Minnesota Department of Transportation (Mn/DOT) Cadastral and Right of Way Data Sharing Pilot Project

Phase 1 and Phase 2 Summary Report

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PHASE 1 AND PHASE 2 SUMMARY REPORT

The *Cadastral and Right of Way Data Sharing Pilot Project* is divided into three phases:

- Phase 1   Identify Information to Share
- Phase 2   Information Collection
- Phase 3   Web-based Information Access and Transfer

The *Phase 1 and Phase 2 Summary Report* documents the process that was followed for both phases of the project, and presents a compilation of the resulting interview information.

Phase 1

Phase 1 included a meeting of the project's Technical Advisory Panel (TAP) to develop and document two lists of valued information.

1. Mn/DOT TAP members list of data valuable to acquire in relation to right of way work.
2. Local government TAP members list of data valuable to acquire in relation to local government work.

The lists of valued information are included as *Appendix A*.

- The Mn/DOT list of information valuable to acquire as it relates to right of way projects includes fifteen (15) items. This list of items was integrated into a Microsoft Access interview form to collect information during interviews, and query information for report purposes. All local government organizations were interviewed to determine the existence of each item, accessibility, contact person(s), data format and accompanying metadata.

- The Local Government list of information valuable to acquire in relation to local government projects includes twelve (12) items. Mn/DOT staff were interviewed to determine the existence of each item, accessibility and format. In addition, local government organizations were asked to rate the importance of each item, and to list any information or data that was valuable but not included on the list.

Secondary lists of valued information that did not relate to right of way projects were also developed by the TAP for Mn/DOT and Local Government (Secondary lists are included as Appendix A). These lists were included in the Local government and Mn/DOT interviews listed above.

Phase 2

Phase 2 involved setting up interviews with pertinent officials and department heads for each of the twelve counties, four cities and the White Earth Indian Reservation. Local government interviewees were selected based prior contact with Pro-West & Associates' consultants and information listed in the Statewide Parcel Mapping Inventory (SPMI) database. Interviews were conducted by personal visits with local government staff and follow-up telephone calls. All valued data lists were discussed with local government interviewees prior to and during interviews. Anecdotal information acquired during the interviews was also documented.

Follow-up meetings will be held with local government organizations as needed, to clarify information or acquire additional information.

Local Government Interview Results

Local government information is collected and stored by different departments and exists in multiple formats, resolutions, accuracies and methods of retrieval. The detailed specifics of the data were collected during interview meetings with local government staff. All the specifics are not listed in this report, but the information has been categorized and graphed to illustrate the ability of Mn/DOT to access the valued information. The data specifics will be utilized in the development of a web application in Phase 3 and the database of details will be included in the final project summary report.

Categories of Data Accessibility

- **Web Enabled**
  All local government organizations either possess the ability to distribute public data on the internet in database, image or mapping format, or the organizations are in the process of developing internet capability. Mn/DOT District 4 is already utilizing the web mapping sites developed and maintained by four (4) counties in the district.

  Local government spatial GIS data, databases and imaged documents that are web enabled will be linked to the Mn/DOT web mapping application without the need to convert data, upload or maintain by Mn/DOT.

- **Subscription**
  Three (3) counties currently allow access to imaged recorded documents via a subscription service. Follow-up meetings will be held with county officials and appropriate departments to discuss data sharing rather than subscription cost for the requested data. Input will be requested from the TAP prior to the meetings and findings will be reported to the TAP following the meetings.

- **Desktop**
  Local government accesses spatial GIS data, databases and imaged documents internally either by internet or desktop software. Desktop software is not accessible on the internet, but requests can be made for digital downloads of the information. The Mn/DOT web application developed in Phase 3 will provide a request mechanism and an upload or email option for sharing the data.

