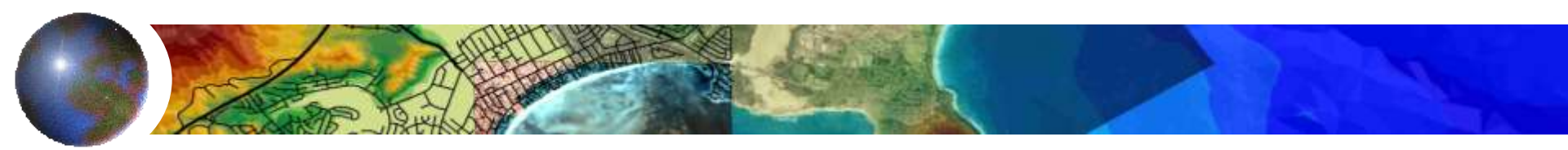
# *GIS Data Capture:*
## *Getting the Map into the Computer*

# *Overview*

- Introduction
- Primary data capture
- Secondary data capture
- Data transfer
- Capturing attribute data
- Managing a data capture project
- Error and accuracy



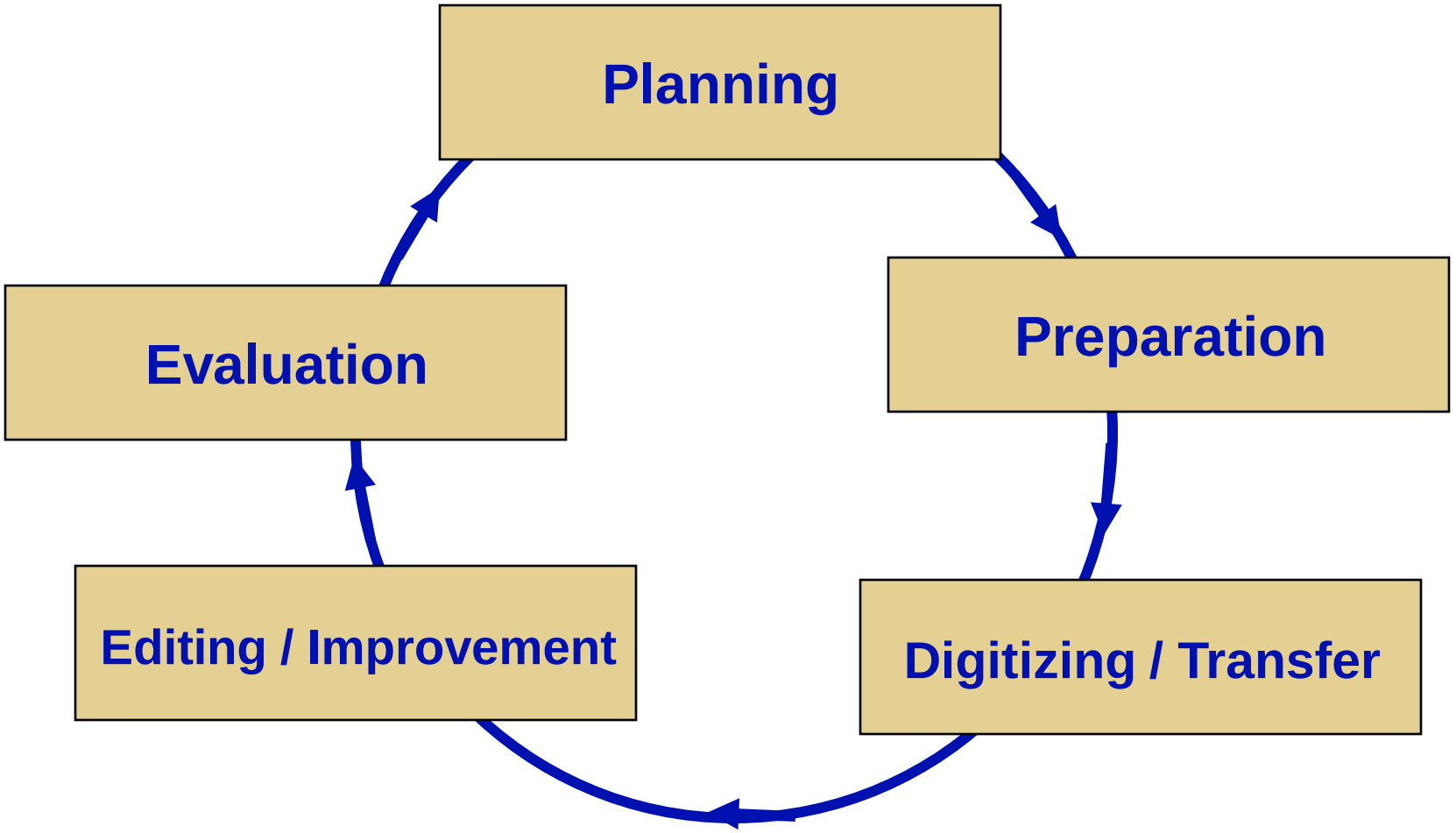
# *Data Collection*

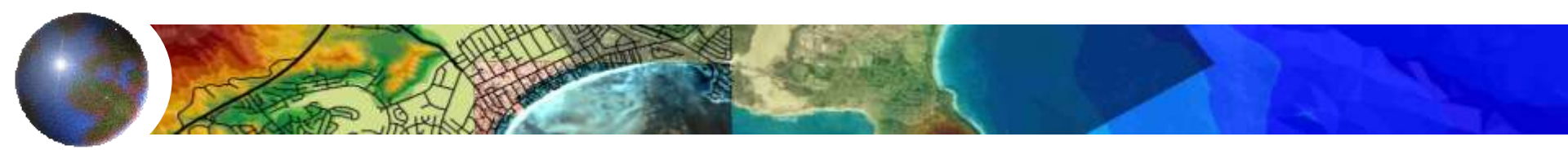
- One of most expensive GIS activities
- Many diverse sources
- Two broad types of collection
  - Data capture (direct collection)
  - Data transfer
- Two broad capture methods
  - Primary (direct measurement)
  - Secondary (indirect derivation)

# *Data Collection Techniques*

| | Field/Raster | Object/Vector |
|---|---|---|
| Primary | Digital remote sensing images | GPS measurements |
| | Digital aerial photographs | Survey measurements |
| Secondary | Scanned maps | Topographic surveys |
| | | |

# *Stages in Data Collection Projects*





# *Primary Data Capture*

- Capture specifically for GIS use
- Raster – remote sensing
  - e.g. SPOT and IKONOS satellites and aerial photography
  - Passive and active sensors
- Resolution is key consideration
  - Spatial
  - Temporal

# *Vector Primary Data Capture*

- Surveying
  - Locations of objects determines by angle and distance measurements from known locations
  - Uses expensive field equipment and crews
  - Most accurate method for large scale, small areas
- GPS
  - Collection of satellites used to fix locations on Earth's surface
  - Differential GPS used to improve accuracy

