

Topics

- Connectivity of Geographic Data
- Sketch Maps
- Data Organization and Geodatabases
- Managing a Digitization Project
- Quality and Control
- Topology
- Metadata

Topics (continued)

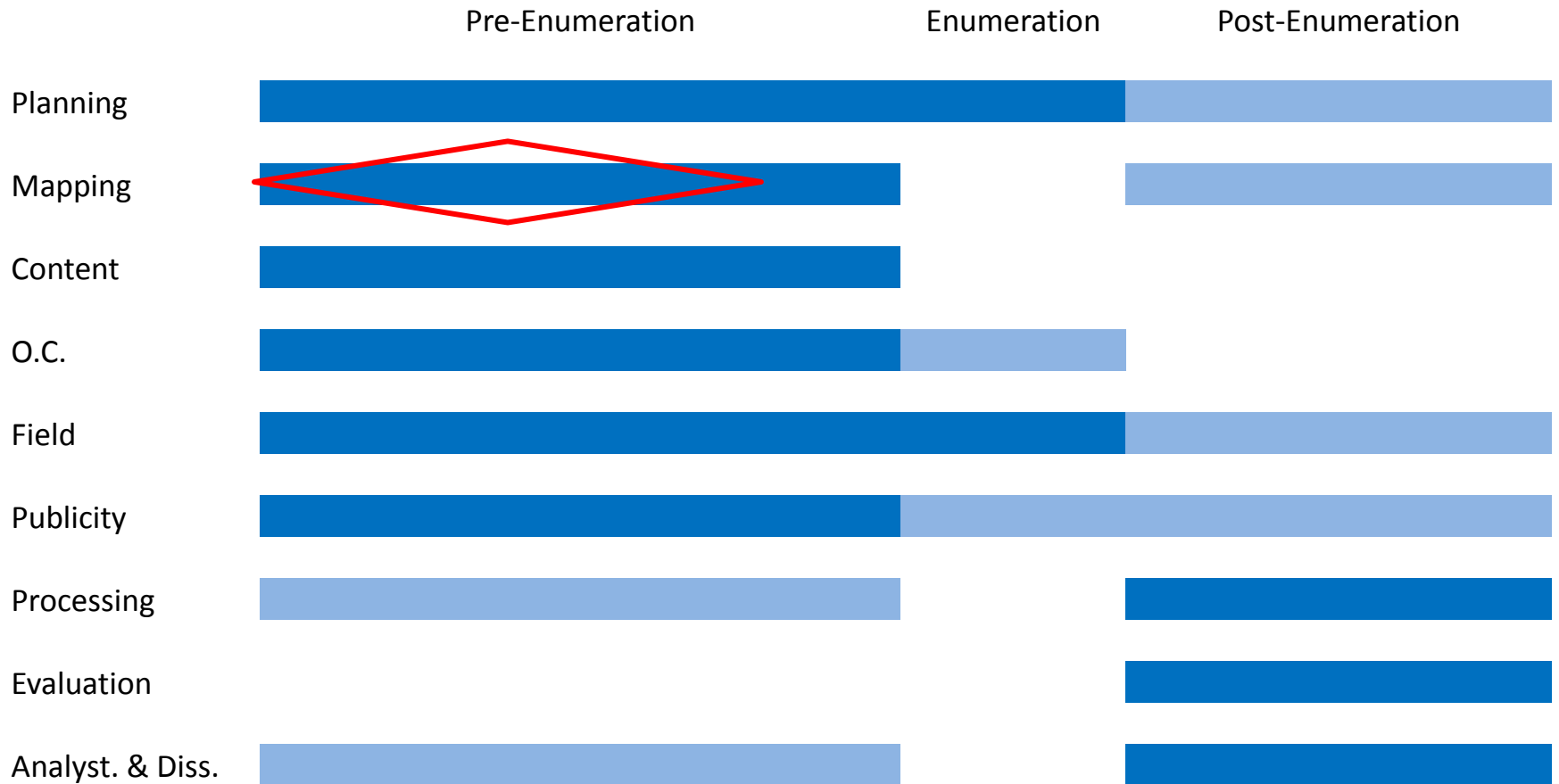
- Interactive Selection
- Snapping
- Advanced Editing Tools
- Rebuilding Geography after Edits
- Update and discuss outline of digitization manual
- Teaching presentations

Digitization in a Census

Steps of a Census

- Planning
- Mapping
- Questionnaire Content & Design
- Operational Control
- Field Operations
- Publicity
- Data Capture & Processing
- Evaluation
- Analysis & Dissemination

When do things happen?



