INTERIM REPORT FOR:
THE DEMONSTRATION OF GEOSPATIAL DATA PARTNERSHIPS ACROSS LOCAL, STATE, TRIBAL, AND FEDERAL GOVERNMENT (FGDC CAP CATEGORY 7)

MNGEO; STATE OF MINNESOTA

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Project Title: Minnesota Local Government Boundaries –
An Initiative to Support the National Map and NSDI

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PROJECT NARRATIVE

Abstract

The Minnesota Geospatial Information Office (MnGeo), working in close partnership with other state agencies and local governmental units through their statewide organizations will design and implement a collaborative and streamlined approach to manage and maintain authoritative, accurate, current and non-redundant municipal and township boundary data statewide. Because of existing legislative and administrative review requirements, once implemented, this process will be enduring. The project builds upon previous work of MnGeo and its partners, and will document the best practices, agreements, and technical characteristics required to ensure that results can be sustained over time and that will serve as a guide to extending the process to other NSDI data layers and other areas of the nation. Data will be provided through web services that fully support The National Map and other national geospatial programs. This project complements other data integration projects guided by MnGeo, which has statutory authority to coordinate GIS efforts in Minnesota, and will be implemented by staff with the skills, knowledge and experience to successfully meet the goals of this grant.

Progress Toward Project Goals

Below is a list of the seven primary deliverables identified in the project proposal together with a brief summary of progress made toward each:

1. An annually updated, authoritative version of Minnesota's governmental unit boundaries, published to support NSDI services.

In May, MnGeo completed quarterly annexation boundary updates for the Department of Revenue used to make township acreage calculations as mandated in State Law (Laws 2008, chapter 366, article 17, section 7, subdivision 3).

In October, MnGeo completed a quarterly annexation update for managing tax information in special tax districts.

Over the reporting period, the project work team completed the following technical tasks:

- Developed, set up and tested an ArcGIS SDE (9.3.1) dataset of governmental unit boundaries and related adjustment data. The encompassing Geodatabase is versioned to permit concurrent editing and to enable retrieval of archived historical data. The dataset itself contains three separate feature classes: 1) coordinate geometry data of municipal annexations and detachments in line format, 2) an aggregation of these line data into polygons according to their entailing adjustment docket number, and 3) the final city, township and unorganized territory boundaries in polygonal format.

- Loaded a complete boundary data set into this new Geodatabase and improved the geometric accuracy of some local boundary data using Advanced Editing Traverse Tools in ArcMap (see Figure 1).
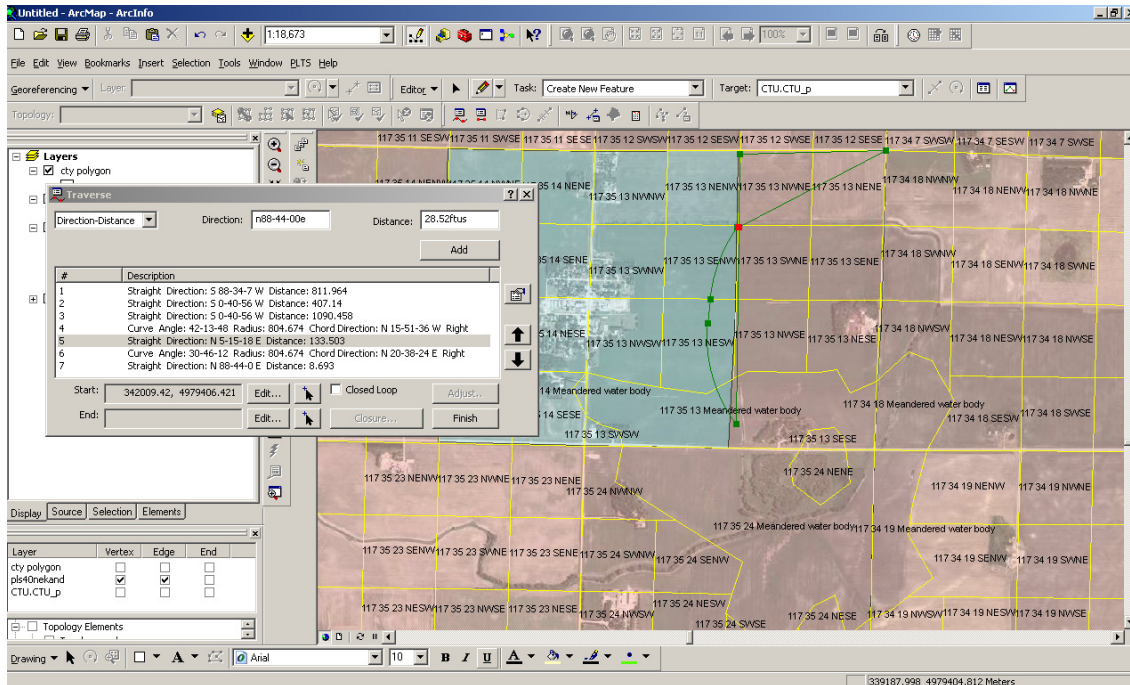
Figure 1. The ArcGIS Traverse tool applies coordinate geometry (COGO) obtained from as-read legal survey descriptions provided in an approved boundary change petition from the Municipal Boundary Adjustment Unit to insert boundary realignments as part of the annexation process.