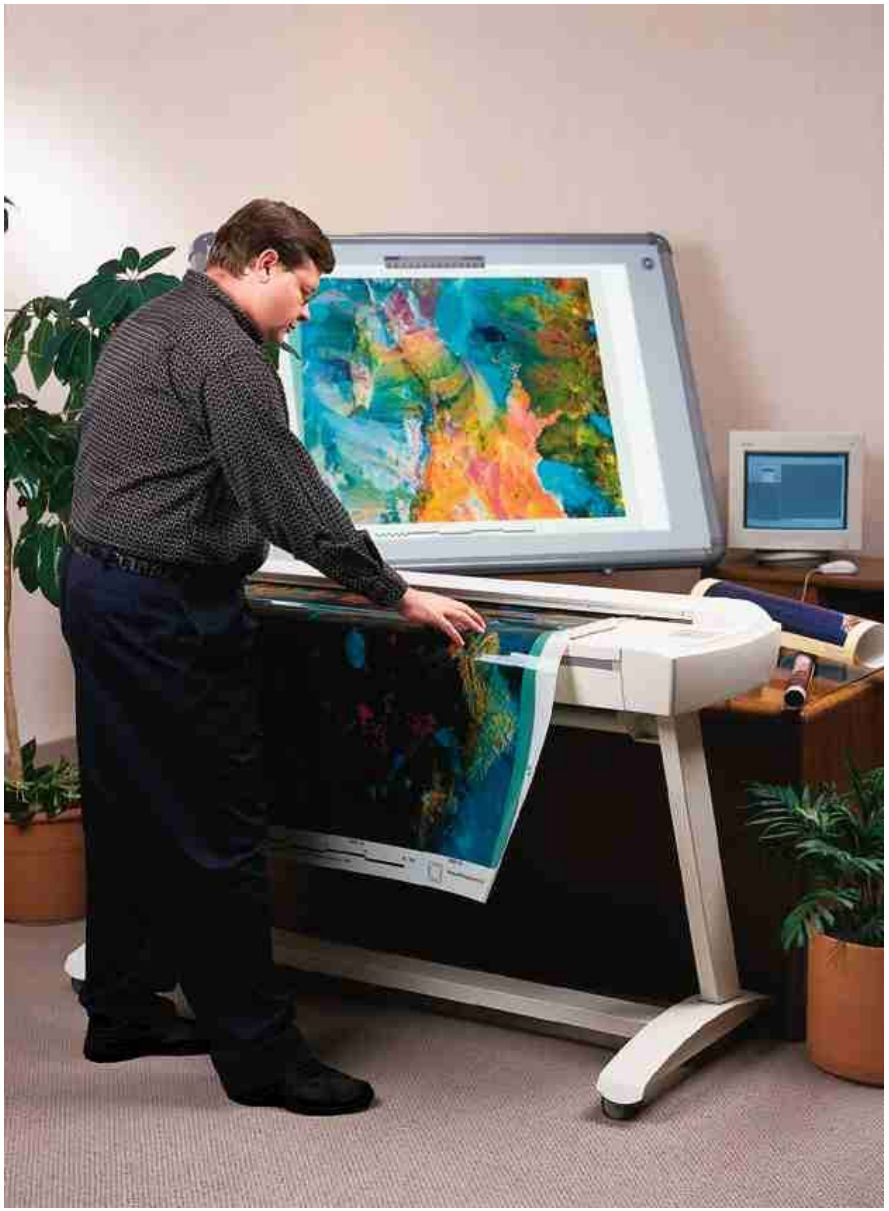
# *Total Station*


# *Pen Portable PC and GPS*

# *Secondary Geographic Data Capture*

- Data collected for other purposes can be converted for use in GIS
- Raster conversion
  - Scanning of maps, aerial photographs, documents, etc
  - Important scanning parameters are spatial and spectral (bit depth) resolution