No Credit for Effort

Digitization must be planned and executed relatively early in the census-taking process. If it is not completely done, digital statistical geography will not be used.

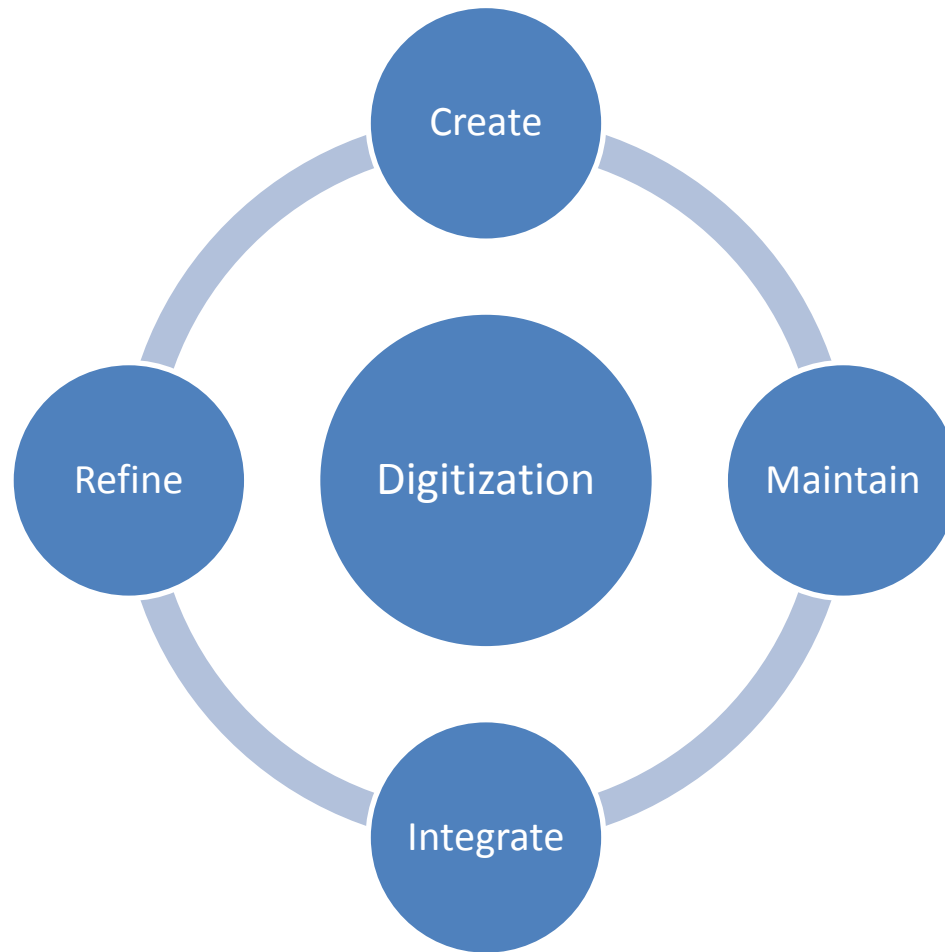
Digitization

- Digitization is a hard sell, but is the most important step towards modernized mapping for an NSO.
- Relatively long amount of time required, little payoff until complete.
- Little to no automation possible, difficult to get rest of statistical office “excited” about digitization.

As Trainers and Leaders

- May have to champion digitization of administrative and statistical geography.
- Explain the many subsequent geographic activities dependent on digitization.
- Emphasize digitization as an investment.

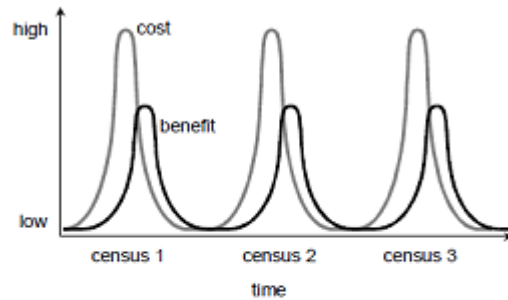
Digitization Cycle



Digitization Cycle

Figure II.1. Costs and benefits of census mapping options

(a) Traditional mapping approach



(b) Digital mapping approach

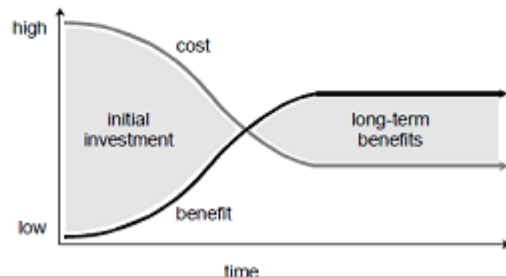


Image source: United Nations. Statistical Division. 2008. *Principles and recommendations for population and housing censuses*

- In the longer term a commitment to digitization will reduce costs.
- Reduces the amount work repeated each census cycle.
- Digitization skills form an important base for more advanced GIS.