- **By Request**
  Spatial GIS data, databases and documents that are not accessible on the internet will require a request to local government departments. After request, the data could be uploaded digitally, Faxed or mailed to Mn/DOT staff.
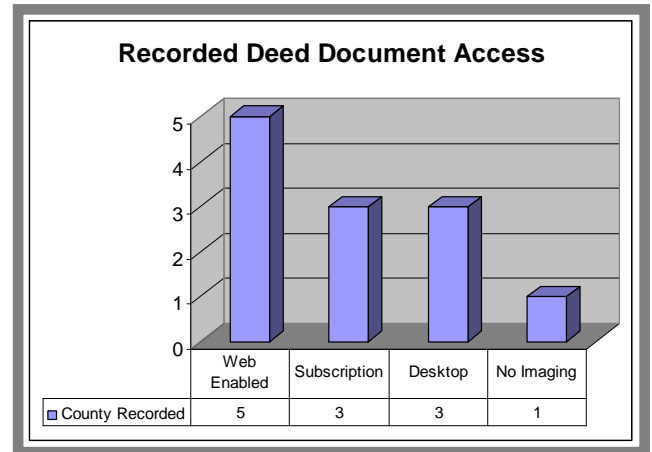
Mn/Dot List of Valuable Data in Relation to Mn/DOT Right of Way Work

The fifteen (15) items *(Appendix A)* that were developed by the project TAP as the Mn/DOT list of data that is valuable to acquire in relation to Mn/DOT right of way work are documented in bar chart form. Details pertinent to the item are documented along with a bar chart that displays categories of accessibility. Details were collected as items in the database interview form and in notes taken during the interviews.

Recorded Deed Document Access

All local government agencies are concerned with recording documents in a timely manner. Legislation was passed in Minnesota in 2004 and enacted beginning in 2005 that sets timelines for recording documents by counties. The legislation will require documents to be recorded within ten (10) days by the year 2011.

This legislation also allowed for counties to collect additional fees for recorded documents that would support developing or enhancing technology to accomplish the mandated recording timelines. As a result, all counties in Mn/DOT's District 4 have technology in place to scan documents into an image format, except Swift County. Swift County plans to begin document imaging in 2008.

Recorded Deed Document Access

	Web Enabled	Subscription	Desktop	No Imaging
County Recorded	5	3	3	1

Recorded documents are scanned and indexed as they are recorded, and older recorded documents are also being scanned going back a varied number of years, depending on the county. All counties have plans in place to continue scanning older documents until all documents have been scanned, as recording fee funds allow.
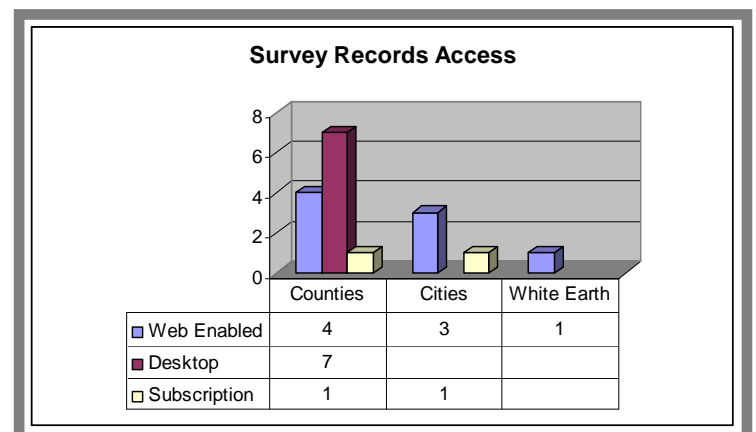
Four (4) major vendors provide document imaging solutions to local government. Each vendor provides a web enabled application for document access. Eight (8) counties utilize the web solution provided by the vendors. Three (3) of those counties require a paid subscription at this time to access documents on the internet. Follow-up meetings will be held with the counties that require a paid subscription to discuss the possibility of data sharing rather than paid subscription.

Recorded document books and manual indexes are still being maintained in addition to scanning recorded documents to image format. If the needed document is not yet imaged it will not be accessible by the internet but will be Faxed or mailed to Mn/DOT upon request.

