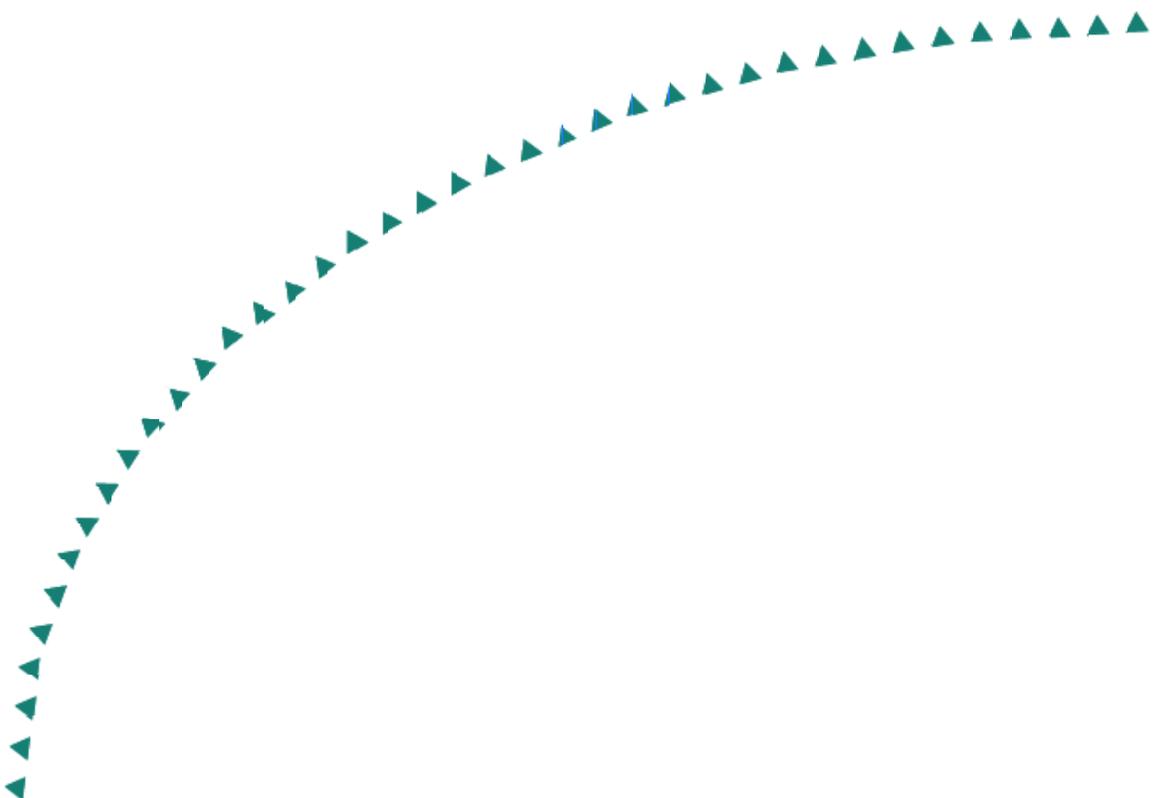# Enhanced Coordination of Cadastral Information

Research

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Any Minnesota Department of Transportation (Mn/DOT) project conducted by Mn/DOT that impacts property owners requires the coordination of cadastral (land ownership) and highway right-of-way information. The timely and accurate identification sharing and coordination of cadastral information is the basis for well-managed highway projects. Mn/DOT has already taken a step towards improving coordination between Mn/DOT offices and other government agencies with the State Parcel Map Inventory (SPMI), a resource with information about the status and accuracy of cadastral information in 87 Minnesota counties. Government agencies have seen the potential in the SPMI to better optimize data development and exchange through the use of GIS technologies. The finding of this project suggest that the SPMI is a starting point for helping coordination, but more targeted efforts are called for. Considering the heterogeneity of local government, individual relationships between organizational staff are crucial to overcoming institutional and technical obstacles.

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# Enhanced Coordination of Cadastral Information

**Final Report**

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# Acknowledgements

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# Executive Summary

Any project conducted by the Minnesota Department of Transportation (Mn/DOT) that impacts property owners requires the coordination of cadastral (land ownership) and highway right-of-way (ROW) information. On average, for the approximately 12,000 miles of interstate, state, and county highways in Minnesota 2.5 property transactions occur daily [1]. The timely and accurate identification, sharing, and coordination of cadastral information is the basis for well-managed highway projects. Mn/DOT has already taken a step towards improving coordination between Mn/DOT offices and other government agencies with the State Parcel Map Inventory (SPMI), a resource with information about the status and accuracy of cadastral information in 87 Minnesota counties [2]. Government agencies have seen the potential in the SPMI to better optimize data development and exchange through the use of geographic information system (GIS) technologies. A precept for fulfilling this potential lies in identifying institutional obstacles including the definition of common needs and relationships, identification of restrictive barriers to collaboration, and determination of workable solutions.

Many of the local government agencies interviewed utilize the SPMI to understand fulfilled and unfulfilled coordination needs. Yet, at the same time they point out the limitations of the SPMI. In their eyes, the SPMI lacks sufficient detail for their questions about specific monumentation activities, offers better support for finding parcel information, and orientates too much towards state-level interests (in general) and questions. These perspectives are related to the very limited financial support available for local government cadastral activities. In smaller counties, the cadastral information required is focused on the immediate task of tax collection. Discrepancies between tax calculations and actual parcel surveys are addressed on an as-needed basis. A transportation project is seen as a potential for great improvement of the parcel surveys, but the all too frequent lack of trusted relationships and clear communication with Mn/DOT can lead to the growth of false hopes and disappointment over the missed opportunities.

Interviews and surveys underscore the importance of personal relationships among staff from different institutions. These relationships form a network of trust and social capital that benefits the practical organization of ROW projects. Even within a county government it is hard to identify common needs and relationships; each county office and officer is required by state laws and regulations to fulfill distinct mandates; relationships vary for organizational, political, and personal reasons. Size matters. Smaller county and municipal governments can be characterized on one hand by officials taking on multiple functions, and on the other hand the division of function corresponds to the type of position. For example, an assessor may take on auditor functions, but never registrar functions. Common needs between Mn/DOT and county and municipal officials arise in spite of different interests and needs because projects occur in a place that is of interest for all involved parties. Restrictive barriers to collaboration between Mn/DOT and local governments are much smaller when communication works. The complexity and variability of local government organizational forms hinders the implementation of formalized procedures for data sharing and project organization. Regardless, if the local government uses GIS or not: the human dimension remains very important to ROW projects.

Of course a significant impairment for ROW projects is the lack of GIS cadastral data in many local governments. The SPMI statistic, that approximately 50% of all counties in Minnesota lack a cadastral GIS has not changed. Many counties have some GIS cadastral data, but almost 25% of the survey's respondents have none [2]. Counties see great potential for collaborating more closely with Mn/DOT and improving their cadastres. Collaboration would also be a means of supporting the collection of more complete and accurate cadastral surveys. Right now, the low accuracy and unsystematic recording of new surveys constitute major technical impediments that require costly administrative solutions (new surveys or manual searches of county records).

The survey and interview instruments used in this research for both Mn/DOT offices and other government agencies focused on institutional issues. These institutional issues include the definition of common needs and relationships, identification of restrictive barriers to collaboration, and determination of workable solutions for Mn/DOT. Personal relationships, which are integral to the creation of trust between government agencies, were assessed from interviews, the focus group meeting, and comments on surveys. This report also includes anecdotes to highlight some of the relationships identified in the study which improve the coordination of cadastral information sharing for right-of-way projects.

# Chapter 1
# Introduction

Cadastral information is essential for most government activities. Any activities involving the change of existing facilities, acquisition of new facilities, or sale of facilities will take land parcels recorded in the cadastre into account. The ubiquity of the cadastre makes it easy to look in and focus on activities and facilities, yet without the cadastre they could neither be coordinated nor developed. Perhaps, the significance of the cadastre is also conveniently overlooked because of the negative associations most people have with property taxes, which are coordinated and collected also with the cadastre. The cadastre is primarily maintained by local governments (municipalities or counties) and state government activities must be coordinated with these authorities when land ownership or use rights are involved [4]. Persistent difficulties in coordinating the cadastral activities of various levels of government in Minnesota remain in spite of the wide-scale adoption and significance of the cadastre. This study focuses on how cadastral information-sharing related to Mn/DOT right-of-way (ROW) activities can be improved. The reliance of Mn/DOT on the cadastre is exemplary for other state government agencies. Regardless of the agencies involved, without a cadastre, government could not function.

This is also true for any Mn/DOT transportation project or activity. Cadastral (land parcel) information created by various Minnesota government agencies (state, county, city, federal, tribal governments) forms a critical resource for Mn/DOT highway planning, maintenance, and upgrading projects. A statewide inventory of this information, the Statewide Parcel Map Inventory (SPMI) was completed in 2001 and made available on the Internet (http://olmweb.dot.state.mn.us/SPMI/) [3]. It has become an important resource and opens the door to possibilities for enhanced coordination between Mn/DOT and local governments. Information about 87 counties' activities (with contact information when available) is an integral part of the SPMI. Because activities change frequently and non-survey participants requested that information about their cadastral information be added to the SPMI, Land Management Information Center (LMIC) is supporting an update process for the SPMI that will meet Mn/DOT needs.