Digitization Cycle

Create

Make an entirely new digital layer based on scanned sources or related digital layers.

- This is the most time consuming activity.
- Requires well-organized input data and a plan on how to use those data.

Digitization Cycle

Maintain

Make significant changes to line segments as part of an ongoing program to keep geography up-to-date.

- Ongoing changes necessary due to changes in geographical boundaries or population growth.
- Requires planning the frequency of updates and determination of authoritative data sources for updates to census boundary database.

Digitization Cycle

Integrate

Enforce correspondence between administrative and statistical geography.

- The hierarchy from nation down to enumeration block should be nested.
- Nested geography should correspond topologically. May require work to retroactively correct errors.

Digitization Cycle

Refine

Improve boundary sharing with other physical features. Create new generalization levels.

- Ongoing improvements to the appearance of cartographic products.
- Automated tools exist for generalization but cause topological errors that will require re-digitization of some features and clean-up.

Digitizers

Can range from geographers with academic credentials to draftsmen to other functional specialists brought in from different parts of organization.

- The quality of training and a comprehensive plan will determine success of digitization project.
- Training must teach participants technical skills (button-pushing) as well as problem solving.

Work Units

- Similar in concept to an enumeration area. The spatial extent that one person can be expected to digitize in a standard time period, such as a day or week.
- Work units can be combined as needed to organize projects, but the base unit must be the responsibility of one person.

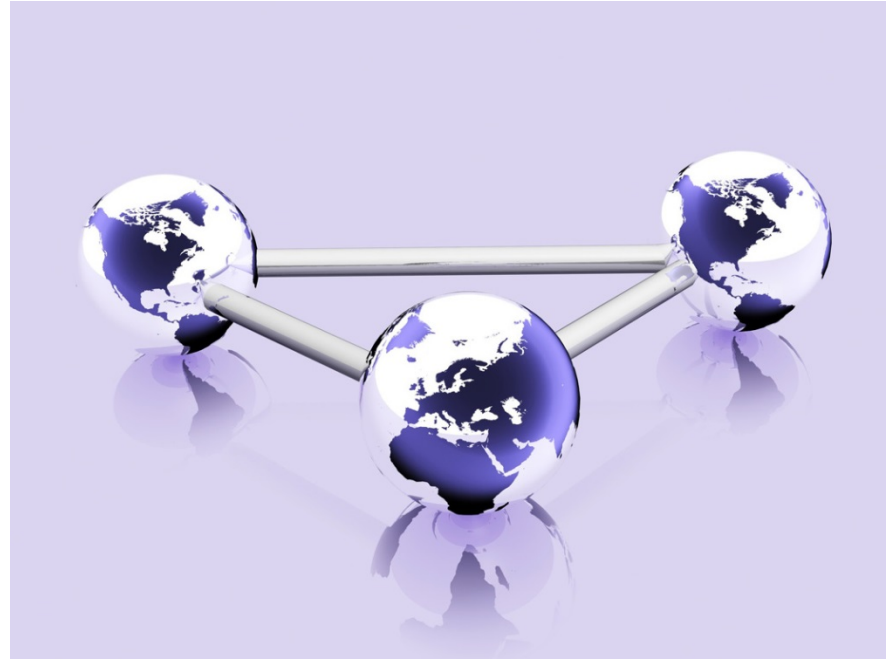
Work Units

- Why are work units important?
 - They facilitate clear responsibilities.
 - They allow for more precise measurement of progress made.
 - More importantly, work units reduce errors based on overlapping digitization that will then require correction when working with topology.

Geographic Data

What Makes Data Geographic?

- Is it location?
Yes, but why?
- Connectivity!
- What does location allow us to do? Connect data based on space.



