

# **MetroGIS**

## **Business Object Modeling for the Fragment:**

### **“Jurisdictional Boundaries”**

Final Turn Around Document  
July 3, 1997

June 2, 1997  
St. Paul, Minnesota

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## Participants List

### Subject Matter Experts:

<b>ID</b>	<b>Name</b>	<b>Organization/Agency</b>	<b>Function</b>
SH	Steve Hoiium	City of Minneapolis	Graphic Analyst
PL	Paul Leegard	Anoka County	GIS Coordinator
MK	Mark Kotz	Metropolitan Council	GIS Specialist
MM	Michael Munson	Metropolitan Council	Researcher
JK	Jay Krafthefer	Washington County	GIS Manager
JH	Jane Harper	Washington County	Physical Development Planner
SH	Scott Hovett	Washington County	County Assessor
JS	Jeff Sahalt	MN Dept. of Transportation	Cartographic Unit
PR	Peggy Ryan	Washington County	Surveyor's Office
MB	Marcia Broman	Metro 911 Board	Director, 911
RC	Roger Carlson	City of Minneapolis	County Assessor
WC	Will Craig	Univ. of MN, CURA	Assistant Director
SR	Steve Russell	City of Stillwater	Community Development Director

### Support Team:

<b>ID</b>	<b>Name</b>	<b>Role</b>	<b>Organization/Agency</b>
SC	Steve Clowse	Facilitator	Advanced Strategies
CC	Chris Cialek	Coach/Facilitator	LMIC
SM	Susanne Maeder	Recording Analyst	LMIC
NR	Nancy Rader	Recording Analyst	LMIC
RJ	Randy Johnson	Project Manager	Metropolitan Council
DV	Rick Gelbmann	Observer	Metropolitan Council
HW	Heidi Welsch	Staff Support	Metropolitan Council

## Opening Comments

Will Craig began the session by thanking participants for attending. He then described the background and purpose of the session and read the original MetroGIS mission statement. The purpose of MetroGIS is to identify the datasets and their characteristics which would provide the greatest utility for the metro area GIS user community. Through cooperation, the goals are to cut costs, eliminate redundant work, and use uniform data.

The participants briefly introduced themselves.

Craig presented an overview of the MetroGIS modeling process. He said that today's session was in the "develop data specifications" part of the process. He directed participants' attention to the overall focus statement for MetroGIS that was posted on the wall:

### Focus Statement<sup>SM</sup>

**Definition -- Geographical Characteristics:** Physical characteristics of a geographical area, location or feature including those on, below, or above the surface of the land or water; and characteristics of other items of interest "organized" or "analyzed" by geographical areas, locations or features.

- ◆ Some examples of physical characteristics include:
  - ⇒ Area: The extent of a city.
  - ⇒ Location: The location of a street, waterfall, or a fire hydrant.
  - ⇒ Feature: The presence of minerals in an area, the width of a street, or the depth of a lake.
  
- ◆ Some examples of items "organized" or "analyzed" by geographical area include:
  - ⇒ The crime rate in a neighborhood.
  - ⇒ The pollution level at a specific location at a point in time.
  - ⇒ The species of wild flowers in a certain area.

### Scope of the Project:

- ◆ We are interested in all geographical characteristics (as defined above) of the seven county Twin City Metropolitan area that is relevant to improving:
  - ◆ The effectiveness, efficiency, and/or completeness of results at participant operations (public and private),
  - ◆ The understanding of the dynamics of the area's people, places and things.

## **Perspectives:**

*Primarily, we want to include the point of view of:*

- ◆ Individuals within units of government responsible for providing services within the Twin City Metropolitan area.
- ◆ Individuals in government agencies seeking to improve the quality of living and/or economic competitiveness of the Twin City Metropolitan area.
- ◆ Individuals making decisions about public policies servicing the Twin City Metropolitan area.
- ◆ Individuals responsible for operation of the governments of the Twin City Metropolitan area.
- ◆ Individuals concerned with improving government's effectiveness using geographical information.
- ◆ Individuals interested in maximizing sharing of geographical information.
- ◆ Individuals representing non-government organizations who might collaborate with government entities on geographical data of common interest.
- ◆ Individuals in non-government organizations who provide essential public services and who might benefit from geographical information.