- Established topology rules that govern the geometric logic applied to newly inserted boundary data, eliminating gaps and overlaps.

- A static updated boundary data set (name: MNGUBS10) has been captured and is being streamed through a Web Feature Service for MnGeo customers.

  The data may be viewed at: http://www.mngeo.state.mn.us/wfs_moose/
  GetCapabilities requests may be directed to:
  http://geoint.lmic.state.mn.us/cgi-bin/mapserv?map=/home/httpd/html/cap/gubs.map&service=wfs&version=1.0&request=GetCapabilities
  Metadata may be retrieved at: http://www.mngeo.state.mn.us/chouse/metadata/mnctu.html

2. Identification of local boundary data that meet currentness and horizontal accuracy standards and integration of these data to a statewide coverage.

MnDOT staff members, particularly those within the *Transportation Data and Analysis Division*, have received and reviewed boundary adjustment information from MnGeo together with detailed descriptions of the processes involved in their collection. In response, MnDOT has provided detailed adjustments based on digital techniques developed in that agency over more than 20 years of working with annexation

data to provide information to calculate Highway User Tax Funds (State Aid) distributions. This review process is currently underway and is leading to incremental improvement to MnGeo's boundary dataset.

Occasionally the processing of approved annexation dockets presents challenges. Legal descriptions in approved boundary petitions can sometimes be unclear or incorrect, and may not have been discovered through the formal review process. A newly designed decision tree, describing how the processing of all dockets is to be conducted, is currently being tested in an effort to address the issue of unclear or insufficient legal descriptions. Figure 2 summarizes the minimum steps required to process and track approved dockets.
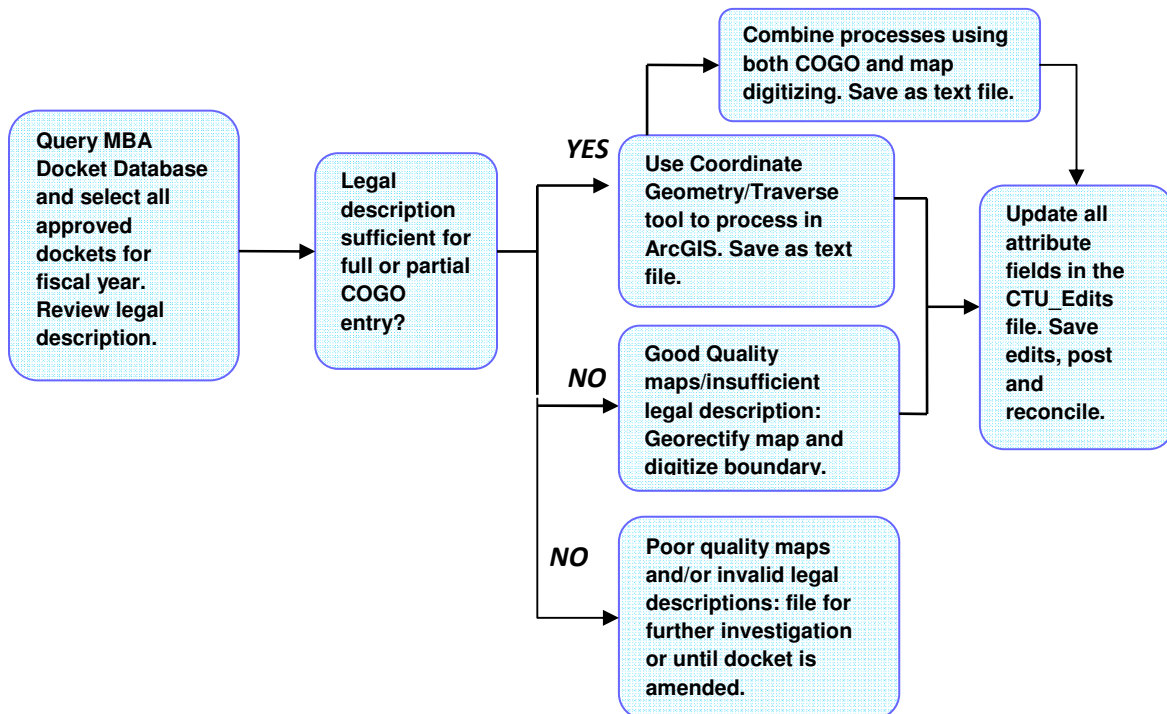

