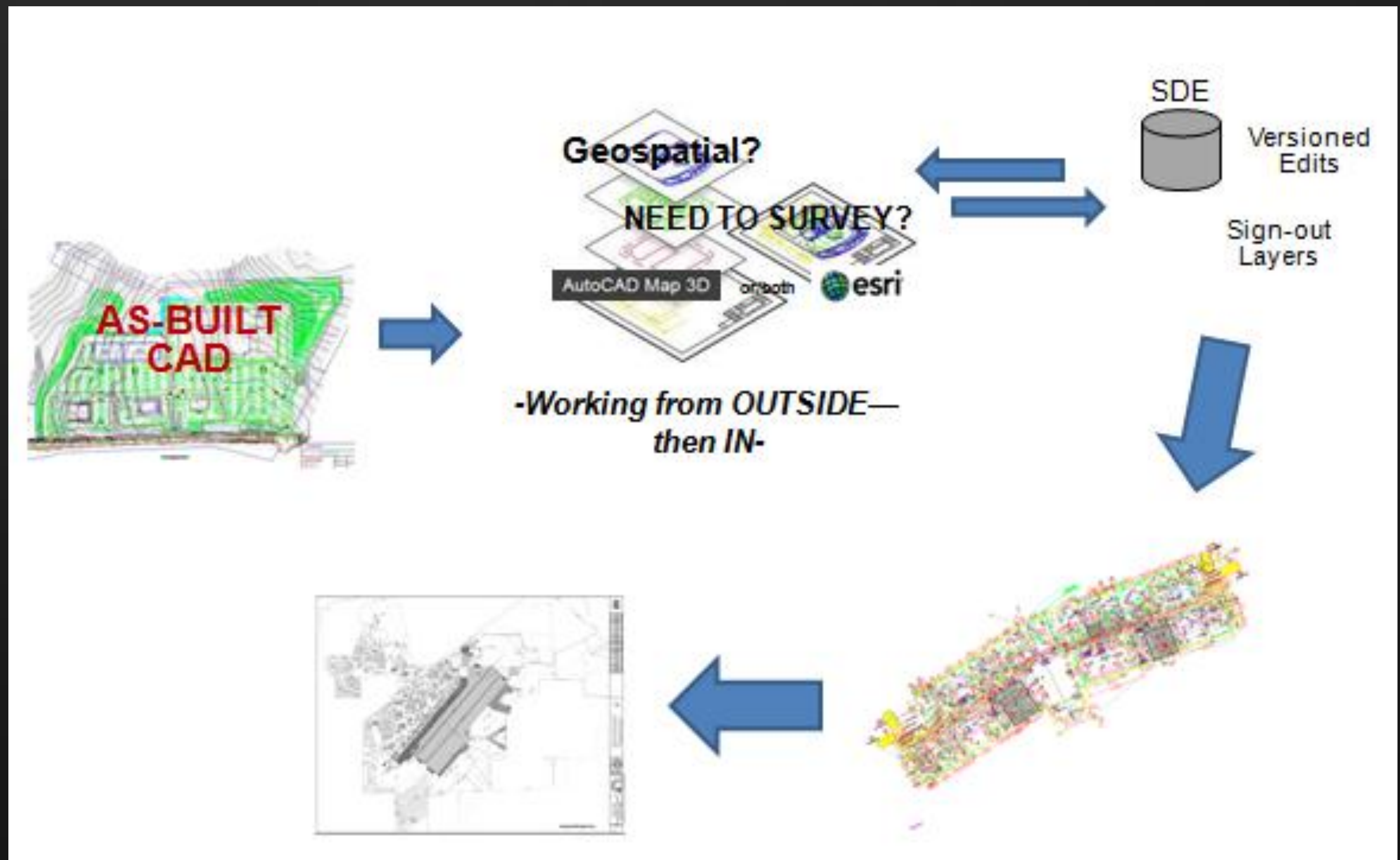


# Surveying (2 wks)



- All survey point data are kept in our GIS database

# CAD/GIS (1 wk)



# Results and Way Ahead

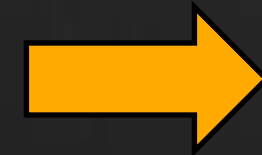


# Result

- Trained on core tasks
- Empowerment
  - ❖ Owning their work
- Teamwork
- Responsibility
- Knowing the use of equipment and software
- Getting the job done
- Possible certification



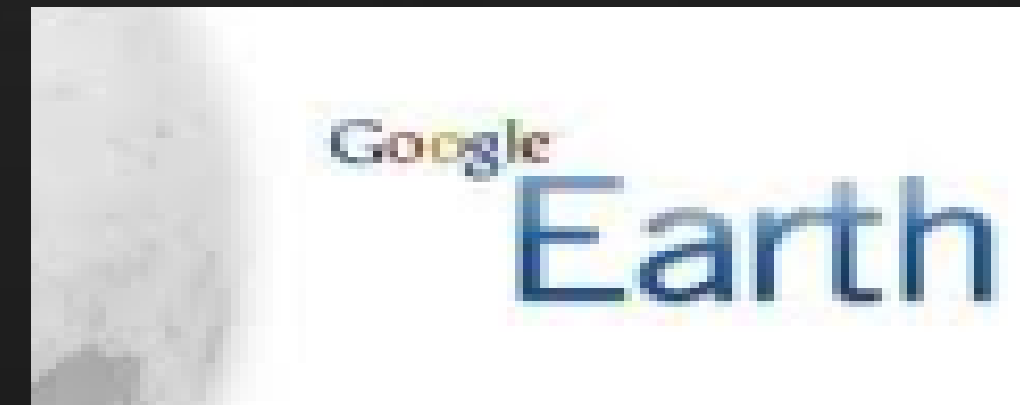
# Way Ahead



CIVIL 3D ©  
REVIT ©



NAVISWORKS ©



- \*Emergency Response
- \*Space Utilization
- \*Planning/ Construction/...
- \*Linear Segmentation
- \*BIM

# Questions?



# Thank you!