*Secondarily, we want to consider the point of view of:*

- ◆ Individuals interested in geographical information within the Twin City Metropolitan area including:
  - ◆ Researchers
  - ◆ Educators
  - ◆ Private organizations (including utilities)
  - ◆ Private citizens
  - ◆ Non-profit organizations

*At this time, we will not specifically address the needs of:*

Individuals within business seeking to locate in the area.

## **Universality:**

- ◆ We are interested in geographical information covering the Twin City Metropolitan area, extensible into impacts on and from neighboring areas.
- ◆ We are interested in a sufficient level of generality so that the models and resulting systems will achieve use among the widest array of participating organizations.
- ◆ We expect the models and resulting systems to be:
  - ◆ Stable for 6 months
  - ◆ Extensible for 24 months
  - ◆ Have a demonstrable life span of 60 months

## **Level of Detail:**

- ◆ Full attribute detail.

## Information Needs

Craig then presented the group with a subset of the original 750+ information needs identified at the September 19th Forum at the Kelly Inn. These have been identified by the project team as mapping to the jurisdictional boundaries fragment, meaning the model fragment should be able to “answer” these questions. The goal was to keep the group in touch with the original requirements which drove the creation of this portion of the business object model.

### *I need to know the boundaries and characteristics of a specified jurisdiction. (ex: city, school district, county, police and fire districts)*

- Data by political districts such as county commissioner
- Location of political district boundaries of all political units from federal to local levels
- The boundaries of elected officials <districts>.
- Statutory authorities (the political subdivisions) <of a property/parcel>.
- The school district that the parcel is located within.
- <The various> jurisdictional boundaries <of an area>.
- Location of police/fire districts
- Political boundaries
- Tax districts.
- Boundaries of cities, counties, political districts, school districts, taxing areas.
- Boundaries - political, school, district, watershed, flood plain, etc. (parks, etc.).
- What are the emergency response jurisdictions?
- I need to know how and where different groups divide neighborhoods. This includes, for example, police precincts; election wards; census tracts; school districts; grids(?).
- I need to know the jurisdictional and postal office area in which any particular location is.
- What school district is a property parcel located in?
- How does that property parcel relate to any number of service districts?
- Multiple boundaries for school districts, communities and counties. Demographic data for school districts is tough to get.
- <The location of> watershed districts <boundaries>.
- What are the legal and hydrologic boundaries of watersheds?
- We want to know about wetland boundaries. This should include not only those wetlands that are legally recognized, (e.g., federal National Wetlands Inventory or state Protected Waters Inventory), but also functionally important wetlands such as ditches.

Craig next showed that jurisdictional boundaries were identified as the most important information need (an overall score of 3.38 out of 5). It was listed in the top ten needs of all four Board Groups and of five of the six Functional Groups. The needs ranking had been presented to the MetroGIS Policy Board on May 28, 1997, and the Board had approved this next, more-detailed, phase in the process. Craig concluded by outlining the next steps in the process, emphasizing that today’s session was a prototype.

The results from today’s session will be evaluated, fine-tuned, and then replicated with other high priority information needs (“first round needs”).

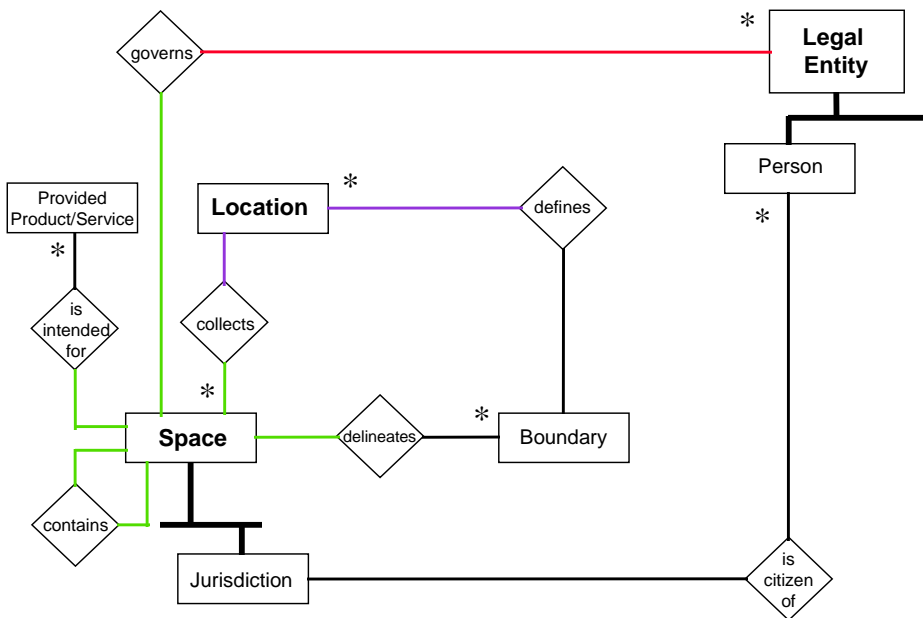
Steve Clowse then reviewed the session objectives: to familiarize participants with the work-to-date and to verify this piece (“fragment”) of the whole model. He said that the goal for the jurisdictional boundaries fragment was to assemble a multi-format collection of several boundary types, probably counties, cities, and school districts, by the end of Summer 1997. He noted that the next Board meeting will be July 30th.