Geographic Data Connectivity

- Anything that has a location can be displayed and may be useful when digitizing.
- However, this does not mean that every dataset will be useful when digitizing.
- Consider:
 - Relative position of features
 - Interpretability of shape and size at scale

Base or Precursor Datasets

- Which precursor datasets are necessary or useful when digitizing collection geography?
 - Streets
 - Drainage
 - Parcels
 - Village extents
 - Incorporated or developed areas
 - Landcover
 - Elevation



Use Scenarios

- Consider the list of datasets shown on the previous slide.
- How can you expect to be able to use a vector based data source, such a road network, and a raster dataset such as SRTM?

Data Sources

Source:	Global Landcover Facility	Shuttle Radar Topography Mission (SRTM)	UN Second Level Administrative Boundaries Working Group
<u>Who?</u>	Remote sensing center. Access to land cover products and imagery for local to global areas affiliated with the University of Maryland.	NASA elevation data on a near-global scale to generate the most complete high-resolution digital topographic database of Earth.	Part of the larger Geographic Information Working Group at the United Nations.
<u>What?</u>	An archive of medium and low resolution imagery that may be useful in rural areas. Landcover can also be used to roughly delineate urban.	Provides a digital elevation model (DEM) that can be used to identify topographic features suitable for collection geography digitization.	Can provide boundaries for neighboring countries for use in cartographic products.

Data Sources

- Other data sources?
- What are some sources specific to the Union or state governments?
- What types of data are most lacking for the work you do now?

Other Agencies

- Establishing relationships with other agencies is often key to a successful digitization project.
- Determine needs early and set out to meet them.
- Early contact with an agency will reduce pressure.

Sketch Maps

Sketch Maps

Sketch maps can be:

- A hand-drawn representation of an enumeration block
- Made by someone with little or no cartographic training
- Usually not to scale and does not correspond with any digitized features

Sketch Maps

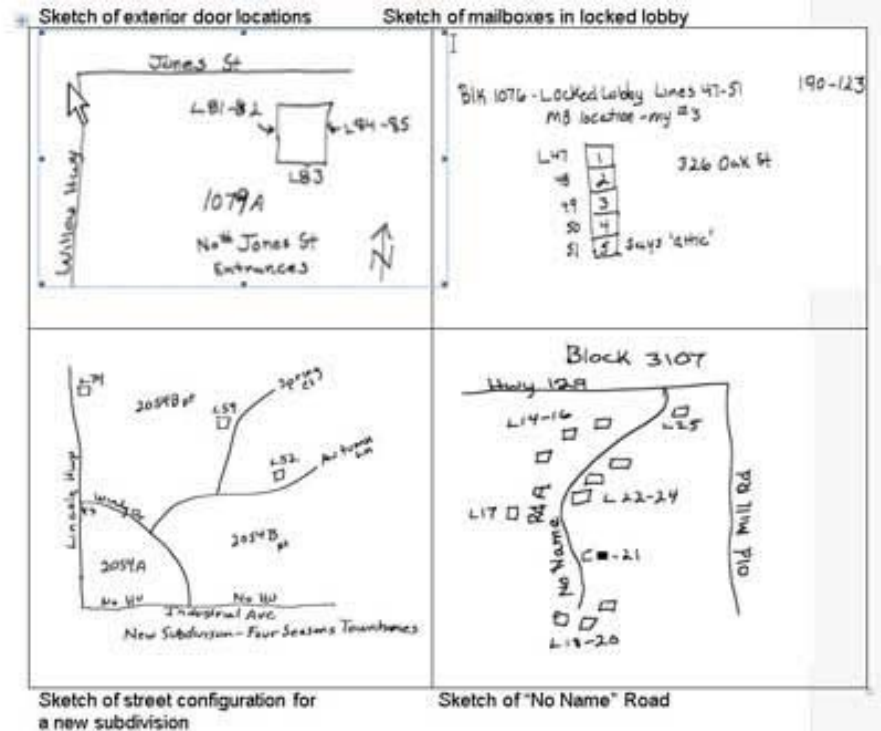
Unfortunately, they are often...

**THE ONLY FIELD
VERIFIED SOURCE
YOU HAVE**



Interpreting Sketch Maps

- Strategies for making do with sketch maps:
 - Analysts can often interpret hand drawn roads using a digital file
 - Roads are the best option for developing a link between paper and digital data
 - Any other layers are likely only able to be used with considerable difficulty



Digitization or Freehand?

- Even well-trained cartographic technicians require specifications that guide their work and reduce confusion.
- What if a sketch map is not interpretable?
- Under which circumstances is freehand digitization permissible?