The ROW activities of Mn/DOT are significant. Approximately 900 projects yearly have a cadastral component [1]. Any project that impacts property owners requires the coordination of cadastral (land ownership) and highway right-of-way information. The timely and accurate identification, sharing and coordination of cadastral information is the basis for well-managed highway projects. Government agencies have seen the potential in the SPMI to better optimize data development and exchange through the use of GIS technologies. A precept for fulfilling this potential lies in identifying institutional obstacles including the definition of common needs and relationships, identification of restrictive barriers to collaboration, and determination of workable solutions. Coordination is the keyword for considering how Mn/DOT ROW activities can be improved.

ROW information coordination involves all levels of Mn/DOT. Mn/DOT district offices have a variety of relationships with government agencies related to the sharing of the cadastral

information. The SPMI is important and the formal activities involving land must be coordinated with local governments. The research for this study also establishes that informal relationships and activities are critical to the coordination of the formal activities. This is especially true for activities involving local governments with their complex and variable organizations. However, results suggest that these informal relationships and activities are under-rewarded and largely undertaken with personal motivation. Local government officials interviewed for this study repeatedly underscore the importance of having these relationships and gaining insight into ongoing Mn/DOT activities and developing trusted relationships with individuals in Mn/DOT who represent the whole agency. From the Mn/DOT perspective this is important because of the high complexity of local government organization and the sometimes outspoken personalities who occupy important elected positions in local government organizations.

# Chapter 2
## Project Objectives

Cadastral (land parcel) information is created by various Minnesota government agencies (state, county, city, federal, tribal governments). This information forms a critical resource for Mn/DOT highway planning, maintenance, and upgrading projects. A statewide inventory of this information, the Statewide Parcel Map Inventory (SPMI) was completed in 2001 and made available on the Internet (http://olmweb.dot.state.mn.us) [3]. Information about 87 counties' activities (with contact information when available) is an integral part of the SPMI. Because activities change frequently and survey non-participants requested that they be added to the inventory of the SPMI, LMIC is coordinating an update process for the SPMI that will also meet Mn/DOT needs. Mn/DOT district offices have a variety of relationships with government agencies that this research examines to facilitate the sharing of the actual cadastral information between the various holders of the information. Further, this research examines how other government agencies utilize the SPMI to understand fulfilled and unfilled coordination needs. The survey and interview instruments used in this research for both Mn/DOT offices and other government agencies will identify institutional issues including the definition of common needs and relationships, identification of restrictive barriers to collaboration, and determination of workable solutions for Mn/DOT.

# Chapter 3
# Project Activities and Methods

## Overview

This project involved a combination of quantitative and qualitative methods developed through discussions with the project's Technical Advisory Panel (TAP) and through inductive refinement of the questionnaire from interview to survey. The questionnaire consisted of approximately 30 questions grouped in three areas:

- General Questions
- Cadastral Questions
- Data Sharing Questions

The interview and survey portions of the research were followed by a focus group discussion of preliminary results.

## Interviews

Interview questions were developed first in a draft survey instrument, circulated to all TAP members and Dr. Will Craig. Comments and suggestions were included in a revised survey instrument. Seven interviews were conducted in October 2004 with the following agencies and individuals.

1. Carver County, *John Freemeyer,* County Surveyor
2. Sibley County, *Calvin Roberts,* County Assessor
3. Mn/DOT Central Office, *Ron Olson*, Legal Description Supervisor and *Rick Morey*
4. Mn/DOT District 4, *Tom Harper*, Mn/DOT Surveyor
5. Mn/DOT District 6, *Mark Trogstad-Isaacson*, ROW Engineer
6. St. Louis County, *Jeff Storlie*, GIS (Geographic Information System) Specialist
7. Fond Du Lac Indian Reservation *Tim Krohn,* GIS Specialist

The interviews covered the same set of questions that had been faxed to the interviewee in advance. The balance between counties and Mn/DOT staff reflects the overall project emphasis on understanding parcel data-sharing issues both among Mn/DOT offices and with other governmental agencies, particularly counties because of their responsibility for parcel information in most areas of the state. The Fond Du Lac Indian Reservation was included to assure that we accounted for this significant group in the state.

From the county interviews we developed an understanding of parcel data sharing that remains predominantly informal. That is, data sharing occurs on the basis of and through personal connections. These relationships are complex and sometimes fraught with difficulties, but are preferred because of the inherent complexity of parcel information and the varying arrangements for handing parcel information. The three interviews highlighted three different organizational approaches to parcel-information recording, maintenance, and improvement.

Table 3.1 Response rates by government unit type

|  | Sent | Returned | Percent |
|---|---|---|---|
| County | 87 | 61 | 70% |
| Municipality | 6 | 4 | 67% |
| Indian Reservation | 11 | 3 | 27% |
| National Forest | 2 | 0 | 0% |
| Total | 106 | 68 | 64% |

Mn/DOT interviewees in the field echoed the importance of personal relationships to help address the inherent complexity of parcel information. Even when digital data is available, because parcel data is held by counties in different ways (a varying division of labor between assessor, auditor, and recorder), it is still necessary to have personal visits with the county offices. This is not seen to be an undue burden because it is also an essential part of coordinating all projects with the counties. The Mn/DOT interviewees in the field stressed the ease with which they can request previously acquired documents from the Mn/DOT Central Office but underscored the complexity and need for development of some of the parcel data information management systems in place, e.g., REALMS.

In summary, the interviews suggest that the main issues for parcel-data sharing and coordination arise in the division of governmental activities. Not only in smaller county administrations with long-established personal work practices, but also in larger counties, the interviews point to an almost idiosyncratic division of many parcel-related activities. Further, the interviews suggest that staff are fully aware of the complexity, but are lacking resources to improve and standardize their activities, and are able to make only incremental improvements.

## Surveys

Building on results of interviews held with seven agency representatives, the survey consisted of the same core questions, with some clarifications and additions. Clarifications were also made to the final survey instrument based on TAP comments on the draft instrument. The interviews suggested that cadastral information-sharing activities were predominantly informal and that the division of responsibilities for cadastral information is divided among several county agencies.

The survey consisted of questions in three domains:

- General
- Cadastre
- Data Sharing

**General** questions covered the respondents' parcel related work activities, office, and knowledge of the SPMI. **Cadastral** questions addressed issues related to surveying of parcels, use of technology, and other characteristics of their cadastral information. The **Data Sharing** questions
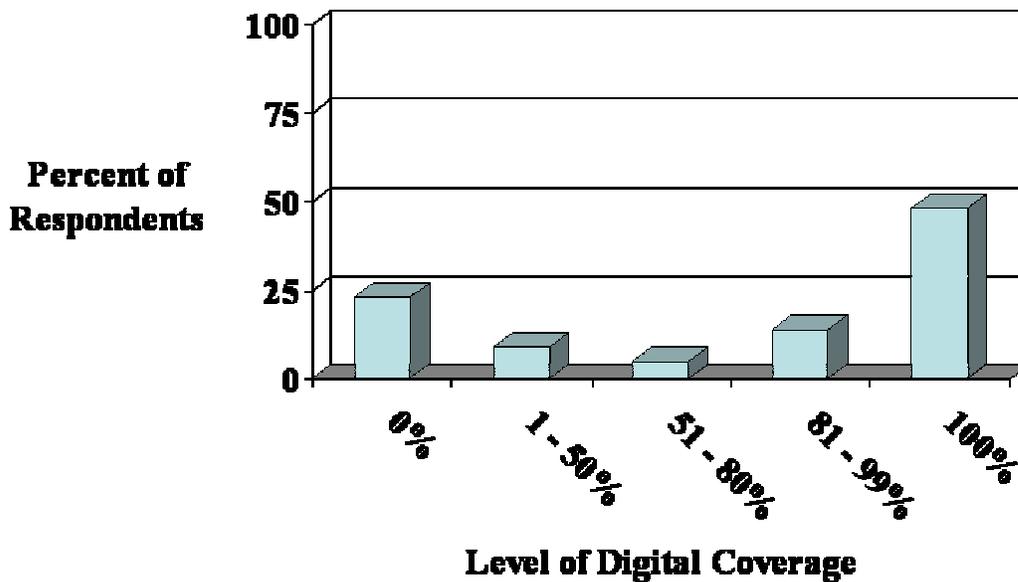
Figure 3.1 Percent of cadastral data in digital format

raised issues about current and future cadastral information-sharing activities and collaboration with Mn/DOT.

## Survey Evaluation

By February 20th 2005, we received 68 out of the 106 surveys distributed in mid-December. The survey responses confirmed our evaluation of the interviews, but made clear that one of the main hindrances to cadastral information sharing is simply not having digital data; 23% of the respondents have no digital data. While this result corresponds to the SPMI 2004 results, considering the interview and survey responses makes it clear that the creation of digital cadastral information in one county or municipal office is often limited to that office alone. In other words, the split of cadastral functions between assessor, auditor, recorder, registrar, surveyor, and possibly GIS, means that the digitization of information is often only for a particular function and mandate. The recorder, who not only records deeds etc, but also distributes parcel-related information, usually lacks digital cadastral information.

Currently, plat books sold by secondary publishers occupy an important niche in disseminating cadastral information in rural areas. Inter-governmental cadastral-sharing activities are impaired by the lack of a mandate requiring coordination among local government offices. In this environment, informal cadastral information sharing becomes the most functional means for data sharing and also makes it possible for Mn/DOT staff to obtain assistance beyond the possibilities of formal data sharing arrangements.

It is important to note that in this report, the term "respondents" refers to those individuals who answered a particular question. Further, care should be taken in interpreting the percentages due to the varying number of non-responses.

## Evaluation of General Questions

A significant question of the survey deals with coordination.

> 1. In which county/municipality office do you work? Which offices in your county/municipality do you coordinate parcel information with?

