

# Why Graphs?

## Example 2: Biology



# Cities have Networks

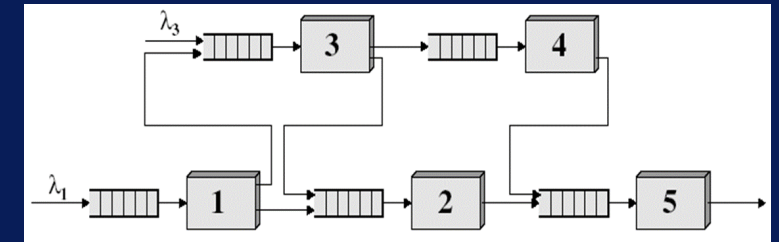
- **Multiple interacting networks over the same spatial domain**

- Transportation networks
  - Multiple modalities
- Water and sewage network
- Power transmission network
- Broadband IP and M2M networks



# Networks Should be Modeled

- **Multiple functionalities of each network**
  - Physical infrastructure
  - Commodity flow
    - Material
    - Energy
    - People
- **Need to create “network models”**
  - Analytical traffic model
    - Congestion models





# Why Graphs?

- Planning for “smart hubs”
- Estimating congestion patterns
- Demand Response Analyses
- Energy-optimal routing

