
Progress Report: The Health Geodatabase Model

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ESRI's specialized data models

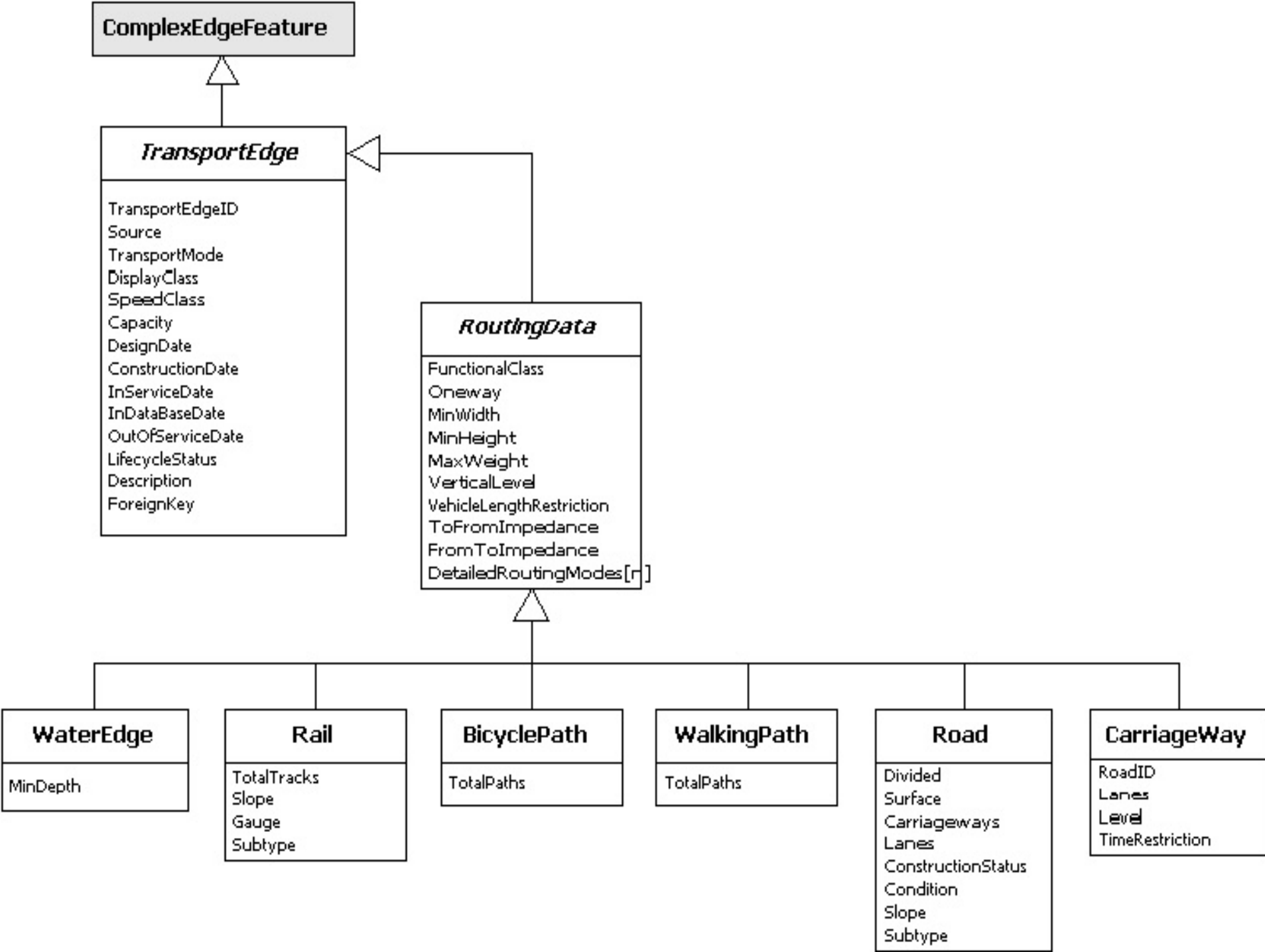
- "The goal for each ArcGIS data model is to provide practical templates for implementing GIS projects for specific industries and applications. Designed by a consortium of users and business partners, these models provide ready-to-use frameworks, built on accepted standards, for modeling and capturing the behavior of real-world objects in a geodatabase."

Existing data models

- Address
- Basemap
- Biodiversity
- Census-Administrative Boundaries
- Defense-Intel
- Energy Utilities
- Environmental Regulated Facilities
- Forestry
- Geology
- Historic Preservation and Archaeology
- Hydro
- Land Parcels
- Local Government
- Marine
- Petroleum
- Pipeline
- Telecommunications
- Transportation
- Water Utilities

What does a data model do?