Survey Records Access

In addition to imaging recorded deeds and mortgages, or other small format documents, some counties are scanning certificates of survey, private certificates of survey and other information related to section corners. These documents are accessed either by web enabled software or are only internal to the county by a desktop application.

The recording of certificates of survey is not consistent among private surveyors. To remedy this situation, Stevens County has waived recording fees to encourage more consistent recording of certificates of survey.

Survey Records Access

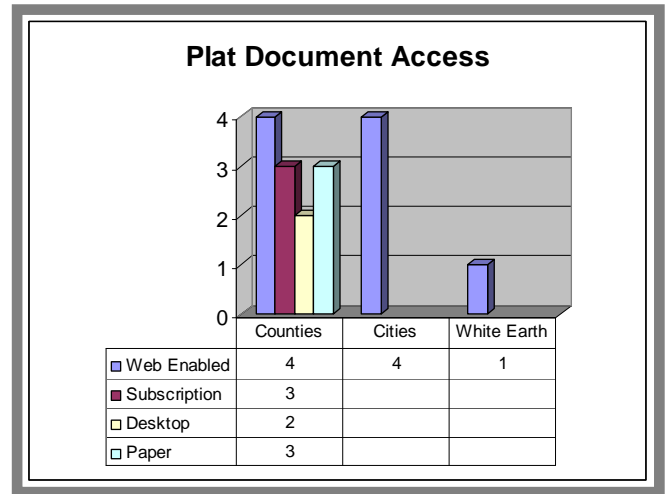|	Counties	Cities	White Earth
Web Enabled	4	3	1
Desktop	7		
Subscription	1	1	

Plat Document Access

Plats are scanned by counties using two methods.
1. Scanned and indexed utilizing image software from 4 major vendors of imaging software (ISC, Tri-Min, Fidlar, CSA).
2. Scanned and indexed in directory format on the county's server.

Both methods allow access via the internet. The obstacle in scanning large paper plats is the need for a wide format scanner.

The counties record and archive all plats for the county, cities and reservations. The White Earth Indian Reservation also scans and archives properties that are classified as band, allotted or White Earth Land Settlement Act (WELSA) lands.

Plat Document Access

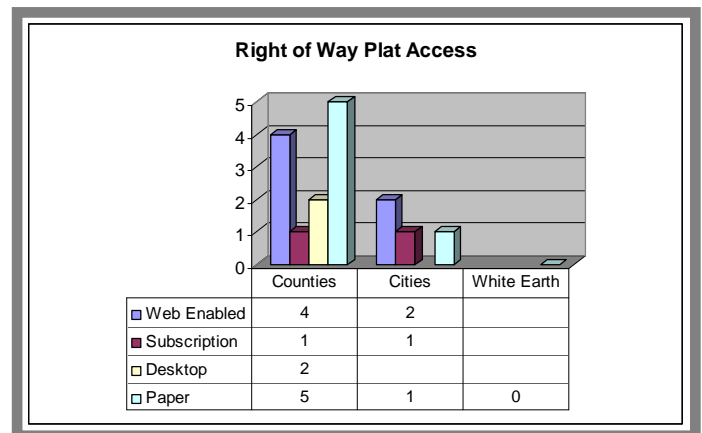|	Counties	Cities	White Earth
Web Enabled	4	4	1
Subscription	3		
Desktop	2		
Paper	3		

Right of Way Plat Access

Right of Way plat information is not as often scanned to image format as subdivision plat information. Scanning right of way plats are also lower priority than scanning documents such as deeds and mortgages. As the County Recorder's offices are able to complete the scan of higher priority documents to image format with recording fees, the right of way plats will be scanned.