Figure 2. Docket Processing

In conjunction with the Municipal Boundary Adjustment (MBA) Unit of the Office of Administrative Hearings, MnGeo has developed an annexation docket management system (Figure 3), providing public access to current and historic annexation petitions. During the reporting period, MnGeo added a scanned document upload function, which provides hyperlinked access to maps and documents germane to each boundary adjustment case. The Municipal Boundary Adjustment docket management system may be accessed at: http://www.mba.state.mn.us/index.html

Minnesota has established a state standard for municipal identification codes that follows the feature IDs for Civil features found in the U.S. Board on Geographic Names Geographic Names Information System (GNIS). Widespread use of the standard, referred to locally as the *CTU code* (City, Township, Unorganized territory), requires that changes in the status of municipalities be reflected quickly in the GNIS database. To this end, both MnGeo and the Metropolitan Council of the Twin Cities are formally recognized as GNIS partners, with authority to register requests for code updates when necessary. MnGeo is taking municipality information provided by the MBA Unit and having historical GNIS records created so that the archive of annexations in Minnesota can be expanded. During the reporting period, 20 such requests were processed. More information on the Minnesota CTU Standard can be obtained at: http://www.mngeo.state.mn.us/CTU/

Figure 3.   About 250 annexation petitions are filed each year in Minnesota and managed through the Municipal Boundary Adjustment docket management system.

3. Documentation of data specifications and attributes required for compliance with NSDI standards, including an investigation of issues concerning vertical integration with other layers and horizontal integration with other regions.

The work team has identified those established updating procedures that can be streamlined and standardized to meet NSDI requirements and create a more efficient and accurate process of maintaining and publishing governmental boundary data.   Historical boundary datasets and processes have been reviewed to identify common and standard attribute data required for public, in-house and agency specific use (e.g. MnDOT).   Tables 1 and 2 illustrate the fields and domains identified through this review process. Further review and refinement of dataset attributes will take place at stakeholder meetings scheduled in January 2011.

4. Documentation of processes maintaining governmental unit boundary data that reflect best practices that reduce redundancy, improve accuracy and assure timeliness.

The work team has compiled an early draft version of *best practices and procedures* documentation that describes, in detail, the steps and procedures necessary for processing boundary changes to cities, townships and unorganized territories in Minnesota using the systems developed as part of this project. This documentation is currently being prepared for stakeholder review.

5. Model agreements with state agency and local governments that clarify roles, responsibilities and relationships required to sustain the boundary update process.

The project work team has created a potential advisory committee list and has met on a number of occasions with technical advisors from one of its primary stakeholders, MnDOT, to review data requirements and discuss potential service agreements for updating and maintaining boundary data.

Discussions regarding the creation of a secure web form for cities and counties to submit updates and corrections to boundary data have been initiated, identifying potential pilot counties with sufficient annexation activity to test the process. Candidate counties are located within the seven county metro area of Minneapolis/St. Paul.

6. Recommendations for changes to state statutes and rules, shifting or consolidating responsibilities or budgets, or any other actions required to support best practices and ensure an authoritative data source.

This goal was not addressed during the reporting period.

7. Communicate project activities and milestones to public, partners and potential stakeholders.

This goal was not addressed during the reporting period.

Table 1: Feature Class Domains

Domain Name	Description	Code	Description
Adjustment Type(ADJ_TYPE)	Type of Municipal Boundary Adjustment (MBA)		
		1	Annexation (A)
		2	Orderly Annexation (OA)
		3	Detachment (D)
		4	Concurrent Detachment and Annexation (D/A)
		5	Incorporation (I)
		6	Consolidation (C)
		7	Dissolution (DC)
CTU_Type	Type of Minnesota local government boundary		
		0	Unorganized Territory
		1	Township
		2	City
METHOD	Method of adding MBA feature		
		0	Unknown
		1	Digitized
		2	Both COGOed and Digitized
		3	COGOed
		4	Other
Relative Accuracy (REL_ACC)	Relative Accuracy of MBA feature in closure report of traverse		
		0	Unknown
		1	Relative Error Ratio > 1:1000 (worse)
		2	Relative Error Ratio <= 1:1000 (better)

