Geographic Information System (GIS)

What does it mean to you?
Typical Information Systems (TIS)

Many of us use Typical Information Systems (TIS) to interact with data

With TIS we interact with data through

- Reports
- Spread Sheets
- Computer Forms and Screens
- Etc.

Typical Spreadsheet

| V656223HS | EXP PIN | JFIN | B12 280 5870 | A |
| D5701694DI | DOLGEN | WALOK | CAS 421 | N |
| V0605104HS | CARCOR | MAILMA | 781-322 8800 | 196 PCS 200 A |
| D5701999DI | DOLGEN | LGVOK | CAS 513 | A |
| D5701999DI | DOLGEN | ABITX | CAS 981 | N |
| D5701999DI | DOLGEN | ABITX | CAS 425 | N |
| D5701996DJO | DOLGEN | ABITX | CAS 819 | A |

Typical Report

Typical Form
Geographical Information System (GIS)

GIS extends the Typical Information System (TIS) ....

- GIS Transforms TIS data into Layers
- Layers are
  - Graphical
  - Spatial
  - Intuitive
- Layers are used in
  - Paper Maps
  - GIS applications E.G.
    - Internet
      - MapQuest
      - Google Maps
    - Nightly News
      - Weather Reports
      - Voting Polls
- Layers convey something technical in one visual statement
Have you ever heard people say “A picture is worth a thousand words.” or “Paint me a picture.” This applies to data too. The GIS transforms TIS data tables into graphical pictures, called Layers. Stacked Layers form maps. Most Layers are classified as imagery, point, line or polygon.

- Vehicles
- Stores
- Customers
- Roads
- Cities
- Lakes
- States
- Countries
Imagery layers serve as background for many maps.
The way a layer looks is called “style”

- Some attributes of the point style are
  - Size
  - Color
  - Symbol
    - Circle
    - Triangle
    - Image
    - Fonts
  - Label

- Styles are determined by data values
  - 1 = green
  - 2 = red
  - 3 = blue

- Labels are data values

With “Style” Point Layers convey much more than just location and proximity.
Line Layers commonly represent roads, rivers, borders, routes and networks. Line styles convey volume, direction, classifications etc.

- **Line Style Attributes**
  - Color
  - Thickness
  - Arrows

- **Conveys**
  - Volumes
  - Flows
  - Classes
  - Networks
Polygon styles commonly use transparency or hash patterns so other Layers may show through.

- Red
  - High
- Yellow
  - Medium
- Cyan (blue)
  - Low
GIS Layers – Analysis

- Point Business Layer shows employee residences
- Polygon distance rings Layer shows proximity to the site
  - Polygon borders are colored
  - Polygon area is transparent
  - 5 Mile Intervals
- From this we can determine
  - How far away most of the employees live from the office
  - Which Direction they travel to get to work
  - Where employees are concentrated
  - Where individual employees live

When shown together, Layers provide for analysis of data. For example, here is point and a polygon layer working together to show proximity to a site.
Layers - Static Maps

Layers work as well for static maps as they do for Layer Viewers.

- **Paper**
  - 8.5 X 11 Maps
    - Color Laser Printer
  - Wall Maps
    - Plotter

- **Electronic**
  - .PDF
  - .JPG
  - .EPS
To use Layers in a secure Intranet environment, we may use a GIS Layer Viewer. GIS Layer Viewers are intuitive so people can use layers quickly without training and expensive software. Almost every GIS Layer Viewer has a Toolbar, Layer List and Map Frame.

- **Toolbar tools** zoom-in, zoom-out etc.
- **Layer List** describes Layers and controls Layer visibility
- **Map Frame** displays layers
Many free GIS Viewers are available. Some of them, such as ESRI ArcGIS explorer and Google Earth can integrate with local GIS Data Stores.
Custom GIS Applications

We can customize and extend GIS Layer Viewers to suit advanced applications such as mobile asset management and tracking. For example, this is a customized GIS Layer Viewer used to track and manage thousands of mobile assets. With GIS applications we can perform many functions such as search and show associated data in a frame.

- **Query/Legend**
  - Find Vehicles
  - Filter

- **Map**
  - Zoom
  - Pan
  - Load Status
    - Loaded
    - Committed
    - Empty
  - Division

- **Data**
  - Driver
  - Tractor
  - Trailer
  - Trip
Enterprise GIS