A matrix relating the respondents' work office to the other offices reveals the following:

- assessors coordinate mainly with auditor and recorder, and have only limited coordination with surveyor (n=15)
- auditors coordinate with assessor, and have very limited coordination with surveyor (n=6)
- recorders/registrars coordinate with surveyor mostly (n=3)
- surveyors coordinates with all (n=3)
- GIS coordinates most often with auditor and assessor, less often with surveyor and recorder (n=9)

Because of the small number of responses to this question, these results should be considered carefully. Also taking into consideration the interviews, we suggest that the assessor occupies the most significant role in the surveyed local governments. This has important consequences for cadastral information sharing. They bear out remarks on this issue made during interviews and also on discussion in the focus group meeting.

The importance of the assessor is also indicated in the result that tiff and shp formats are the most common in respondents with digital information. Surveyors would generally work with other formats for storing data. Tiff files are raster images without any accurate coordinates and shp files have no provisions for recording metadata. Almost 97% of respondents stored data in tiff format; 87% in shp format (54% of respondents left this question blank).

**Possible coordination in local government**
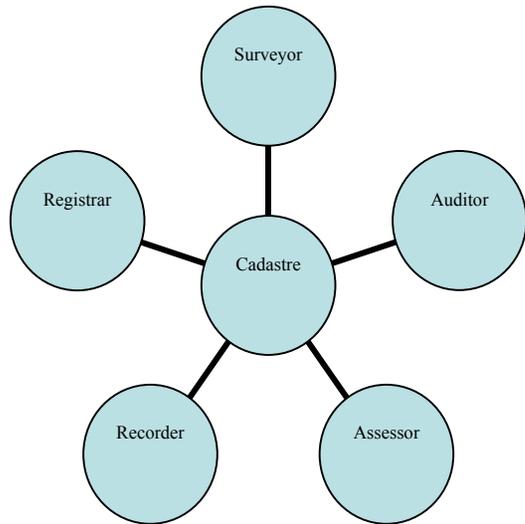


Assessor coordinates with Auditor, surveyor, surveyor, and recorder
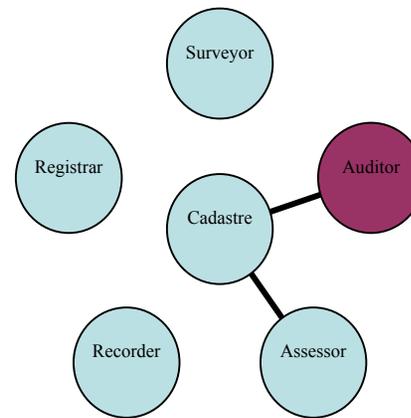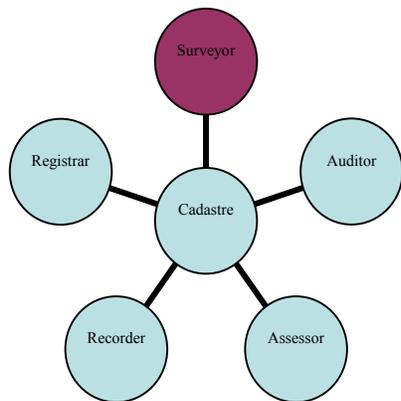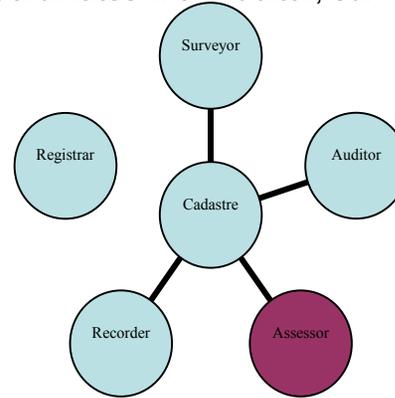
Surveyor coordinates with all

Auditor coordinates with Assessor

Figure 3.2 Common forms of cadastral coordination in Minnesota local governments

Regarding the SPMI, it is interesting to note that 59% of the respondents indicated they are aware of the SPMI. 41% indicated no awareness of the SPMI. 20% said they used the SPMI and 57% said it was useful, however 80% of the respondents left this question blank.

## Evaluation of Cadastral Questions

As indicated earlier there is a clear bifurcation between respondents with 100% digital linework (50%) and respondents with no digital linework (23%). In between, most of the respondents cluster around having 30-50% of their linework in digital format. This is backed up by the 49% of respondents who indicate they could provide a list of parcel IDs for an arbitrary geographic area—a common GIS-based function. Given the comments of many respondents referring to their dynamic projects that are getting underway, we can expect this to change in the near future even. Of course, the other local government offices may face different circumstances.

75% of respondents use the .shp format for parcel linework; 31% use .dwg format, and 13% use .dgn (some used more than one format, for example some said they create linework in one format and store it in another). 36% of respondents said they can provide output in .dgn format and 64% cannot. Most respondents cannot say how parcels were defined (58%), but most track changes (57%).  80% of respondents maintain 100% of information on boundary ownership. Lost corners are not an issue for most respondents; of those who say they are a big issue 60% have some sort of remonumentation plans.

Most respondents (79%) coordinate parcel documents with other local government offices, but only 59% coordinate parcel linework with other parcel documents (e.g., deeds), even though 90% indicated they store digital images of deeds. In fact, only 13% indicate they digitally link linework with documents. 65% of respondents indicate they plan to improve coordination, mainly through linking databases and 46% said they have projects to improve older parcel data. However, only 40% of the respondents have a budget for improvements. Only 12% of the respondents indicate they have an accuracy of <1 foot and only 9% can determine the accuracy of all parcels. Most of the digital linework has been collected using coordinate geometry (COGO) alone (42%) in county coordinates (60%) without field reconciliation. (30% indicated yes to this question).
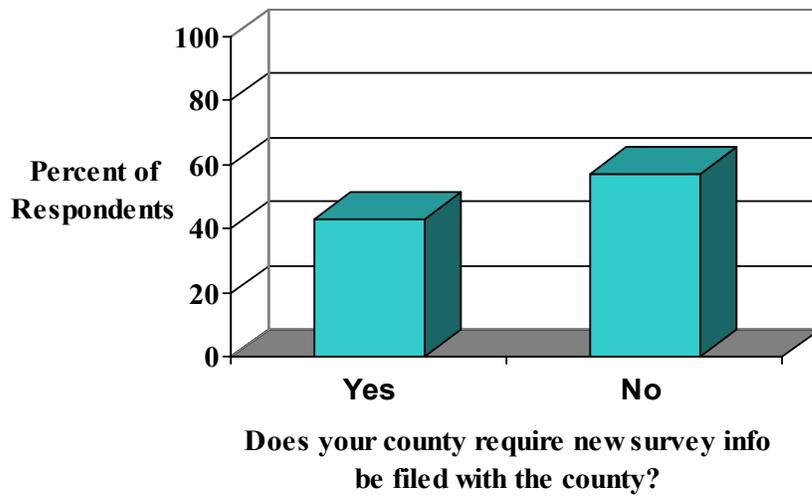
Figure 3.3 New survey filing requirement in counties

These responses underscore that the activities of local governments in Minnesota are frequently insufficient when measured against surveyor requirements. The problems here are significant. For example, without up-to-date information about new surveys made in the county, the title and survey registries of a county must be searched by hand to establish if a project potentially impacts a newly surveyed area. Even when the county or municipality has up-to-date materials, the parcel map accuracy is very low, requiring new more accurate surveys.

Table 3.2 Sharing Partners

| Sharing Partner | | Total Responses | Percent |
|---|---|---|---|
| Public | | | 70 |
| | – Municipalities | 18 | 23 |
| | – Intra-county | 13 | 17 |
| | – DNR | 6 | 8 |
| | – Counties | 5 | 6 |
| | – State / Federal Gov't. | 5 | 6 |
| | – Data Clearinghouses | 3 | 4 |
| | – Dept. of Revenue | 2 | 3 |
| | – Mn/DOT | 2 | 3 |
| | – Farm Service Agency | 1 | 1 |
| Private | | | 24 |
| | – Other | 6 | 8 |
| | – Realtors / Appraisers | 4 | 5 |
| | – Utilities | 4 | 5 |
| | – Consultants | 2 | 3 |
| | – Private surveyors | 2 | 3 |
| Universities and non-profits | | | 6 |
| | – Environmental Orgs. | 4 | 5 |
| | – Universities | 1 | 1 |
| | Total | 78 | 100 |

## Evaluation of Data Sharing Questions

Most county and municipal government respondents (70%) share cadastral information with other offices. Email, CD, and FTP/Web dominate as types of media for data sharing and 54% of the respondents indicate they charge for data, usually following a price scheme. Of the respondents, 82% say they limit the further distribution of data. Only 12% use data subscriptions, but 31% maintain a web site for data sharing.

24% of the respondents think their jurisdictions support open data sharing; 74% think they would like to collect fees. Most (57%) respondents say they plan to increase data sharing; 16% say they have no such plans, and 26% failed to answer this question. On this issue, 54% indicate that financial support from federal and state agencies would be helpful, followed by 35% who indicated training and education, and 29% indicated standards. Authority for data sharing mainly lies with county boards or commissioners.