Table 2: Feature Class Fields and Associated Domains

Field Name	Type	Domain
OBJECTID	Object ID	
DOCKET	Text	
REL_ID	Text	
FROM_NAME	Text	
TO_NAME	Text	
FROM_GNIS	Text	
TO_GNIS	Text	
STAFF	Text	
LOAD_DATE	Date	
METHOD	Long Integer	Method
REL_ACC	Long Integer	Relative Accuracy
NOTES	Text	
CTU_TYPE	Long Integer	CTU Type
ADJ_TYPE	Long Integer	Adjustment Type
SHAPE	Geometry	
SHAPE.AREA	Double	
SHAPE.LEN	Double	

NEXT STEPS

- Begin partners review process by planning and hosting a stakeholders committee meeting in January, 2011.

- Validate minimum data requirements and best practices through stakeholder review. Integrate findings into boundary data management processes and Best Practices documentation.

- Secure pilot program agreement(s) with partner counties.

- Continue to refine boundary data accuracy.

- Establish service agreements with interested stakeholders.

- Address issues of Unorganized Territories; especially: county/federal incompatibilities

REVISED TIMELINE

Project tasks, organized by objective, were laid out early in the project's lifecycle. Below is a status report of progress made on each task with completed tasks identified in green and indications of due date changes, where necessary, indentified in red. The project work team is not considering any request for a project extension at this time.

Task	Status	Notes
Objective 1 : Create a current boundary database Initial completion date: 10/15/2010		
Determine authoritative documentation requirements	In Progress	First draft of best practices documentation completed 09/14/2010. Needs stakeholder review, acceptance. Change due date to 02/15/2011 to coincide with Objective 2 deadline.
Obtain Benton County/City of Rice materials - update boundaries	Not Begun	Change due date to 03/31/2011
Obtain docket for Lamberton annexation - update boundaries	DONE	
Obtain Eagles Nest Township materials - update boundaries	DONE	
Obtain Crane Lake Township materials - update boundaries	DONE	
Contact Counties, assemble resources for Unorganized Territories	In Progress	Background work begun; counties not yet contacted. Change due date to 05/03/2011.
Update Unorganized Territory boundaries	Not Begun	Change due date to 05/03/2011.
Understand counties UT scheme - develop county/fed harmonization strategy	Not Begun	Change due date to 05/03/2011.
Identify resources to assist with local boundary data collection	Not Begun	Change due date to 05/03/2011.

Objective 2 : Develop a Versioned Geodatabase Completion date: 02/15/2011		
Build a data model using Federal best practice standards	DONE	
Incorporate stakeholders' information needs (i.e. best practices)	In Progress	Significant work accomplished in evaluating MnDOT procedures and incorporating them into MnGeo design. Understanding Revenue's needs and delivering appropriate content has been routinized. Need now to bring other stakeholders into discussion.
Construct a versioned, expandable geodatabase	DONE	
Investigate web editing services; report findings	In Progress	Preliminary planning begun; web form template prototype under development; discussion with Wright or ?? counties planned.

Objective 3: Consolidate Multi-Agency Efforts to Update CTU Data Completion date: 03/15/2011		
Identify MnDOT business requirements	In Progress	Working at detailed level; DOT evaluation MnGeo edits, providing corrections,
Incorporate those requirements into Task 2.b.	Not Begun	
Establish Service Level Agreement with MnDOT	Not Begun	Preliminary discussions; relationship building; moving forward
Explain project goals to other stakeholders and evaluate/document their requirements	Not Begun	This work has not gone beyond MnDOT/Revenue/SOS

Objective 4: Improve Boundary Accuracy and Expand Database Feature Classes Completion date: 03/15/2011		
Establish communications portal to submit data error reports	Not Begun	
Seek DCDC help in thinking through integrating a cadastre feature class	Not Begun	Preliminary contact/meeting made
Develop a finding of fact report evaluating potential integration of cadastre data	Not Begun	
Identify other boundary types for future integration	Not Begun	

Objective 5: Project Administration Completion date: 05/02/2011		
Generate a bi-weekly status report	In Progress	Reports are submitted ahead of each work team meeting
Determine advisory committees that need to be created for this project	In Progress	
Provide general project administration	In Progress	

ATTACHMENTS

The best practices document under development for this project is only now being prepared for broad stakeholder review and is not, therefore, in a form convenient for distribution at this time. The working document's table of content is provided here to provide an indication of its scope.

BEST PRACTICES:
Updating and Maintaining City, Township and Unorganized Territory Boundaries Using ArcSDE

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