Right of way plats are scanned by counties using two methods.
1. Scanned and indexed utilizing image software from 4 major vendors of imaging software (ISC, Tri-Min, Fidlar, CSA).
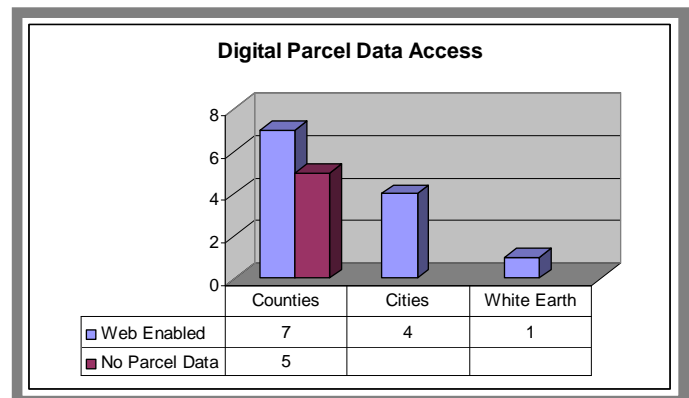2. Scanned and indexed in directory format on the county's server.

Both methods allow access via the internet. The obstacle in scanning large paper plats is the need for a wide format scanner.

Right of Way Plat Access

	Counties	Cities	White Earth
Web Enabled	4	2	
Subscription	1	1	
Desktop	2		
Paper	5	1	0

Digital Parcel Data Access

58% of the local government organizations within District 4 have developed digital parcel data. The data is of varying accuracies, based on the accuracy of the base section corners. All county and city developed parcel data is maintained by the counties, except the City of Fergus Falls maintains its own digital parcel data.

All local government organizations with digital parcel data also have developed a web mapping application to distribute the data on the internet. Of the 12 organizations with digital parcel data, 2 counties (Big Stone and Wilkin) are in the beginning stage of development. The White Earth Indian Reservation developed data as a cooperative venture with Mahnomen County. Metadata is available for the digital parcel data for 6 of the counties, 4 of the cities and the White Earth Indian Reservation.

Digital Parcel Data Access

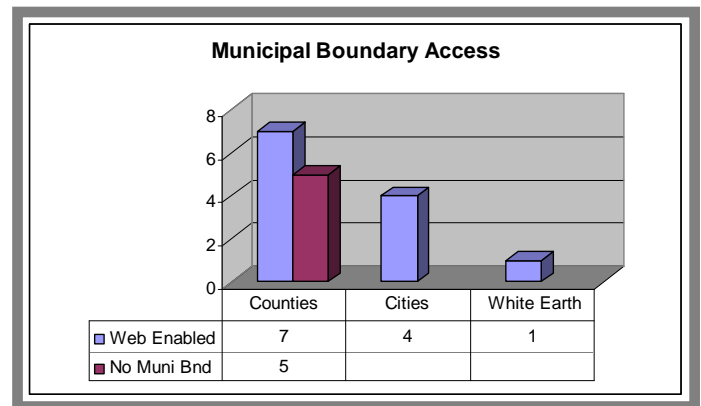|	Counties	Cities	White Earth
Web Enabled	7	4	1
No Parcel Data	5		

Municipal Boundary Data Access

All local government organizations that have developed digital parcel data also have municipal boundary line data. The accuracy of the data is based on the accuracy of the parcel data.

The municipal boundary line data is available on the internet applications provided by the organization, along with digital parcel data.
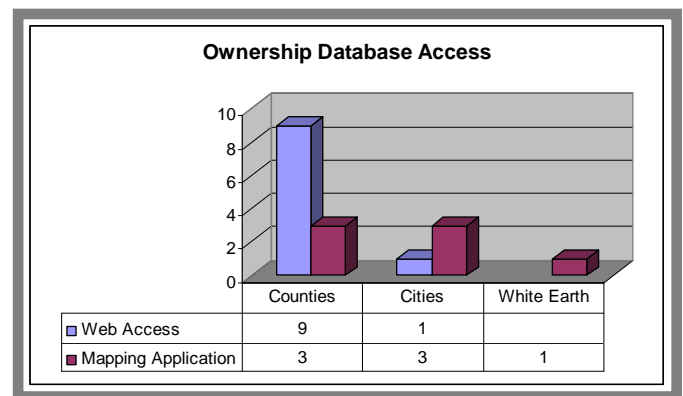
Metadata is available for the municipal boundary lines for 6 of the counties, 4 of the cities and the White Earth Indian Reservation.