Many obstacles to data sharing exist. The most commonly indicated hindrance to data sharing was cost (75%) followed by authority (41%) and compatibility (35%). Several respondents wrote in accuracy as a hindrance. About half of the respondents say they would add another field to their database to improve data sharing and 10% wrote in "maybe." 25% of the respondents failed to answer this question.
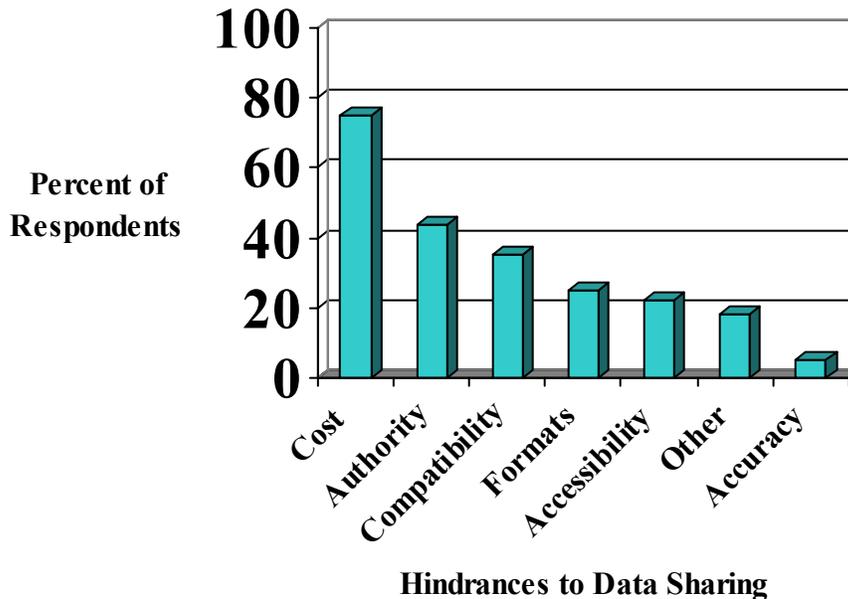


Figure 3.4 Obstacles to data sharing in order of importance for survey respondents

It is important to note that metadata is already created by 46% of the respondents; 29% in MGMG and 29% in "ESRI formats". Other agencies' metadata was used by 72% of the respondents but 37% left this question blank.

Cooperation with Mn/DOT rests on a good foundation. The relationship to Mn/DOT was positively valued by 71% of the respondents and 27% said "N/A"; 73% acquire data from Mn/DOT, mainly ROW linework. Mn/DOT efforts to improve positional accuracy of surveys across the state with the corner-section remonumentation program (likely Mn/DOT's County Control Densification Partnership Program) were recognized by a number of respondents.

# Focus Group Meeting

## Evaluation of the Focus Group Meeting

With the results of interviews and surveys, a focus group meeting was organized to discuss the preliminary results and discuss workable solutions for Mn/DOT to the problems identified in the research and discussions. In summary, the focus group meeting concluded that opportunities lie in supporting better relationships between Mn/DOT staff and local government and the support of Mn/DOT and state governments that help address the accuracy and lack of digital data identified in interviews and surveys.

In regards to the interviews and surveys, focus group meeting participants highlighted that unknown cadastral data sources still have been overlooked. Cadastral data is also produced by major contractors, regional organizations (a SW Regional Governmental conglomeration was specifically mentioned), plat books, and data clearinghouses. The SPMI provides valuable insight into most governmental resources, but not to all digital parcel data producers. This research augments the realization of the complex web of institutions involved with cadastral data.

The following is a summary of other key points discussed at the focus group meeting:

**Collaboration Policy**

Mn/DOT has internal and external collaborations that can benefit from enhanced effort to improve the exchange of general and project-related data. An internal focus on technologies (learning and integration with existing technologies and organizations) is detrimental to the important relationships with other Mn/DOT offices, departments, municipal offices, and county offices. Technical issues are important and critical, but can be easier and better resolved when a framework for collaboration is already in place.

**County Data Sharing**

Many counties feel that they only find out about Mn/DOT activities when a surveyor or lawyer comes to the county administration requesting information. Mn/DOT employees who took care and time to maintain relationships with county staff had a much easier time collaborating with counties. The need and importance of these relationships suggest they receive more incentives for staying involved with relevant county staff and activities.

**Division of Responsibilities**

Outside the metro area, with its own special circumstances, governmental responsibilities for cadastral information are allocated in many different ways. In all counties a surveyor, assessor, and auditor share responsibilities. Depending on a number of other tangible and intangible factors, the registrar and recorder may also be important offices that Mn/DOT staff interacts with. In smaller counties, a single individual may even take on several responsibilities.  In most cases, the responsibilities are shared in a partially legal, but also partially arbitrary fashion among the individuals. Each county, as participants highlighted, is a unique case, necessitating personal and flexible engagement with a good sense of local administrative concerns.

**Accuracy and Errors**

When aerial imagery has been available, it has been very helpful for county surveyors by helping improve accuracy, e.g., by showing occupation lines. It also helps in detecting gaps in the surveys. To often "good enough" data for particular needs is collected which leads to recollection for uses that demand higher accuracy. The use of COGO for surveying should be promoted and support (education and financial) offered to agencies who use COGO to collect data or improve existing data.

**Counties without Digital Data**

Many counties lack digital parcel data. There is an opportunity for Mn/DOT to improve the cadastres in large areas of the state and help create maintenance standards that will ensure high quality cadastral data. It would also helpful to guide data sharing policy and cost recovery mechanisms across the state. Further, Mn/DOT involvement can help improve the relationships between Mn/DOT and these counties.

## Focus Group Meeting Summary

The focus group discussions centered on the need for improved relationships within Mn/DOT and externally to help address the technical problems of sharing ROW cadastral data that are inextricably caught up in administrative issues and changes. This involves formal and informal coordination and sharing, support for counties without digital data, and support of Mn/DOT personnel who must create and maintain the many relationships to counties and municipalities. Benefits were seen by focus group participants by enhancing the attention paid to Mn/DOT formal and informal coordination activities. In a brain-storming session these issues generated some specific ideas. Some have been already tried, e.g., a unified Public Land Survey System (PLSS) corner database, and were not successful. Specific ideas discussed were:

- Central repository of PLSS data
- Requiring the filing of certificates of survey
- Improved formal relationships with counties
- More interactions between surveyors from different agencies
- Development of the SPMI into a basic reference for agency coordination (Who to contact, what data is available, what is the accuracy of available data, who conducted surveys in a particular area.)
- Incentives for municipalities and counties to meet Mn/DOT standards
- Statewide guidelines for cadastres
- Educational workshops
- Developing partnerships for parcel data collection

These ideas were seen to be important emphases for broadly understood educational activities, which would support strengthening interactions among municipalities, counties, state government, and Mn/DOT.

# Chapter 4
# Results

The underlying common need of Mn/DOT staff and government agencies interviewed, surveyed or participated in the focus group is for parcel data developed to survey accuracies. The formats, accuracies, and timeliness of the survey information, however, vary. Coordination is necessary at all levels to assure the common needs are supported. This is intrinsic to any improved support and definition of common needs.

The largest barrier identified in this research is communication barriers. Limited access to information technology, lack of funds, and varying responsibility for cadastral information are considerable issues, but have always been resolved when the communication worked between participating groups. Enhancing the role of the SPMI for coordination and strengthening the presence of Mn/DOT surveyors in county and municipal government seem vital to addressing the high variability and complex, often personality-orientated, organization of local governments across the state.

Technical issues figure largely as well, but always require organizational solutions. Successful implementation of standards depends on improved coordination. This is because although the standards are largely technological, they require organizational change. Needless to say, technological improvements and use of standards involve an increase in costs, which municipalities and counties are often unable to bear without clear rationales, demonstrated cost-savings, and coordination.

# Chapter 5
# Recommendations

The following presents the recommendations of this research in terms of the project's objective: determination of workable solutions for Mn/DOT.

During the focus group meeting the closing discussion specifically took up this objective. A three-pointed model with organizational issues, technical issues, and larger policy/political issues was developed by the group. These points suggest important dimensions that any workable solution must engage.

The first of these points is organizational issues. Here the centrality of informal relationships with county staff highlights the need to assure that Mn/DOT has the necessary time and support to stay in touch with counties. The anecdote offered by one focus group participant about bringing bagels to a meeting with county staff and the resulting goodwill and trust for current and future projects points to the significance of small efforts that make huge differences. These informal relationships cannot and should not replace formal coordination, but can play a very significant role in maintaining and crafting new coordination activities.

The second point centers on technical issues. Clearly, the low accuracy of much parcel data and the low number of counties filing all new surveys are technical issues that need addressing. This can be aided by sharing higher accuracy survey material prepared by Mn/DOT with the county or municipal surveyor, but this solution still would only result in a thicker patchwork of higher accurate surveys, rather than systematic improvements.

The third point focuses on larger policy/political issues. Systematic technical improvements need to be anchored into surveyor training and liaison efforts between state government agencies and local government agencies. Education at all levels of state and local government about the importance of up-to-date cadastral data and materials is critically important for governments to undertake measures to improve their own practices. Finally, revisiting the proposed Land Records Modernization (LRM) program in regarding to Mn/DOT needs, as well as broader state and local government benefits and support, could take on an important role in coordinating Minnesota government cadastral activities and benefiting the whole state.

# References

1.  Minnesota Department of Transportation Office of Land Management (Internet), *2004 Annual Report*, 2004 (cited March, 2005), http://www.olmweb.dot.state.mn.us/Forms___Publications/Publications/Annualreport/annualreport04_files/frame.htm.

2.  Minnesota Department of Transportation Office of Land Management (Internet), *2004 Minnesota Statewide Parcel Mapping Inventory (SPMI)*, 2004 (cited March, 2005), http://www.lmic.state.mn.us/chouse/SPMI/Reporting/index.htm.

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**Appendix A**

**Interview questions**

# Interview Questions
**Enhanced Coordination of Cadastral Information**
Francis Harvey and Becky Vick, October 2004

**Introduction**

This interview is part of a research project examining institutional obstacles to the coordination of cadastral information. Goals of the project include the definition of common needs and relationships, identification of restrictive barriers to collaboration, and determination of workable solutions.