Clowse briefly described his background and then reviewed the Scope of Jurisdictional Boundaries Fragment Statement:

- ◆ **I need to know ...** the boundaries and characteristics of a specified jurisdiction  
(*ex: city, school district, county, police and fire districts*).

Chris Cialek then referred the group to the diagram of the entire MetroGIS Model and explained that today’s session would focus on refining one small piece of the entire business object model.

### *Fragment: Jurisdictional Boundary*



**Figure 1**

He showed a diagram of the fragment (Figure 2) and then an example of a specific jurisdictional fragment, the Woodbury City Government (Figure 3). Today’s participants will help to define data specifications that are needed to identify three categories of data sources: those that are useful as they

exist, those that need modification, and those that need to be created). He emphasized that a working definition of *jurisdictional boundary* was essential in order to distinguish which boundaries were within the fragment’s scope and which belonged elsewhere. He mentioned that the working committee had compiled a draft list of 19 possible boundaries that might be included within the scope of jurisdictional boundaries.

### Example: City Boundary

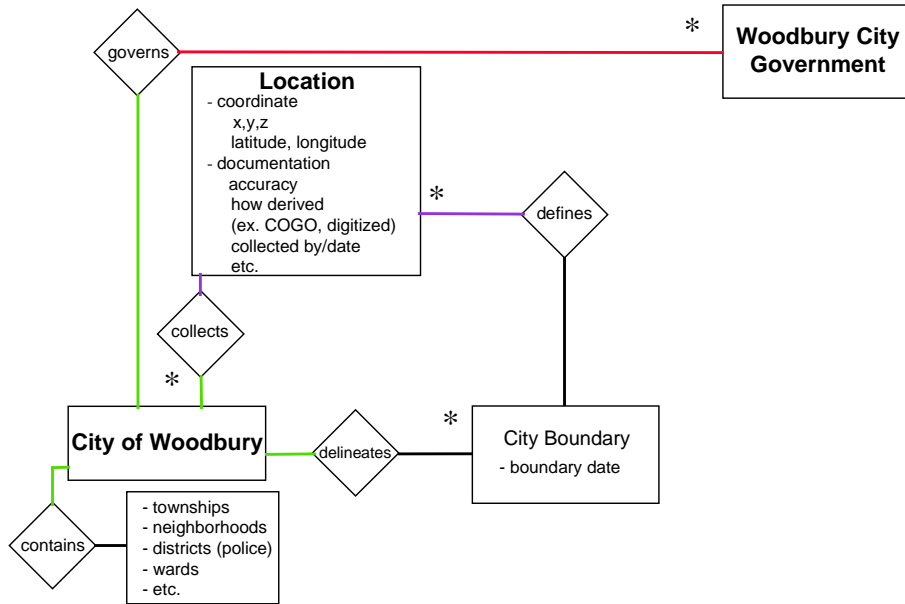


Figure 2

### Business Object Modeling

Clowse reviewed the four entities of the jurisdictional boundaries fragment from the original model: space, boundary, location, and legal entity.

Space: any three-dimensional space at any scale or level. Space may be further categorized as:

- physical
- declared (e.g., parcels, neighborhoods, communities, service districts, voting districts, political districts, analytic areas....)
- vague/informal

Boundary: physical, declared, or informal

Location: x,y,z points. Space is a collection of locations.