Municipal Boundary Access

	Counties	Cities	White Earth
■ Web Enabled	7	4	1
■ No Muni Bnd	5		

Ownership Database Access

The counties within District 4 maintain the ownership database information for the county, cities within the county and the White Earth Indian Reservation (the Reservation spans all of Mahnomen County and a portion of Clearwater and Becker Counties). All counties have the ability to provide tax information via the internet, but not all the information is accessible to the public.

The same local government organizations that have developed digital parcel data, utilize the parcel data to link to the ownership tax information. The database is searched by parcel number, name or address. Tax information is downloaded daily. Valuation information is only altered and downloaded once a year.

Ownership Database Access

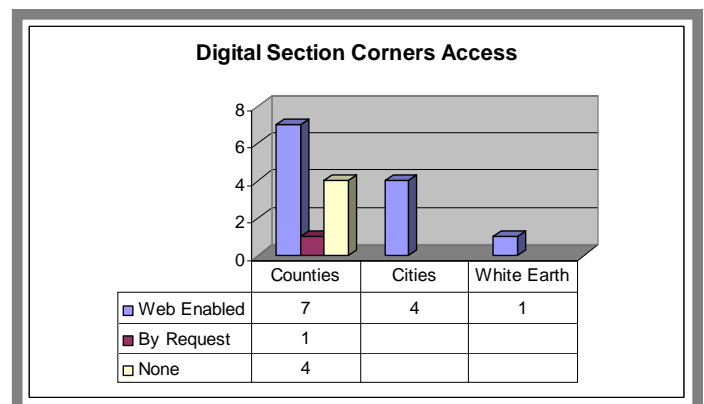|	Counties	Cities	White Earth
■ Web Access	9	1	
■ Mapping Application	3	3	1

Digital Section Corners Access

Digital section corners exist for all of the local government organizations that have developed digital parcel data. Stevens County has not yet developed parcel data, but is in the process of collecting section corners. HARN corners have been located every 3 miles and monumented corners have been located on every section corner for 4 of the 16 townships within the county.

The section corner locations of the other local government organizations are of varying accuracies based on the method of collection. Collection methods include:
> Surveyed
> HARN based
> GPS
> Other sources

Digital Section Corners Access

	Counties	Cities	White Earth
■ Web Enabled	7	4	1
■ By Request	1		
☐ None	4		

Both Big Stone and Stevens Counties are currently collecting the following additional information as part of the section corner effort:
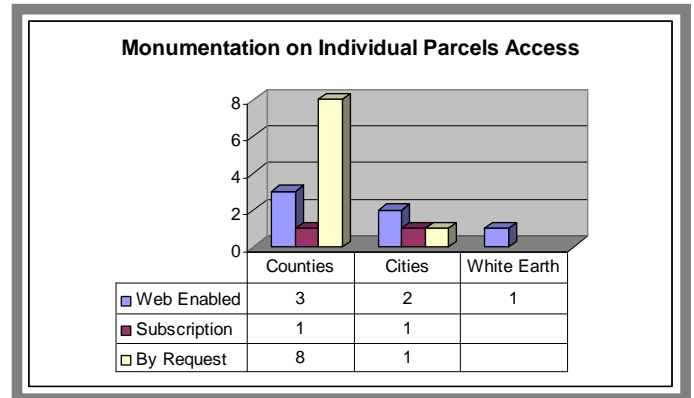> Approaches Barrier Strips
> Culverts HARN monuments (with the assistance of Mn/DOT)
> Signs

Monumentation on Individual Parcels Access

Access to monumentation on individual parcels may be restricted if the information has been copyrighted by the private surveyor that collected the information. The majority of the information exists in paper format and can be requested from the local government organization.

