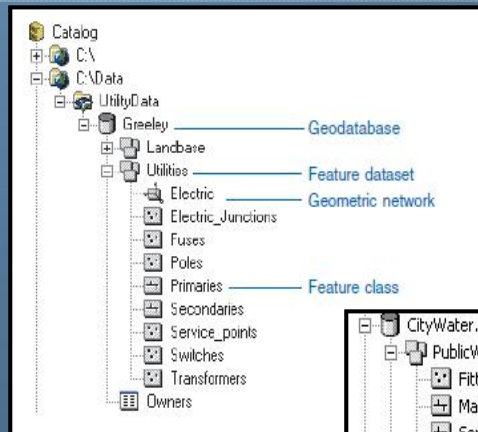
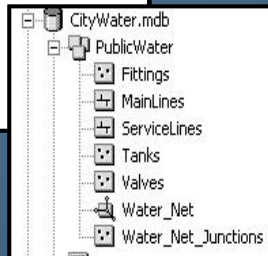


## What is a geometric network in ArcGIS?

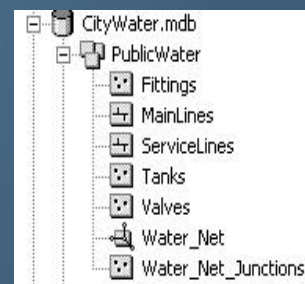


- Geometric networks are created in ArcCatalog and stored as a **relationship class** within a geodatabase feature dataset.



## Geometric Network and Logical Network

- A geometric network has a corresponding logical network.
- The logical network is the physical representation of the network connectivity.
- Can be visualized as a set of tables without geometry – associated with features in the network.



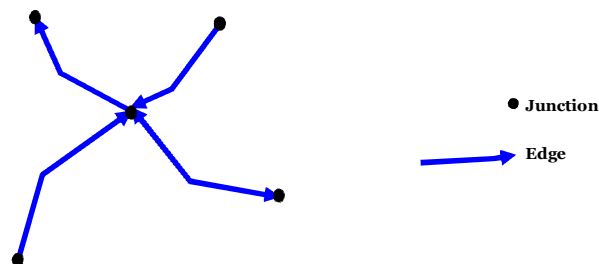
## What are Geometric Networks made of?

- A geometric network uses feature classes
  - The network is composed of connected **Edges and Junctions** – based on geometric coincidence of feature classes
  - **Connectivity Rules** – define behavior of network features, used to represent and model the behavior of a common network infrastructure in the real world.

## Edges and Junctions

- **Edges** are network features similar to simple line features.
  - Line Feature Class : water mains, electrical transmission lines, gas pipelines, telephone lines, etc...
- **Junctions** - facilitates the transfer of flow between edges, similar to pt features
  - Point Feature Class: fuses, switches, service taps, valves, etc...
- **Topologically** connected to each other:
  - Edges must connect to other edges at junctions