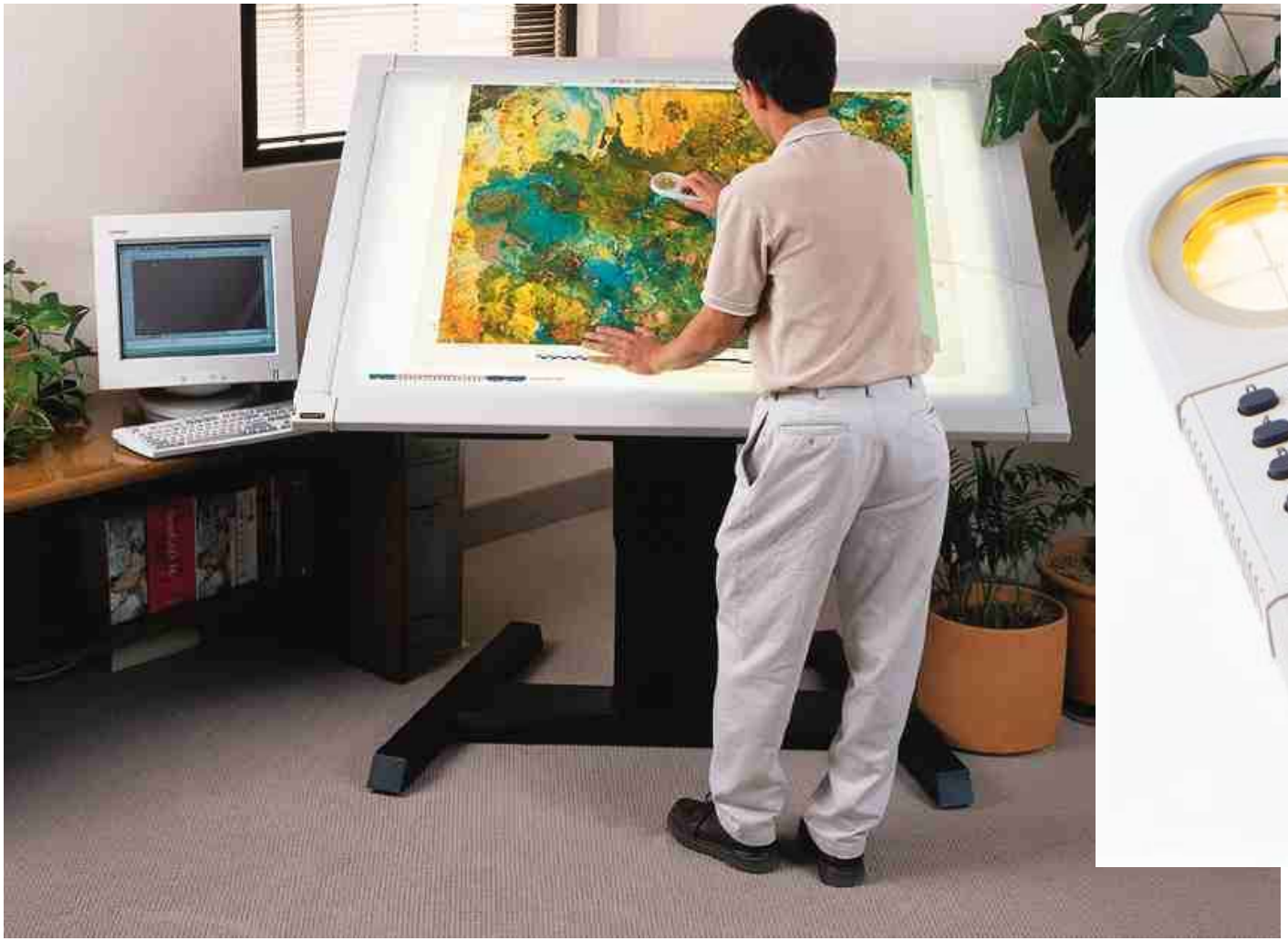
# *Scanner*



# *Vector Secondary Data Capture*

- Collection of vector objects from maps, photographs, plans, etc.
- Digitizing
  - Manual (table)
  - Heads-up and vectorization
- Photogrammetry – the science and technology of making measurements from photographs, etc.

# *Digitizer*



# *Data Transfer*

Buy vs. build is an important question

- Many widely distributed sources of GI
- Clearing Houses
- Available Digital Data

# *Price Factors of Digital Data*

- Nature of Data
  - Topographic Base Data is easier to obtain than Elevation Data, which in turn easier to get than Natural Resource or Census Data
- Scale of Data
  - Obtaining Large Scale Data is more problematic than Small Scale
- Date of Production
  - Recent Data is more difficult to obtain than older data.

# *Managing Data Capture Projects*

- Key principles
  - Clear plan, adequate resources, appropriate funding, and sufficient time
- Fundamental tradeoff between
  - Quality, speed and price
- Two strategies
  - Incremental
  - 'Blitzkrieg' (all at once)
- Alternative resource options
  - In house
  - Specialist external agency

# *The Role of Error*

- Map and attribute data errors are the data producer's responsibility,
  - GIS user must understand error.
- Accuracy and precision of map and attribute data in a GIS affect all other operations, especially when maps are compared across scales.

# *Components of Data Quality*

- positional accuracy
- attribute accuracy
- logical consistency
- completeness
- lineage