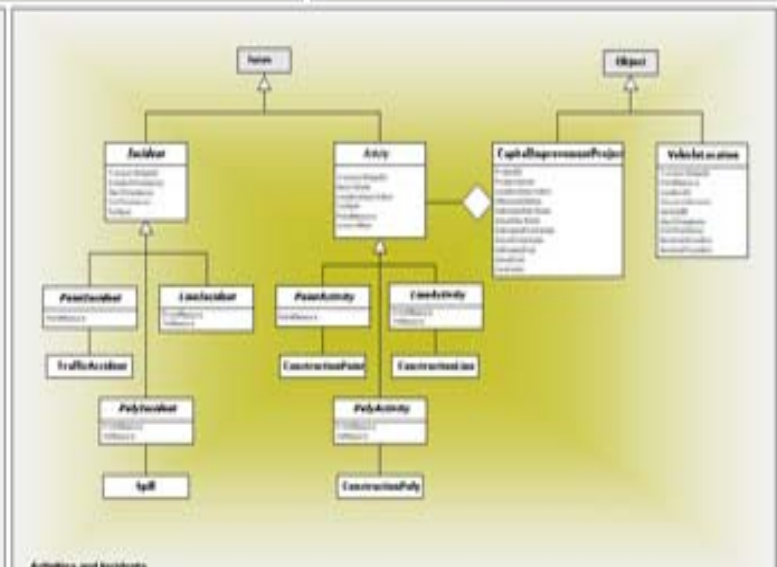
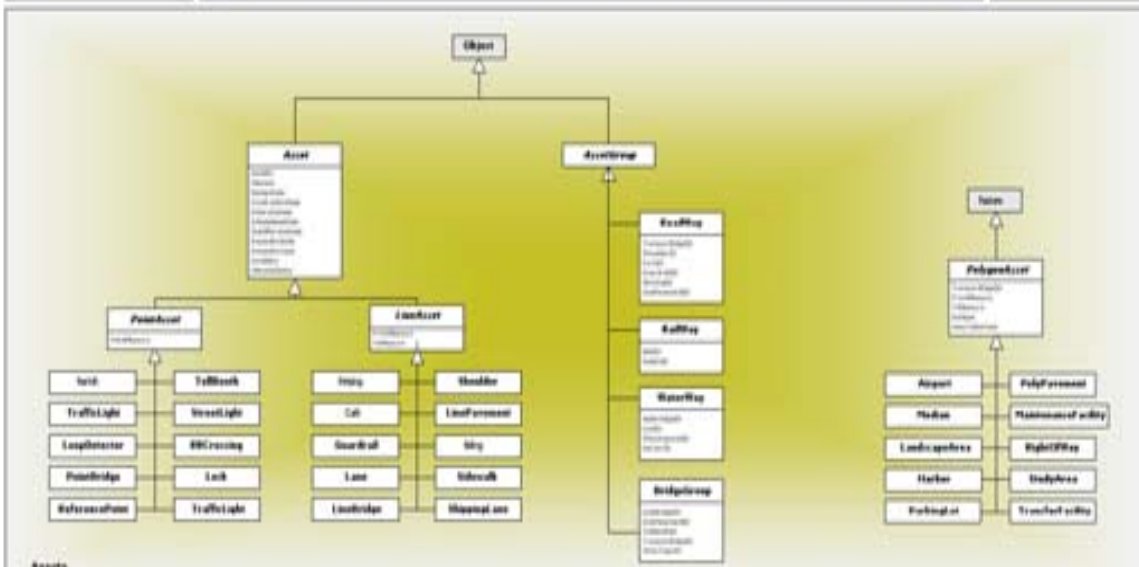
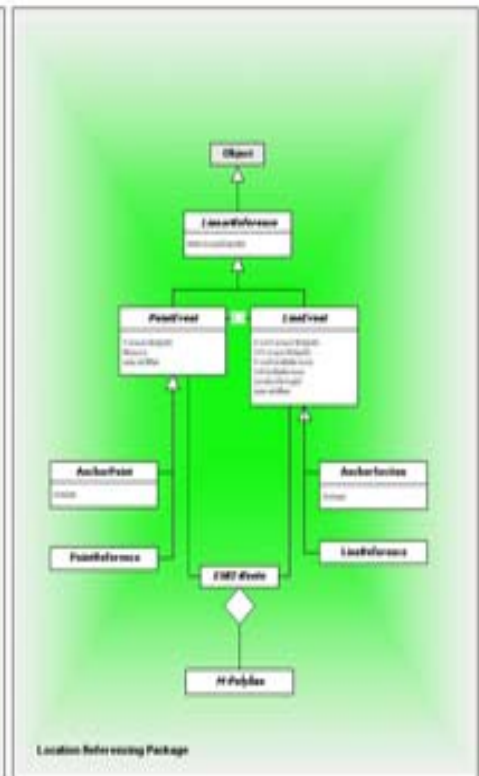
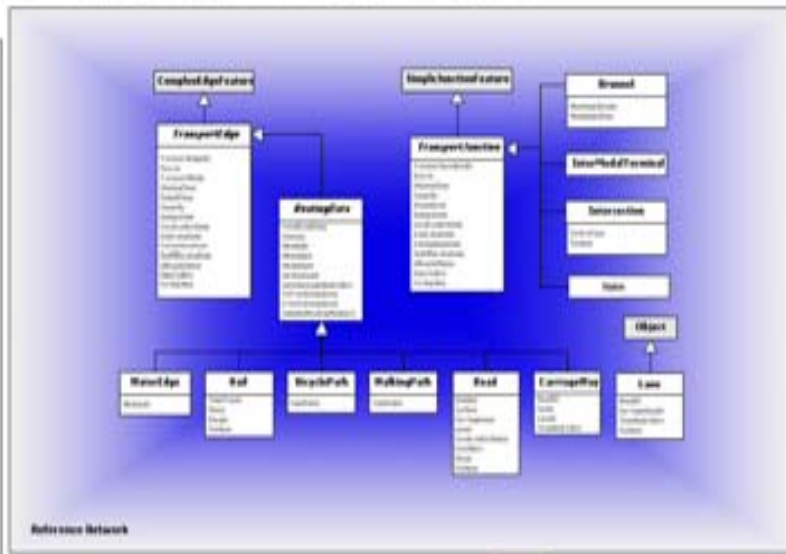
- ESRI ArcGIS data objects
 - point, polyline, polygon
 - edge, junction
 - defined attributes: shape, area, length
- Specialized in an application
 - point -> health facility site
 - polygon -> health statistics reporting zone
 - additional attributes for the application
 - methods associated with the objects
 - associations with other objects