## Edges and Junctions

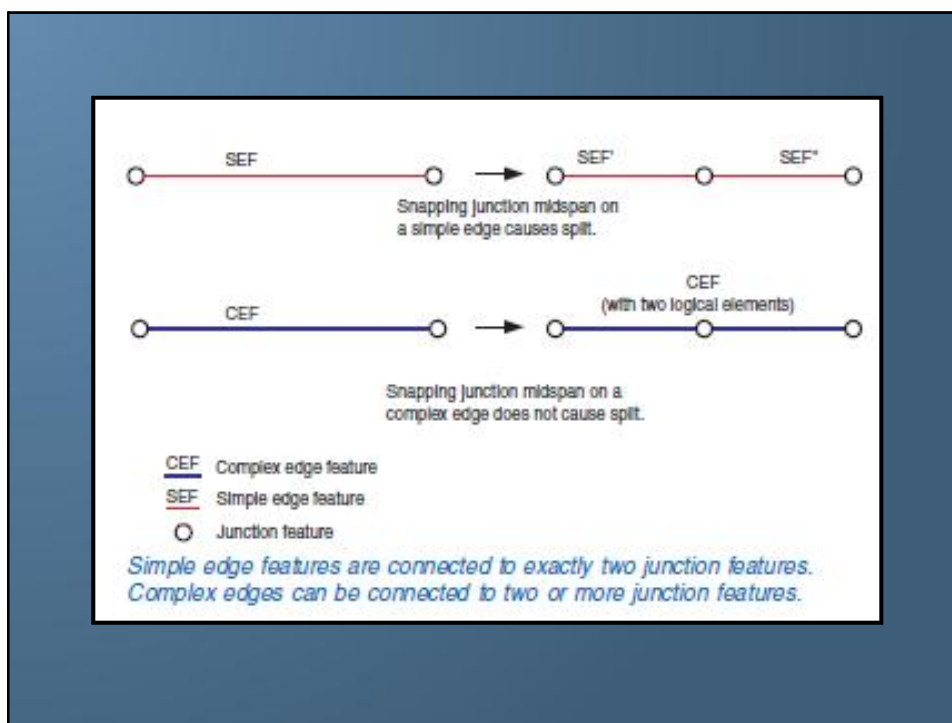


## Types of Edges

- **Simple Edges** - Edges end with junctions and junctions connect edges
- **Complex Edges** - Complex edge features are created by connecting features to an edge without splitting them at junctions

## Types of Junctions

- **User defined junctions** - Created based on point feature classes, correspond to a single junction element in the logical network.
- **Orphan junctions** - Will be inserted at the endpoint of any edge at which a junction does not already exist, maintains network integrity

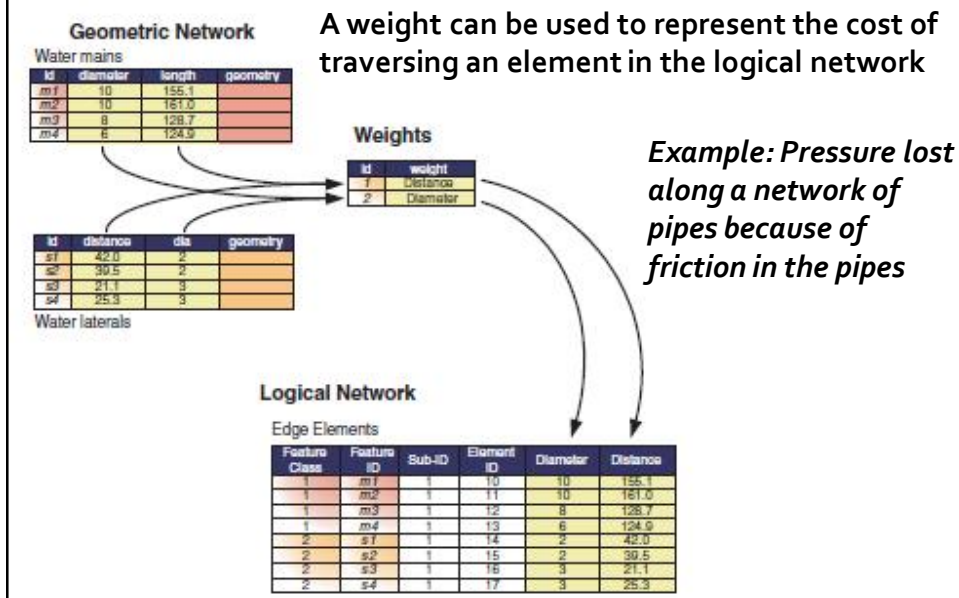


## Sources and Sinks

- Flow moves from Sources ➡ Sinks in the Geometric Network
  - **Junction features:** AncillaryRole Field is added to the feature class = source, sink, or neither a source nor a sink.
- This can be used to map flow in ArcGIS
- Useful to map changes in flow when Junctions are altered (Disabled/Enabled)



## Network Weights



## Creating Geometric Networks

### Creating a new, empty network

- In ArcCatalog you can create, design, and build a geometric network from scratch.

### Building a geometric network from existing data

- ArcCatalog contains a wizard that creates a geometric network from existing data.
- When creating a geometric network feature classes may need to be snapped together to create connectivity.
  - Similar to the Cracking and Clustering in Topology

## Managing a geometric network

- More complicated than managing a single entity, such as a table, shapefile, or feature class
- A geometric network is an association among several feature classes and is represented by several tables in the database –
  - Manipulating the network involves all of these components
- ArcCatalog can be used to Delete or Copy the Geometric Network

## Questions!

1. What is a Geometric Network?
2. What is a Logical Network?
3. Where and how are Geometric Networks stored in a Geodatabase?
4. What is the purpose of setting sources and sinks in a Geometric Network?

## References

**ArcGIS Desktop Help 9.2: Geometric Networks**

[http://webhelp.esri.com/arcgisdesktop/9.2/index.cfm?TopicName=Managing\\_a\\_geometric\\_network](http://webhelp.esri.com/arcgisdesktop/9.2/index.cfm?TopicName=Managing_a_geometric_network)

**ESRI Building Geodatabases, Chapter 7: Geometric Networks**

<I:\Students\Data\GIS\ArcGIS Documentation\ArcGIS9.1 documentation\ESRI Library>