Legal entity: person or organization.

A participant asked whether a legal entity could be transient/mobile? For example, a person can work in one place and vote in another. Clowse reviewed the part of the model that showed a person as a citizen of a jurisdiction.

JH asked whether it was possible to get one definition that would fit all jurisdictions? She outlined her categorization of taxing authorities, voting districts, and analytical areas.

## **ISSUES RELATING TO JURISDICTIONAL AND OTHER BOUNDARIES**

### **Definition of “jurisdictional boundary”:**

A jurisdictional boundary is a legal boundary: a legal entity governs a space, that makes it a jurisdiction.

Some spaces—such as neighborhoods --- have recognizable boundaries, but they are not “governed” as neighborhoods—these would be considered as analytical areas rather than jurisdictional areas. Most people also agreed that a parcel is not a jurisdictional area: law does not define the parcel per se, or govern the parcel individually. Parcels are a separate type of entity altogether, to be covered by a separate session.

### **Types of boundary areas and their subclassifications :**

Discussion began with the list of 19 possible jurisdictional boundaries:

#### **Political**

- Indian reservations
- State
- Congressional
- Legislative
- County
- City/Township
- Sub-jurisdiction political districts (wards, police districts, precincts)

#### **Special**

- Metro Council (MUSA)
- Watershed management
- Soil conservation

#### **Emergency management**

- Fire
- Police

## **Other**

School  
Neighborhood

## **Gray Area**

911  
Special taxing  
Postal zones  
Public Land Survey  
Ambulance service districts

In many cases there was room for argument as to where to place a certain boundary type - some appeared to fall in more than one category. Participants agreed that it was more useful to generate a complete list, identify the most important ones and obtain information about these than to be able to correctly subcategorize all of the boundary types. Different types of boundaries were discussed - and where they belonged in the subclassification scheme. Some of these were transit zones, library, zoning boundaries, rail authorities, 429/special assessments, census, zip codes, unique taxing districts, special service taxing districts, mosquito control, location of polling places and registered voters.

The 'MASTER LIST' that follows was the final one developed by consensus from categories suggested by JH at the meeting.

## **MASTER LIST OF DECLARED AREAS\*\***

### ***TAXING AREAS***

- Indian Reservation
- State
- County
- City or township/other unorganized territory (airport, Ft. Snelling)
- Tax Increment Financing District (TIF)
- Special Assessment Districts (e.g., 429 districts)
- School Districts
- Watershed Management Organizations (including Watershed Districts)
- Housing Authority (HRA)
- Joint Powers Organizations
- Metropolitan Council (7-County Metropolitan Area)
- Transit Zone?

### ***SERVICE AREAS***

- Library Service District
- 911 Emergency Service Zones
- Postal Zones
- Hospital Zones
- Soil and Water Conservation Districts

## ***ANALYTICAL AREAS***

- MUSA (Metropolitan Urban Service Area)
- Census Boundary Areas
- Neighborhood/Community Areas
- Traffic Assessment Zones (TAZ)
- Planning Area (part of MUSA or a separate element?)
- Zoning Area (??)

## ***ELECTION AREAS***

- U. S. Congressional
- Minnesota Legislative
- County Commission
- School District
- Ward Precincts
- Soil and Water Conservation Districts

## ***NATURAL AREAS*** (Out of Scope)

*\*\* Note that the focus of the meeting was on jurisdictional boundaries, but several types of boundaries were identified during the discussion. This is the final list of boundaries or 'Declared Areas', and subclassifications of boundaries, identified at the meeting. Previous proposed subclassifications are outlined later in this document. The placement of the declared areas or boundary types within a subclassification is not final. There was some argument over some of the placements, and some could belong in more than one subclassification, depending on circumstances. It was felt that it was more important to create the list of all boundaries and identify the most important ones to users than to spend a lot of time debating the subclassifications.*

## **Descriptions and issues pertaining to particular boundary types:**

\* Metro E911 is a special type of boundary which involves combinations of other boundaries. There was an extensive discussion on how these are created and governed.