ArcGIS Transportation Data Model

Feb. 21, 2001

How to read this diagram



Objectives for the health data model

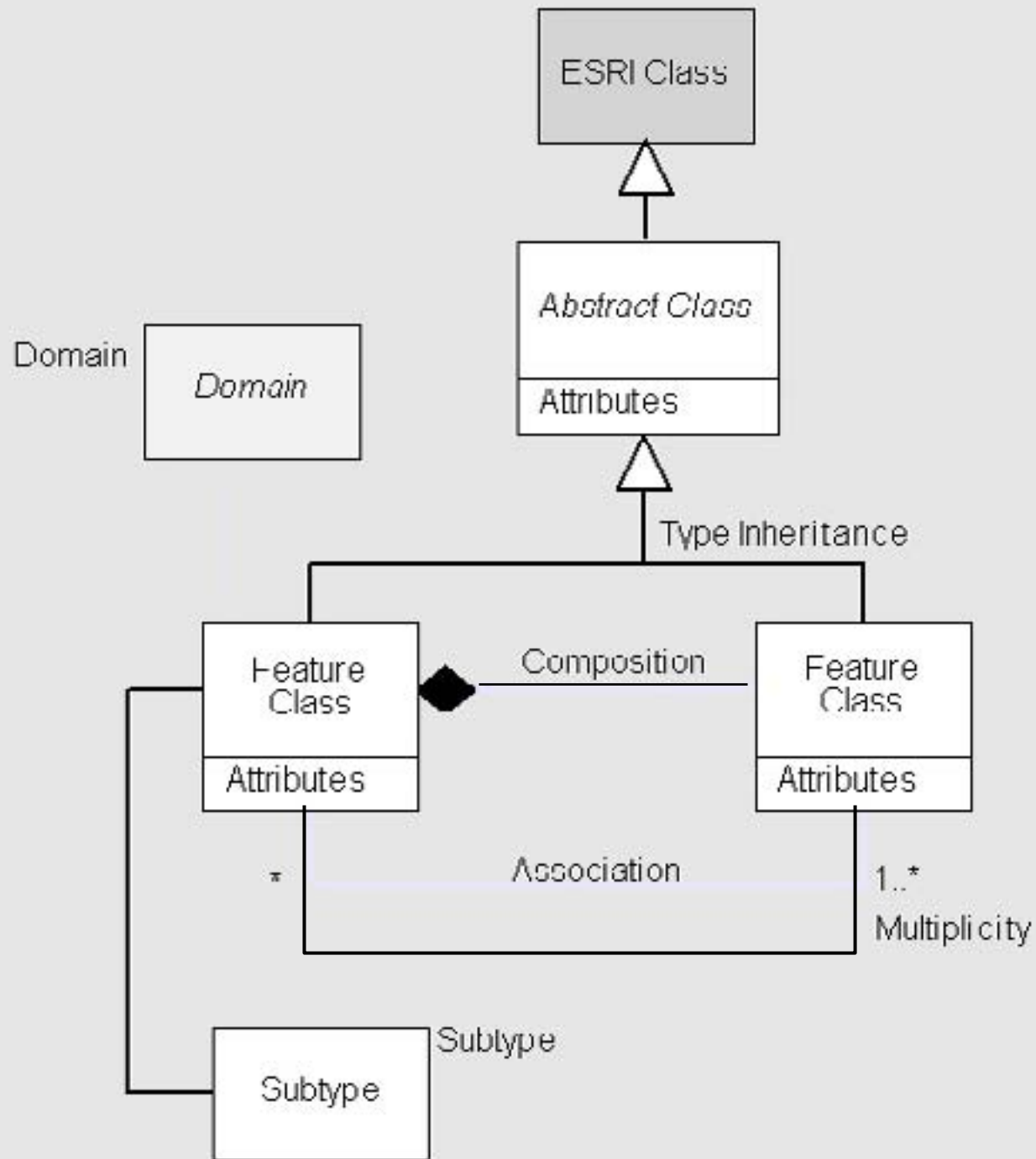
- Plug and play
 - facilitating use and application development
 - easily extended
- Publicizing applications
 - and illustrating benefits
- Standards for exchange
 - towards semantic interoperability
- Adding the spatial dimension
 - to general-purpose health data models
 - identifying gaps in other data models