The web application will contain a request mechanism that will allow:
>Scan and upload
>Email
>FAX or mail

Monumentation on Individual Parcels Access

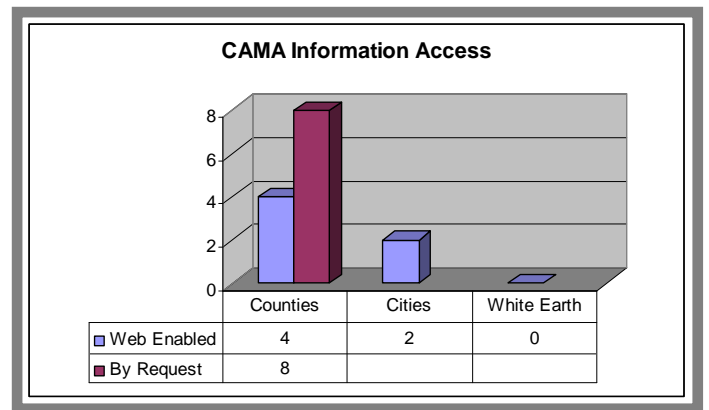|	Counties	Cities	White Earth
Web Enabled	3	2	1
Subscription	1	1	
By Request	8	1	

CAMA Information Access

The counties maintain CAMA (Computer Aided Mass Appraisal) database information for the county, cities within the county and the White Earth Indian Reservation.   33% of the counties and 50% of the cities have CAMA information accessible on the internet. The majority of local government organizations choose to distribute CAMA data by request.

CAMA data that is acquired by request is delivered in two formats, digital and on paper. The web application will contain a request mechanism that will allow:
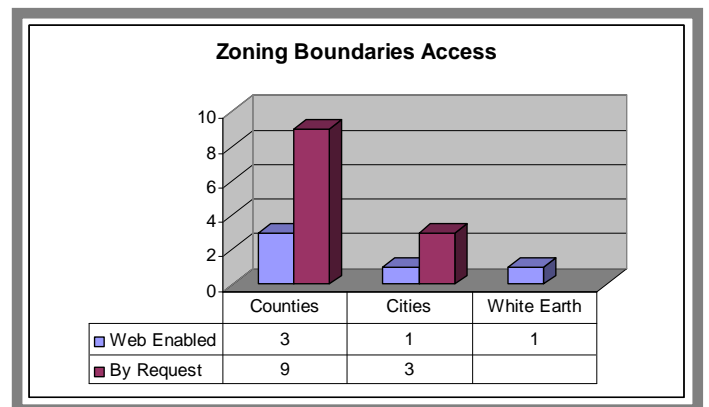>Email digital information
>Scan and upload, FAX or mail paper information

CAMA Information Access

	Counties	Cities	White Earth
Web Enabled	4	2	0
By Request	8		

Zoning Boundaries Access

All local government organizations have zoning boundaries, but the information is not digital in most cases and is available by request. The accuracy of the digital data three in (3) counties is based on the accuracy of the parcel data.
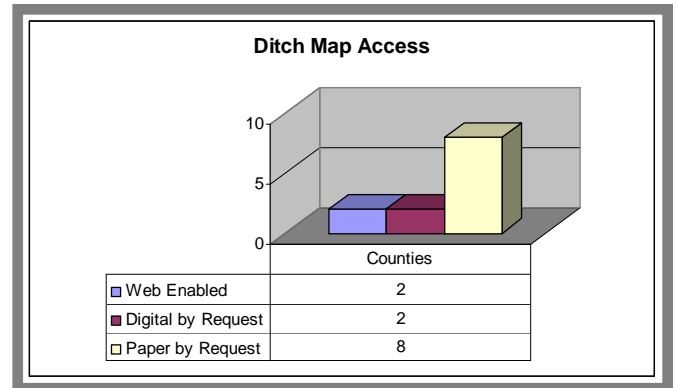
Metadata is available for the zoning boundaries for three (3) of the counties, one (1) city and the White Earth Indian Reservation.