Metro E911 involves Fire Response, Law Enforcement, and Emergency Service Areas (EMS - Ambulance Service Areas). E911 zones are defined in terms of county, city, municipal/township boundaries in addition to the service areas of fire, law enforcement, and emergency medical services. All of these districts overlap. Any unique combination of the above boundaries is defined as an Emergency Service Zone.

Emergency Service Zones are defined by local governments. E911 works with the local governments and the State Board of Health to get those boundaries or zones defined. For a given city, township, or municipality there is an EMS entity which helps define the 911 areas. The city (or township or municipality) decides who provides the service -- and may contract out that service.

E911 boundaries, then, are a combination of traditional jurisdictional boundaries and emergency service-type boundaries. The E911 program needs to be able to take an address (eventually at the coordinate level) and identify the E911 zone and all jurisdictions in which it falls.

\* School districts: in some areas, school districts are further subdivided for election purposes, where school district representatives are not chosen at large.

\* Judicial boundaries (boundaries for the election of judges) are often subdivisions of counties.

\* Solid Waste Boundaries are 7-county joint powers agreements.

\* Soil and Water Conservation Districts generally are defined along county lines. Sometimes there is a breakdown within the county, usually to define commission election districts.

\* Tax Assessment Zones are a new area which affect taxing (RC). Rail authorities are also a taxing authority.

### **Boundary information of highest concern related to three categories.**

The following boundaries were unanimously agreed to be the most important jurisdictional boundaries:

- County Boundaries
- City and Township Boundaries
- School District Boundaries

The state and the Metropolitan Council boundary can be created by aggregating the county boundaries and therefore are not a part of further discussion.

Other boundary types identified by individuals as important to them (a second tier of importance), but not voted on by the group at large, were:

- Tax Increment Financing (TIF) Districts (RC)
- Precinct Boundaries (PL)
- Watershed Management Organizations (JH)
- Metropolitan Urban Service Area (MUSA) (PL)
- Metro E911 Service Areas (MB)

### **What do we need to know about these boundaries?**

- Who is the keeper of the boundary?
- Who determines the boundary, and who has the authority to change it?
- How do we get at the data?

## **Characteristics of the three boundaries of highest concern (county, city/township, and school district):**

**COUNTY:** The legislature is the final authority on county boundaries (the last county was created in the 1920s). Who has the official set? The Secretary of State's Office has the official description of the county boundaries - it is a legal description (i.e., words). The next question is: who has the best map (paper and digital). A map is needed to answer the question: What jurisdiction is Parcel X in?

**CITY:** City boundaries (legal description?) are kept by the Minnesota Municipal Board. The MMB sunsets two years from now.

General issues relating to both city and county boundaries:

- \* Several parties may be involved: the keeper of the legal description of the boundary; the arbiter of the boundary; the producer/keeper of the best paper map/ the keeper/producer of the best GIS data.
- \* Definition of 'best map': 'best map' could mean 'highest precision'; or 'most up-to-date' (including all the latest annexations)
- \* Characteristics of map:
  - \* Currency
  - \* Basic Unique identifiers on map
  - \* Official names on map
  - \* Positional accuracy of boundary lines.
  - \* Contact information for jurisdiction (??)
  - \* Centroid (lots of information can be tied to this )
  - \* Coincidence with other jurisdictional boundaries (city, county, township)

Issues specific to school districts:

- \* School district boundaries often have outliers and enclaves (this also sometimes happens in cities and townships) - you need to know these are there.
- \* Secessions
- \* School district boundaries may cut through parcels and through homes (since the school district lines were often laid out before areas were subdivided.) "The sad thing is that it matters" This is a special issue that needs to be dealt with.
- \* School district boundaries may span other jurisdictional boundaries.
- \* Who is the keeper of the data? County commissioners establish a school district boundary guided by state statute. School district boundaries cross county lines. Disputes go before the county commissioners. Individuals petition to the county board.
- \* Other issues identified above for cities and counties also apply to school districts.

## Boundary Location Accuracy

Issue of boundary location: how precise do we need them? How do people use the jurisdictional boundary, and how accurate do they need to be?

CC: insert from background information on subject of accuracy. (*CC referred to something about accuracy that was posted on the wall; info needs perhaps??*)

PL: Given an address or a property parcel #, we need to know whether it is in our county, city, school district, etc.

From previous information needs list: Given an address, we need to be able to tell people what ZIP code they are in and where their local polling place is.