Evolving trends in GIS software

- The georelational model
 - related tables
- Object-oriented modeling
 - objects as instances of general classes
 - classes as specializations of more general classes (inheritance)
 - methods associated with classes (encapsulation)
 - associations between objects

Unified Modeling Language

- Visual representation of a data model
 - conventional symbols
 - implemented in Visio
- Creation of database layout
 - using CASE tools
 - building tables
 - populate tables with data



1. Health service site selection

- Environmental assessment
- Roads, transportation
- Demographics: payors and patients
- Utilities
- Existing facilities
- Geography of medical costs
- Health service demand and utilization
- Health workforce
- Catchment areas
- Actuarial data

2. Regional emergency response

- Staff locations, expertise, availability
- Available facilities
- Emergency response locations
- Triage areas
- Blood resource locations
- Daytime, night-time population
- Transportation

3. Facility emergency response

- Daycare of staff children
- Alternative facilities
- Transportation
- Evacuation routes

4. Health campus facility management

- Buildings
- Utilities
- Evacuation routes
- Floor plans
- Space utilization

5. Regional environmental health

- Groundwater, wells
- Soils, topography
- Land use, land cover
- Pesticide use
- Storage of chemicals
- Electromagnetic fields
- Clinical outcomes
- Residential histories
- Demographics
- Land parcels
- Transportation
- Sick buildings
- Radon mapping

6. Disease surveillance

- Land use, land cover
- Tracking of individuals
- Pharmacies, schools
- Demographics
- Individuals: immunization
- Food, water supplies
- Meeting places
- Health facilities
- Transportation: airports, flights
- Weather

Related standards and models

- Automated Licensing Information and Report Tracking System (ALIRTS)
- Health Level Seven, Inc. (HL7)
- HL7 Reference Information Model (RIM)
- Leadership Development Mechanism (LDM)
- Conceptual Health Data Model v2.3 (Canada)
- National Health Information Model (Australia)
- Center for Disease Control (Data Models and Code Sets)
- International Classification of External Causes of Injuries (ICECI)
- Federal Geographic Data Committee (FGDC) Address Content Standard

Big-picture issues

- Not a corporate data model for a unified agency
 - the field is too diverse, too vast
- Scale of data model integration
 - is this the right scale?
 - do we need a repository of data models?
- US or international?
- Relationship to other data models and standards
 - foreign keys?

The process

- First stakeholder meeting, Santa Barbara April 7-8
- This conference
- The web site
 - www.ncgia.ucsb.edu/projects/health
- ESRI 2003 User Conference July 7-11
 - possible half day meeting
 - possible lunch
 - watch the web site
- Subsequent stakeholder workshops, presentations

What can you do to help?

- Ideas, comments, suggestions
 - other application areas
 - other data models, standards
- Examples
 - applications of the data model
 - data sets
- We need all the help we can get
- Watch this space!