In this interview we would like to ask you some questions about your county's/municipality's/agency's work with parcel information and coordination activities with other government offices and agencies. If you cannot answer based on your work, please answer based on your experiences.

**General Questions**

1. Can you please give us some general information about parcel-related activities in your county or municipality?
    a. How many parcels exist?
    b. How are parcel descriptions collected and stored?
    c. On average, how many new parcels are created each year?
        i. What is a typical lag time for incorporating new information regarding newly created parcels?
    d. How many staff work full-time and part-time on parcel data?
    e. Can you provide a breakdown of revenue and expenses related to the upkeep of parcel data?
2. Are you aware of the SPMI (State Parcel Mapping Inventory)?
    a. Have you used the SPMI?
    b. How have you used it?
    c. Was it useful?
        i. What do you think would improve it?

**Specific Cadastral Questions**

3. How do you keep and maintain data associated with the parcel boundaries?
    a. Is it all in a digital format? What percentage is in digital format? Which format or software do you use?
    b. Do you have the ability to save files in Microstation .dgn format? Or do you use other formats (for example, Autocad .dwg or .dxf)?
    c. Is it clear how each parcel was originally defined?
        i. If the boundaries of a particular parcel have been updated at any point over the years is there record of the changes? In other words, can the historical trail of all documents related to one parcel be found with ease?

d. Which types of data do you maintain and for what percent of the parcels?  If not your department, do you know what agency does?
      i. Line work- proper boundary ownership
      ii. Basis for line work - metadata
      iii. Documents attached to parcels
          1. Warranty deeds
          2. Easements Road/utilities
          3. Encumbrances
          4. Liens
          5. Surveys
          6. Leases

4. Are lost corners a big issue in your county/municipality/agency?
   a. Can you describe the extent of the problems you face with lost corners?
   b. How do you deal with lost corners?

5. Does your county utilize Mn/DOT geodetic control monuments? In what capacity are they referenced?  How are/were these coordinates acquired?

6. Do you coordinate plat books with other parcel documents? {questions a and b are for digital data only)
   a. Does your county keep digital images of documents like deeds, titles, etc?  Are they digitally linked to digital parcel maps in any way?
      i. How are they linked?
   b. Does you budget allow for improvements to digital parcel line work and/or the coordination of parcel legal documents?
   c. Are there any future plans to improve the coordination of parcel line data/maps with associated legal records, like titles, deeds, encumbrances, etc. within your county?  How will coordination be improved?

7. Do you have an easy way to tell which parcels have been surveyed?  Does your county require that all newly partitioned parcels be surveyed?  Does your county require new survey info be filed with the county?

8. Do you have the ability to produce a report that would include all parcel IDs within certain coordinates?

9. Does your county have any plans to improve the state of old data?

10. What are the accuracies of your parcel line work (digital and non-digital)?
   a. Is it less than one foot?
      i. Do you know precisely to one hundredth of a foot?
   b. Is there a range of accuracies?  Is the accuracy of each boundary depiction known?

11. How was your digital line work derived?  For example, was it digitized or was it computed using COGO to make it coordinate correct?
   a. What datum and coordinate system does your county/municipality/agency use for parcel files?
   b. Has digital line work been reconciled with data from the field (such as recovered property monumentation or evidence of occupation lines)?
   c. Can you tell us what is included in your computer aided design (CAD) work (for example,  found monumentation, recorded verses measured distances and directions, evidence of occupation)?
      i. Can this info be turned on or off?

**Data Sharing Questions**

12. Do you currently share parcel information with other agencies and offices?
    i. If so, how (formats and media) and with whom?
    ii. Do you have a web site from which your county's/municipality's/agency's parcel data can be shared?
    iii. Are there ways to connect directly to your county's/municipality's/agency's database to examine line or polygon work?
    b. Are there any charges for accessing and/or using shared information?
    c. Are there any limitations on re-use?
    d. Why do you share cadastral data?
13. Who are your most significant cadastral data-sharing partners?
    a. Do you plan to share more information?
    b. Would you like to share more parcel information?
    c. Would your county be willing to add extra fields to your parcel databases in efforts to improve data sharing with other agencies?
    d. What factors hinder the sharing of parcel information?
    e. What differences in data definitions and standards need to be overcome for successful information sharing?
    f. What federal/state support would be helpful in developing your data-sharing activities?
        i. Would a coupling of support with expectations regarding information sharing be acceptable?
        ii. Do you know about GIS metadata?
            1. Do you currently use GIS metadata?
14. In your estimation, do you think that your jurisdiction's administration would support an open data-sharing policy, or would they require restrictions and charge fees?
    a. Via what channels of authority can a new standard or agreement for data sharing be approved and implemented in your county/municipality/agency?
15. Are you familiar with the different types of land data that Mn/DOT can provide to outside entities?
16. Have you ever shared or acquired data from Mn/DOT?
    a. If so, what kind of data?
    b. How did you acquire it?
    c. Was it an easy / convenient process?
17. Would it be helpful to acquire more data from Mn/DOT?
    a. If so, what kind of data?
18. Would it be helpful if Mn/DOT provided something like a web site that contained information regarding current right-of-way projects in your county?
19. Are there any other thoughts you have regarding cadastral information coordination that you wish to share?

Thank you very much for your time and assistance. Do you have any questions for us?

# Appendix B

# Survey questions

# Enhanced Coordination of Cadastral Information

Francis Harvey and Becky Vick, December 2004

**Introduction**

This survey is part of a research project examining institutional obstacles to the coordination of cadastral information. Goals of the project include the definition of common needs and relationships, identification of restrictive barriers to collaboration, and determination of workable solutions.

In this survey we would like to ask you some questions about your county's/municipality's/agency's work with parcel information and coordination activities with other government offices and agencies.  The results will be kept anonymous.  If you cannot answer based on your work, please answer based on your experiences.

---

For tracking purposes, please indicate the name of your county, office, or municipality: _____

*This sheet will be destroyed after receipt of your survey.*

---

*Contact Info:*

*If you have questions about the survey please contact Becky Vick at:*
*Vick0060@umn.edu*
*Or call her at:*
*612-722-2095*

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*Please return completed surveys to:*

*University of Minnesota Department of Geography*
*ATTN: Becky Vick*
*Room 414, Social Sciences Building*
*267 - 19th Avenue South*
*Minneapolis, MN  55455*

*Or fax to Becky Vick at the University of Minnesota:*
*Fax: 612/624-1044*

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# Survey Questions

## General Questions

1. In which county/municipality office do you work? Which offices in your county/municipality do you coordinate parcel information with?

| Office | Work in? | Coordinate with? |
|---|---|---|
| Assessor | ☐ | ☐ |
| Auditor | ☐ | ☐ |
| Recorder | ☐ | ☐ |
| Registrar | ☐ | ☐ |
| Surveyor | ☐ | ☐ |
| Other: _____ | ☐ | ☐ |

2. Which of the following parcel documents does your office maintain?

| | | | % in paper format | % in Digital Format* | Type of digital Format |
|---|---|---|---|---|---|
| Deeds | ☐ | | | | |
| Titles | ☐ | | | | |
| Easements | ☐ | | | | |
| Encumbrances | ☐ | | | | |
| Liens | ☐ | | | | |
| Leases | ☐ | | | | |
| Plats | ☐ | | | | |
| Surveys | ☐ | | | | |
| Other | ☐ | _____ | | | |

\* Example digital formats are: shp, dxf, dwg, dgn

3. Please give us some general information about parcel-related activities in your county or municipality:
   a. How many parcels exist? _____
   b. On average, how many new parcels are created each year? _____
   c. How are in-coming deeds collected and stored?
      ☐ Paper only
      ☐ Digitally
      ☐ Combination of paper and digital
   d. What is a typical lag time in your department for entering in-coming parcel information?
      ☐ One day
      ☐ One week
      ☐ One month
      ☐ More _____

*Page 1*

e. How many staff work full-time and part-time on parcels?
    i. Assessor/auditor_____
    ii. Recorder_____
    iii. Surveyor_____

4. Please indicate how your county/entity organizes the offices of auditor and assessor.
   - ❑ Auditor and assessor offices are separate.
   - ❑ Auditor and assessor offices are combined

5. If you represent a county, please indicate the responsibilities of your assessor, auditor, and recorder:

| Office | Function |
|---|---|
| Assessor | |
| Auditor | |
| Recorder | |

6. Are you aware of the SPMI (State Parcel Mapping Inventory)?
   - ❑ Yes
   - ❑ No
   a. Have you used the SPMI?
     - ❑ Yes
     - ❑ No
   b. Was it useful?
     - ❑ Yes
     - ❑ No

**Cadastral Questions**

**For questions 8 and 9 please indicate below if your responses apply to the entire county/entity or just the office in which you work.**
   - ❑ **Entire county/entity**
   - ❑ **Just my office**

7. What percentage of your parcel line work is in digital format? _____
   *If you do not maintain digital parcel data please skip to question 9*

***Page 2***

8.  Which format or software do you use for parcel line work? _____
    a.  Do you have the ability to save files in Microstation .dgn format?
        ❑ Yes
        ❑ No
    b.  Is it clear for each parcel boundary how it was originally defined?
        ❑ Yes    How? _____
        ❑ No
    c.  If the boundaries of a particular parcel have been updated at any point over the years is there a record of the changes?
    ❑ Yes
    ❑ No
    d.  Which types of data do you maintain and for which percent of the parcels?
        i.   Line work- proper boundary ownership      _____%
        ii.  Basis for line work – metadata            _____%

9.  Are lost corners a big issue in your county/municipality/agency?
    ❑ Yes
    ❑ No
    a.  If yes, what plans/activities are in place to deal with lost corners?