MM: There are two levels of accuracy:

- a. general level: do the shapes line up - for certain analyses it just matters that the boundaries match.
- b. survey level: need to match the parcel map to +/- the centimeter or foot. Where on the earth is it? it needs to be absolutely accurate.

JH: Add two more levels, based on purpose:

- c: analytical purposes: define as needed
- d: taxing purposes: needs to line up to the parcel, not to the centimeter or the foot.

MK: Get the most positional accuracy and collapse up to meet the generalized accuracy needs. Use a compilation of "best available" right now for each county. Start with what's currently the "best" and build on that.

Aim to all use standard source so that comparisons are valid.

Identify what is the true need: but Mark K will use the best available and collapse it so that it matches all of the way up. Need to work from the same data.

WC: coarse (available first) and fine data - understand the data and eliminate the slivers.

CC: what are the Washington County current project specs? what should they do?

JH: purpose is to "shore up" jurisdictional boundaries - (collaboration with MetroGIS):

\* Verify boundaries (parcels almost done). Will prioritize boundaries and work into the basemap. Identify parcels as in or out. For these parcels, how to resolve boundary disputes? Clean all up. E.g., farm/subdivision - in the future, they may change the policy so that the decision of WHERE the parcels are located is made at the time of subdivision rather than later.

\* Planning doesn't require this level of detail, but would use it if it existed.

CC: What do we mean when we say parcel-level accuracy vs. planning-level accuracy?

MK: parcel-level accuracy matches the county's parcel data - i.e., the parcel boundaries are used as the building block and aggregated to create other, more generalized boundaries.

JH: suggests using a statistical approach for analysis: 98% of parcels fall within ... or 90% of parcels fall within . . . i.e., a statistical level

MM: Boundary matching: make boundaries conterminous with others whenever possible. People creating new boundaries do not (should not?) do it without reference to all other boundaries.

RJ: Parcel group may set benchmark that leads to uniform, integrated data.

MB: The positional accuracy of the data determines the number of outside users.

### **Where do we go from here - what happens now?**

JH: Needs/data content - this has been identified. Turn it over to the standards committee? Do we have enough information for standards committee to work with?

MK: I have no idea what we should do with this.

RJ: We have identified some needs, data keepers, etc. More staff work needs to be done to fill in this information.

?: Best data for these reasons. New layers - specs for these? ID reporting mechanism (??). As we understand uses, develop guidelines. Wait or use crude level and define later?

CC: Digest this information, put it into the working context (model), specify requirements. How does the group want to be involved? Create turnaround document and review it. Is there a transition back to the data content and data standards groups?

JH: Suggestions for future sessions:

What kinds of questions? What kinds of info. needs?

Before session, phone participants and gather information in order to prepare a good draft beforehand.

Use draft as starting point and then group can react.

Scope of recommendations, pros and cons.

JK: Group/order of original information needs/tasks. Since people don't usually know the level of accuracy they need.

JH: Can we find out the status of what data counties, cities, etc. already have in order to help assess what accuracy exists?

## Participant Debriefing

The goal of this activity is to collect feedback from participants to make adjustments in future sessions.

The facilitator distributed evaluation forms to the group.

Survey Results:

Respondent Number												
1	2	2	3	2	2	2	2	3	3	3	4	2.55
2	2	1	3	2	2	2	2	4	2	2	3	2.27
3	3	3	3	3	2	3	3	3	2	3	3	2.82
4	3	3	2	3	2	2	3	4				2.75
5	1	3	2	2	2	2	3	4	2	2		2.30
6	2	2	3	3	3	3	4	4	3	2	2	2.82
7	2	2	4	2	2	2	4	4	3	2	3	2.73
8	2	3	4	3	1	2	3	4	3	2	4	2.82
9	2	3	3	1	3	2	3	4	3	2	2	2.59
10	3	3	3	2	3	3	3	4	3	3	4	3.09
11	3	2	2	2	2	2	3		2	2	2	2.20

Total average **2.63**

Comments:

- 1 Not clear from the start.  
Not clearly articulated.  
[objectives]
- 2 Didn't make good use of the experts and their expertise. Too much time spent explaining the model.
- 3 Don't use the model too much.
- 4 Too much belaboring the obvious.