    _____

    _____

    _____

10. Does you county utilize Mn/DOT geodetic control monuments?
    ❑ Yes
    ❑ No

11. Do you coordinate parcel documents with other county/municipal offices?
    ❑ Yes
    ❑ No

12. Does the department coordinate parcel maps/line work with parcel documents, (e.g., deeds, etc)?
    ❑ Yes
    ❑ No
    a.  Are there any future plans to improve the coordination of parcel line work/maps with associated legal records, like titles, deeds, encumbrances, etc. within your county?
        ❑ Yes
        ❑ No

*Page 3*

i. If yes, please describe these plans:

_____

_____

b. Does your county keep digital images of documents like deeds, titles, etc?
- ❑ Yes
- ❑ No
  - i. Are any of them digitally linked to digital parcel maps?
    - ❑ Yes
    - ❑ No
      1. If yes, how are they linked? _____
c. Does your budget allow for improvements to digital parcel line work and/or the coordination of parcel legal documents?
- ❑ Yes
- ❑ No

13. Do you have an easy way to tell which parcels have been surveyed?
- ❑ Yes
- ❑ No
  - a. Does your county require that all newly split parcels be surveyed?
    - ❑ Yes
    - ❑ No
  - b. Does your county require new survey info be filed with the county?
    - ❑ Yes
    - ❑ No

14. Does your county have the ability to produce a report that would include all parcel IDs within certain coordinates?
- ❑ Yes
- ❑ No

15. Does your county have any current projects or future plans to improve the state of old parcel data?
- ❑ Yes
- ❑ No
  - a. If yes, please describe: _____

_____

_____

16. What are the accuracies of your parcel line work (digital <u>and</u> non-digital)?
- a. Is it always less than one foot?
  - ❑ Yes
  - ❑ No

*Page 4*

b. Is there a range of accuracies?
- ❑ Yes - range: _____
- ❑ No

c. Is the accuracy of each boundary depiction known?
- ❑ Yes
- ❑ No
- ❑ Sometimes

17. How was your digital line work derived?
- ❑ Digitized
- ❑ COGO
- ❑ Both
- ❑ Other: _____
  a. What datum and coordinate system does your county/municipality/agency use for parcel data? _____
  b. Has digital line work been reconciled with data from the field (such as recovered property monumentation or evidence of occupation lines)?
    - ❑ Yes
    - ❑ No
    - ❑ Sometimes

**Data Sharing Questions**

18. Do you currently share parcel information with other agencies and offices?
- ❑ Yes
- ❑ No
  a. If yes, with whom and how?

| Sharing Partner/Recipient | Format (e.g., dxf, shp, dgn) | Media (e.g., CD, ftp, email) |
|---|---|---|
|  |  |  |
|  |  |  |
|  |  |  |

*For each sharing partner/recipient please enter all the different formats and media used.*

  b. Do you offer data subscriptions to outside entities?
    - ❑ Yes
    - ❑ No
      If yes:
      i. How many digital data subscribers do you currently have? _____
      ii. How many non-digital data subscribers? _____
      iii. How many digital/paper combination subscribers? _____ _____
  c. Do you have a web site from which your county's/ municipality's / agency's parcel data can be shared?
    - ❑ Yes
    - ❑ No

*Page 5*

   i. If yes, is the web site publicly known and available?
- ❑ Yes
- ❑ No
- ❑ Sometimes

   ii.  Are there ways to connect directly to your county's /municipality's/ agency's database to examine line or polygon work?
- ❑ Yes
- ❑ No

 d. Are there any charges for accessing and/or using shared information? Yes/no
   i. If yes, please explain or attach additional information:

_____
_____
_____
_____
_____

 e. Are there any limitations on the re-use of shared data (*indicate all that apply*)?
- ❑ Distribution
- ❑ Sale
- ❑ Publishing
- ❑ Other _____

 f. Why do you share cadastral data *(please indicate all that apply)*?
- ❑ Benefits for community
- ❑ Benefits for agency
- ❑ Other: _____

19. Do you plan to share more information?
- ❑ Yes
- ❑ No

20. Would your county/municipality be willing to add extra fields to your parcel databases in efforts to improve data sharing with other agencies?
- ❑ Yes
- ❑ No

21. What factors hinder the sharing of parcel information *(please indicate all that apply)*?
- ❑ Cost
- ❑ Formats
- ❑ Compatibility
- ❑ Accessibility
- ❑ Authority
- ❑ Other: _____

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22. What federal/state support would be helpful in developing your data sharing activities?
    - ❑ Financial support
    - ❑ Standards
    - ❑ Training/Education
        a. Would the linking of support to expectations regarding information quality and sharing be acceptable?
            - ❑ Yes
            - ❑ No

23. Do you know what GIS metadata is?
    - ❑ Yes
    - ❑ No
        a. Do you currently create GIS metadata?
            - ❑ Yes
            - ❑ No
        b. Do you use a standard format?
            - ❑ Yes
            - ❑ No
        c. If yes, which format: _____
        d. Do you rely on metadata from other organizations' data files?
            - ❑ Yes
            - ❑ No

24. In your estimation, do you think that your jurisdiction's administration would support an open data-sharing policy, or would they require restrictions and charge fees?
    - ❑ Open data sharing
    - ❑ Restrictions and fees

25. Via what channels of authority can a new standard or agreement for data sharing be approved and implemented in your county/municipality/agency?
    _____
    _____

26. How would you characterize the overall relationship between your department and Mn/DOT?

    - ❑ Positive
    - ❑ Negative
    - ❑ N/A

27. Have you ever acquired data from Mn/DOT?
    - ❑ Yes
    - ❑ No
        a. If so, what kind of data? _____
        b. How did you acquire it? _____

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 c. Was it an easy / convenient process?
   ❑ Yes
   ❑ No

28. Would it be helpful to acquire more data from Mn/DOT?
  ❑ Yes
  ❑ No
  a. If so, what kind of data? _____

29. Would it be helpful if Mn/DOT provided something like a web site that contained information regarding current right-of-way projects in your county?
  ❑ Yes
  ❑ No

30. Are there any other thoughts you have regarding cadastral information coordination that you wish to share? _____

_____
_____
_____
_____
_____


**Thank you very much for your time and assistance!**

**Appendix C**
**Notes on Survey Interpretation**

## Survey Mailing

106 surveys total were mailed in the last week of December, 2004 to 87 Minnesota counties, 11 Indian Reservations, 6 municipalities and 2 national forests. The source for contact information of survey targets was the 2004 Minnesota Statewide Parcel Mapping Inventory (SPMI) database. The database was provided to us by Jay Krafthefer at Mn/DOT. Survey targets' roles varied and included county assessors, surveyors, recorders, planners, GIS professionals, and city engineers. . Each mailing included one survey and one self-addressed stamped envelope. After approximately two weeks, a reminder e-mail was sent to those for whom we had valid e-mail addresses. Shortly thereafter, follow-up phone calls were made starting with those who had not received a reminder e-mail. Most follow-up calls resulted in leaving a voicemail or speaking directly to the contact. Some contacts who were reached during the follow-up process said that a different county professional would be more apt to complete the survey for reasons such as lack of time or feeling they could not answer the questions adequately. These contacts either said they would pass the survey on themselves or provided us with a new contact name, phone number and/or e-mail.. In the later case we would then send a survey to the new contact. Most completed surveys were received through the mail, five were conducted via e-mail, and about five conducted over the phone. After approximately two-to-three reminder phone calls, attempts to receive the completed survey were abandoned. All surveys included in final analyses were received by February 20th, 2005.

## Survey Processing

68 surveys were received out of 106 mailed. The total N (including missing responses) of most tables in the appendix is 68 with the exceptions of parts of Q1 and Q2 and some multiple response questions, which were based on subsets of the total group. The questions for which the respondent could check more than one option are labeled in the appendix with the header "Multiple Response". In these tables the "percent of cases" is based on the number of "valid cases", which is provided below the table (a case is valid if the respondent checked at least one option). Responses to open-ended questions were coded into appropriate categories with the exception of Q30, which was transcribed.

## Note on Interpreting the Data

One survey target had done an interview with us and was not willing to fill out the survey as well. 38 surveys total were not returned. Possible reasons:

 1) Survey targets are over surveyed. People working in local government on GIS issues apparently receive a number of surveys each year.

2) Surveys were mailed around the beginning of the year. Many survey targets who were reached during the follow-up phase said that it was a very busy time of year.

3) The questions covered a wide range of areas requiring a lot of knowledge, which may have caused the survey to be set aside or passed on to another person eventually getting lost somewhere in the organization.

4) Some Indian Reservations and national forests may have felt that most questions did not apply to them so therefore did not respond at all.

Many questions have missing responses.

Possible reasons:

1) The respondents were varied in their positions and may not have known answers to all questions so opted to answer only those they could answer without consulting colleagues.

2) The target organizations included counties, municipalities and Indian Reservations which leads to varied and unique situations.

3) The questions covered a wide range of areas, which requires a lot of knowledge.

Below are a few specific things to think about when interpreting data from certain questions:

Question 18:  Some surveys had hand-written notes that implied that the respondent took "sharing data" to mean the two-way transfer of data with another agency, or an agreement where their county provides data for free.  For example one respondent checked "no" and wrote "data is sold - no data sharing currently takes place."  It is also possible that some respondents thought the question was asking about digital parcel data only because of the example formats we provided.

Question 18d: It was difficult to capture the greatly varied responses into codes.  Only one respondent attached additional information on their data-charging scheme.

Questions 18e-f:  Many respondents left this question blank.  A survey design flaw is that there is nowhere to check "no limitations" or "none of the above."  If left blank it is not clear if the respondent meant to say "no limitations" or if they did not wish to answer the question.

As with any survey some questions may have been interpreted differently by different respondents.  Questions with a larger N (number of responses) are more reliable.

**Hand-written Comments**

There are many examples of hand-written notes that spoke to how many counties are currently in the midst of making significant changes to their technological capabilities in regards to parcel data (e.g. a hand-written response to question 18b was "To be implemented within next 6 months"; a response to 18c was "Component to be added shortly").

**Appendix D**

**Survey Respondent Suggestions**

**Responses to Survey Question 30, "Are there any other thoughts you have regarding cadastral information coordination that you wish to share?"**

| Case | Response |
|------|----------|
| 1 | For the most part we do not have sufficient need for extremely tight control. Our parcel maps are for general information only. Our highway department is the only department that has expressed the need for greater accuracy and they do their own survey/control work per project – and would even if our accuracy was higher. Therefore it is hard to justify additional expense to improve it. We are making improvements over time as our workload allows. |
| 7 | Reservations are a different creature than counties/cities. Most land is in trust with the Federal government and thus tax exempt. Since counties can't tax it, they are not always interested in these parcels. The Feds (BIA-Bureau of Indian Affairs) maintain the deeds and Indian ownership. The counties don't know the contents of these deeds, and may not know how to contact the BIA title plants. Then there are open and closed reservations. Red Lake is closed and Fond du Lac is open. Open means that non-band members can own land within the reservation borders. I am drawing digital parcels for Carlton and St. Louis Counties and Federal Reservation and City of Cloquet of all parcels within the boundaries. Carlton County and Cloquet do not have or use GIS for parcels (they have it for forestry or it is …?). St. Louis County will maintain the parcel maps once I create them. |
| 8 | My biggest desire in a perfect world would be that every county use the same software programs etc. so we would be uniform in our data collection and distribution and we could have our own support from within instead of every county going in their own direction. |
| 9 | Would like to see county progress to provide parcel data information online- hope to be available by end of 2005. |
| 14 | Cadastral data sharing is an extremely important (security/economy) topic. Our county is not in the position to provide much data at this point. We should have a completed cadastre in 12-18 months.<br><br>It appears a line needs to be drawn between public and private sharing of data and the costs associated (fees) with each. |

| 17 | I don't fully understand the need for sharing parcel data with other public agencies. I see parcel data as a very valuable "in-house" tool that should be kept "in-house". If agencies need information from parcel data, (it) can be requested and products delivered without having to share the digital data. There is too much potential for misuse of this kind of data. If Mn/DOT wants to know parcel ownership adjacent to a given highway, that information can be obtained by contacting the county in which the highway (exists). If that county has parcel mapping that information can be provided very easily. Whenever I receive a request for digital parcel data I inquire as to what or how it is going to be used. It always ends up where I do what the data requestor wants at a much lower cost and less hassle as far as license agreement, etc. |
|---|---|
| 23 | Lake County has GIS only in the assessor's office – with a part-time staff person. |
| 24 | 1) Funding is needed at the county level –where the data resides, for development and maintenance. <br> 2) State offices need to work on communication with counties in general regarding data availability and sharing back and forth <br> 3) Standards- clear and easy-to-comprehend should be shared between ALL levels of government so that data sharing will work and work well. |
| 26 | Funding is the key, along with the Registered Land Surveyors doing their jobs with PLS corners and certificates. |
| 31 | Our county has not dedicated a great amount of time and money to GIS data collection and retrieval. We are going to spend time in 2005 exploring our options. We have been slow to adopt a full-scale solution due to money constraints. |
| 30 | The survey is mostly incomplete - we do not have a cadastral mapping system so we have nothing to tie data to. I am sure we can work through institutional barriers when we have a system to work with. |
| 60 | We are willing to share. Fees are necessary to cover costs. |
| 61 | The Governor needs to provide LIDAR for the entire state – good for DEMs [Digital Elevation Models], emergency planning and floodplains. |
| 62 | Most counties in West Central Minnesota are happy to share data with other governmental agencies. We like to see it both ways (data sharing). |
| 65 | Data sharing is a boon to economic development. <br><br> City –level data needs to be more accurate than most county-level data. Also, census data (like tiger files) is not even accurate enough sometimes at city level. <br><br> More charges/fees means more liability, which is why we don't charge for data. |

| | |
|---|---|
| 67 | We get all of our parcel data from Becker County.  We used to have them send us data or hard copies of documents and we would update our parcel map ourselves.  But now that Becker County has an online system where we can get the data it has become faster for us to use that and we just wait for them to do the updates.<br><br>Counties need more financial support.  Cities need county data for areas that are peripheral to our city. |
| 68 | All of this data has already been provided to LMIC through the SPMI. |

# Appendix E

# Focus Group Preparation

# Memo

March 3, 2005

To: Focus Group Meeting Participants

From: Francis Harvey, fharvey@umn.edu

Subject: Focus Group Meeting Background, Preliminary Survey Evaluation, and Issue for Focus
   Group Meeting

## Background

In the project, **Enhanced Coordination of Cadastral Information,** the focus group meeting
serves to discuss findings from the interviews and surveys.

This project examines **intra-governmental** Mn/DOT cadastral information sharing activities and
policy and **inter-governmental** cadastral sharing activities and policy involving Mn/DOT and
federal, state, regional, local, and tribal governmental agencies.

The survey and interview instruments used in this research, for both Mn/DOT offices and other
government agencies, identify institutional issues including the definition of common needs and
relationships, identification of restrictive barriers to collaboration, and determination of workable
solutions for Mn/DOT.

During the focus group meeting participants will discuss the results of the interviews and surveys
and possibilities for solving cadastral information sharing issues identified in the project.

## Preliminary Survey Evaluation

Building on results of interviews held with seven agency representatives, the survey consisted of the same core questions, with some clarifications and additions. Clarifications were also made to the final survey instrument based on Technical Advisory Panel (TAP) comments to the draft instrument. The interviews suggested that cadastral information-sharing activities were predominantly informal and that the division of responsibilities for cadastral information is divided among several county agencies.

The survey raised questions in three domains:

- General
- Cadastre
- Data Sharing

**General** questions covered the respondents parcel related work activities, office, and knowledge of the SPMI. **Cadastral** questions addressed issues related to surveying of parcels, use of technology, and other characteristics of their cadastral information. The **Data-Sharing** questions raised issues about current and future cadastral information sharing activities and collaboration with Mn/DOT.

The following parts of this menu provide a tentative summary of survey findings as the basis for discussion at the focus group meeting.

## Evaluation Overview

By February 20th, we received 68 out of the 106 surveys distributed in mid-December. The survey responses confirmed our evaluation of the interviews, but made clear that the one of the main hindrances to cadastral information sharing is simply not having digital data; 23% of the respondents have no digital data. While this result corresponds to the SPMI 2004 results, considering the interview and survey responses makes it clear that the creation of digital cadastral information in one county or municipal office is often limited to that office alone. In other words, the split of cadastral functions among assessor, auditor, recorder, registrar, surveyor, and possibly GIS, means that the digitization of information is often only for a particular function and mandate. The recorder, who not only records deeds etc, but also distributes parcel-related information, usually lacks digital cadastral information.

Table 1.  Response Rates

|  | Sent | Returned | Percent |
|---|---|---|---|
| County | 87 | 61 | 70% |
| Municipality | 6 | 4 | 67% |
| Indian Reservation | 11 | 3 | 27% |
| National Forest | 2 | 0 | 0% |
| Total | 106 | 68 | 64% |

Currently, plat books sold by secondary publishers occupy an important niche in disseminating cadastral information. Inter-governmental cadastral sharing activities are impaired by the lack of a mandate requiring coordination among local government offices. In this environment, informal cadastral information sharing becomes the most functional means for data sharing and also makes it possible for Mn/DOT staff to obtain assistance beyond the possibilities of formal data sharing arrangements.

## Evaluation of General Questions

Perhaps the most significant question for the focus group meeting deals with coordination.

> 1. In which county/municipality office do you work? Which offices in your county/municipality do you coordinate parcel information with?

A matrix relating the respondents' work office to the other offices reveals the following:

- assessors coordinate mainly with auditor and recorder, only limited coordination with surveyor
- auditors coordinate with assessor, very limited coordination with surveyor
- recorders coordinate with surveyor mostly
- registrars coordinate with surveyor
- surveyors coordinates with all

Because of the small number of responses to this question, these results should be considered carefully. Taking into consideration the interviews, we suggest that the assessor occupies the most significant role in the surveyed local governments. This has important consequences for cadastral information sharing.

The importance of the assessor shows itself in the result that .tiff and .shp formats are the most common in respondents with digital information. Almost 30% of the respondents stored data in .tiff format; 25% in .shp format.

Regarding the SPMI, it is interesting to note that: 54% of the respondents indicated they are aware of the SPMI; 39% indicated no awareness of the SPMI; 15% said they used the SPMI; and 12% said it was useful. However 80% of the respondents left this question blank.

## Cadastral Questions

As indicated earlier there is a clear bifurcation between respondents with 100% digital linework (50%) and 23% with no digital linework. In between, most of the respondents cluster around having 30-50% of their linework in digital format. This is backed up by the 49% of respondents

who indicate they could provide a list of parcel IDs for an arbitrary geographic area—a common GIS-based function. Given the comments of many respondents referring to their dynamic projects that are getting underway, we can expect this to change in the near future. Of course, the other local government office may face different circumstances.

In 50% of the responses, .shp format was used; Computer-aided design (CAD) in 21%. Only 66% could provide output in .dgn format. Most respondents cannot say how parcels were defined, but most track changes. Only 41% maintain information on boundary ownership. Lost corners are not an issue for most respondents; only 15% have remonumentation plans.

Most respondents (66%) coordinate parcel documents with other local government offices, but only 50% coordinate parcel linework with other parcel documents (e.g., deeds), even though 82% indicated they store deeds in a digital format. In fact, only 10% indicate they link linework digitally with documents. About the same percent of respondents indicate they plan to improve coordination, mainly through linking databases and 40% said they have projects to improve older parcel data. However, only 32% of the respondents have a budget for improvements. Indeed, only 9% of the respondents indicate they have an accuracy <1 foot and only 6% can determine the accuracy of all parcels. Most of the digital linework has been collected using COGO in county coordinates (37%) without field reconciliation. (18% indicated yes to this question).

# Data Sharing

Most (70%) share cadastral information with other offices, broadly defined.

Table 2: Sharing Partners

| Sharing Partner | | Total Responses | Percent |
|---|---|---|---|
| Public | | | 70 |
| | Municipalities | 18 | 23 |
| | Intra-county | 13 | 17 |
| | DNR | 6 | 8 |
| | Counties | 5 | 6 |
| | State / Federal Gov't. | 5 | 6 |
| | Data Clearinghouses | 3 | 4 |
| | Dept. of Revenue | 2 | 3 |
| | Mn/DOT | 2 | 3 |
| | Farm Service Agency | 1 | 1 |
| Private | | | 24 |
| | Other | 6 | 8 |
| | Realtors / Appraisers | 4 | 5 |
| | Utilities | 4 | 5 |
| | Consultants | 2 | 3 |
| | Private surveyors | 2 | 3 |
| Universities and non-profits | | | 6 |
| | Environmental Orgs. | 4 | 5 |
| | Universities | 1 | 1 |
| | Total | 78 | 100 |

E-mail, CD, and FTP/Web dominate as types of media for data sharing and 34% of the respondents indicate they charge for data, usually following a price scheme. Of the respondents, 32% say they limit the further distribution of data. Only 10% use data subscriptions, but 30% maintain a Web site for data sharing.

24% of the respondents think their jurisdictions support open data sharing; 74% think they would like to collect fees. Most (57%) respondents say they plan to increase data sharing; 16% say they have no such plans; and 26% failed to answer this question. On this issue, 54% indicate that financial support from federal and state agencies would be helpful, followed by training and education (35%), and 29% indicated standards. Authority for data sharing mainly lies with county boards or commissioners.

The most commonly indicated hindrance to data sharing was cost (47%) followed by authority (19%) and compabatibility (16%). Several respondents wrote accuracy is a hindrance. About half of the respondents say they would add another field to their data to improve data sharing. 25% of the respondents failed to answer this question.

Metadata is used by 37% of the respondents; 29% in MGMG and 29% in ESRI formats. Other agency metadata was used by 47% of the respondents.

The relationship to Mn/DOT was positively valued by 66% of the respondents; 67% acquire data from Mn/DOT, mainly ROW linework. Most would like to acquire more of this type of data .

## Focus Group Meeting Issues

For the meeting, the suggestion seems appropriate that we focus on three over-arching issues. First, a discussion of the survey and interview results. Second, the significance of the evaluation. Third, identification of relevant policy issues for Mn/DOT and inter-governmental cadastral sharing activities and policy involving Mn/DOT and federal, state, regional, local, and tribal governmental agencies.

# Appendix F

# Local Government and Cadastre in Minnesota

## County Parcel Roles and Coordination

Generally speaking, the functions of the county assessor, auditor, recorder and surveyor are related to land information through activities related to ownership or taxation. Regardless of county organization, all offices must coordinate the exchange of key documents, but their interpretation and use depend on the regulatory or legislated role of the office, actual division of responsibilities in the county, and administrative relationships. The following discussion focuses on regulatory and legislated roles. Commonplace idiosyncratic aspects of coordination arise from the myriad ways that specific functions and coordination activities are delegated and executed.

The main role of the assessor is to classify and appraise all property subject to taxation within the county's jurisdiction. According to William Craig's 1993 unpublished document "LIS Data and Players in Minnesota - The Central Role of County Government," assessors maintain assessment rolls, which are generally computerized databases that contain tax-class and property values for every piece of property in the jurisdiction subject to the property taxation system. Assessors also maintain field cards, which contain detailed information that affects property value for each individual piece of property, information such as livable square footage and number of bedrooms. Assessors also track sale prices with the use of Certificates of Real Estate Value (CREV), which are primarily received and maintained by the county recorder (see more about the CREV in the paragraph about the recorder below). To aid the valuation and classification process, county assessors must maintain a topographical map that displays objects that might affect land value. They are sometimes maintained by the county surveyor but most often are maintained by the assessor.

Craig's document describes that in Minnesota the county auditor is typically responsible for calculating tax rates and levying taxes. In many counties the county auditor also acts as the county coordinator and leads the overall coordination of tax functions. The assessor and auditor must work closely together to perform their individual tax functions. The auditor provides a tax list to the assessor to which the assessor adds correct property values [2]. Assessment rolls are transferred to the auditor once a year for creating tax bills. In Minnesota, July 1st is the deadline for tax assessments for the year [3]. Further, the auditor must make sure the assessor is not omitting or undervaluing property from the tax list [4]. The auditor also works with the recorder to maintain correct ownership information for the tax list.

The main duty of the county recorder (or registrar) is to maintain documents presented to the recorder that detail transactions or events relating to land rights. Some common ways of indexing is by principle party (e.g. grantor (seller), grantee (owner)) or by location (tract index). Some county recorders also take and file scanned images of documents. The role of the recorder is passive. The county recorder is not responsible for verifying the contents of what is filed [1]. The recorder receives the sales price from the buyer and current appraisal data from the county assessor. These two pieces of information are then put on the Certificate of Real Value CREV by the recorder. Completed CREVS are then sent to the assessor. The recorder also supplies the auditor with current information about property ownership for tax records.

The county surveyor is responsible for maintaining control networks, the most important of which is the Public Land Survey System (PLSS). The county surveyor must maintain PLSS

corner monuments, reestablish them when necessary and verify remonumentation certificates that are filed with the county by private surveyors. These functions are very important to the cadastral systems because all legal parcel (a contiguous area of land ownership) boundaries in most states are tied to the PLSS. The county surveyor is also responsible for overseeing boundary issues related to county-owned land and for performing all court, public board, or officer-ordered surveys. Not all counties employ a county surveyor. A contractor can be hired on an as-needed basis to perform land-surveying duties for which the county is responsible. According to Craig sometimes the county surveyor maintains the tax-parcel map but most of the time this is done by the county assessor. County surveyors also validate subdivision plats submitted by private surveyors and are responsible for sending approved subdivision plats to the county recorder. County surveyors also maintain private survey records. If a county does not employ a surveyor, survey records are maintained by the county recorder (Minnesota State Statute).

According to Craig the county assessor must send Certificates of Real Estate Value (CREV) and the county auditor must send an Abstract of Tax Lists and an Abstract of Assessments to the Minnesota Department of Revenue so that it can evaluate and monitor local taxation.

The diagram below showing the division of roles is adapted from Craig's diagram in his 1993 unpublished document entitled "LIS Data and Players in Minnesota – The Central Role of County Government." The left side of the diagram includes those entities involved with property ownership data. On average, changes to property ownership occur once per decade. The right side includes fiscal players. The width of the lines represents the relative rate of the flow of information between two players per year.
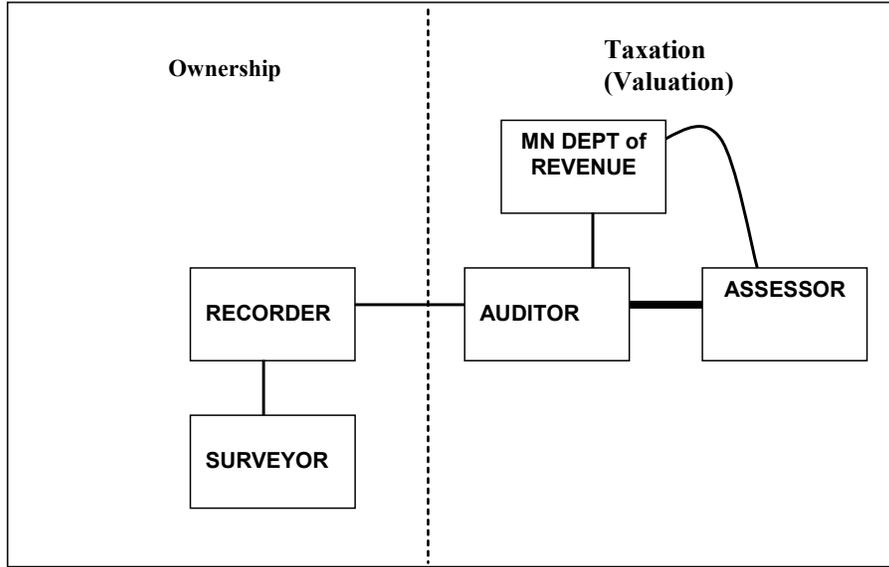
Figure 1: Division of Cadastral Oriented Roles in Minnesota County Government (as adapted from Will Craig's unpublished document "LIS Data and Players in Minnesota – The Central Role of County Government").

**References**

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