Zoning Boundaries Access

	Counties	Cities	White Earth
Web Enabled	3	1	1
By Request	9	3	

Ditch Map Access

33% of ditch maps owned by counties are in digital format. The ditch information was interpreted from paper maps, heads up digitizing utilizing 2003 FSA photography and the MNDNR ditch data (contained in the hydrography dataset), or heads up digitizing using imagery alone.

Ditch maps that exist in paper format are very large, sometimes in rolls and very old. Stevens County plan to GPS ditch location in the near future.

Ditch Map Access

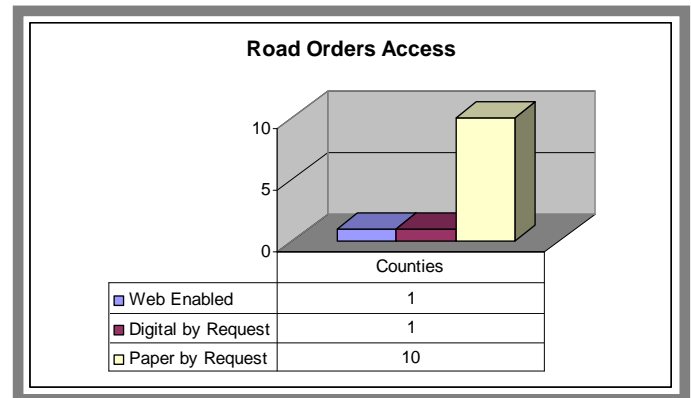|	Counties
■ Web Enabled	2
■ Digital by Request	2
□ Paper by Request	8

Soils Maps – High Resolution

No county, city or the White Earth Indian Reservation owns high resolution soils maps or digital soils data. The soils data is small scale data, digitized at a scale of 1: 24,000 or greater. The paper soils maps are typically half section or half quadrangle maps containing soil line boundaries. Classification systems for soil types fall into three (3) categories: County system, SSURGO system or generalization of soil types into broad crop value classification.
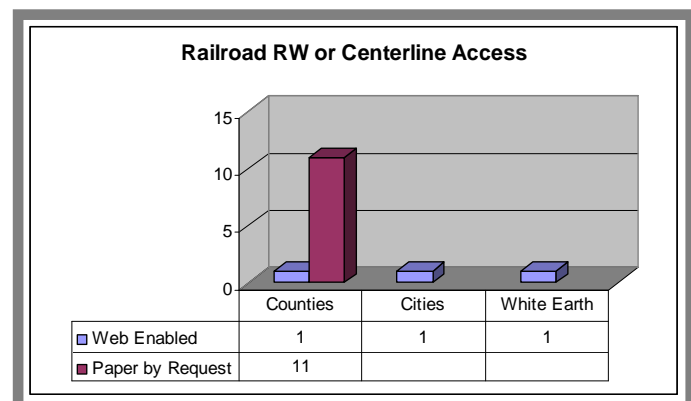
Road Orders Access

Township road orders are not always held by the counties. Some townships store their own road orders. Since this information is rarely requested it is low on the priority list of documents requiring imaging. Only two (2) of the twelve (12) counties have imaged documents, while the remainder are in paper format and would require research time to locate and deliver.

Road Orders Access

	Counties
■ Web Enabled	1
■ Digital by Request	1
□ Paper by Request	10

Railroad Right of Way or Centerline Access

Railroad right of way and centerline data is stored at the county level on large format paper, and paper rolls. Only Clay County, the City of Moorhead and White Earth Indian Reservation distribute railroad right of way and centerline data in digital format, as the result of parcel data development.

Railroad RW or Centerline Access

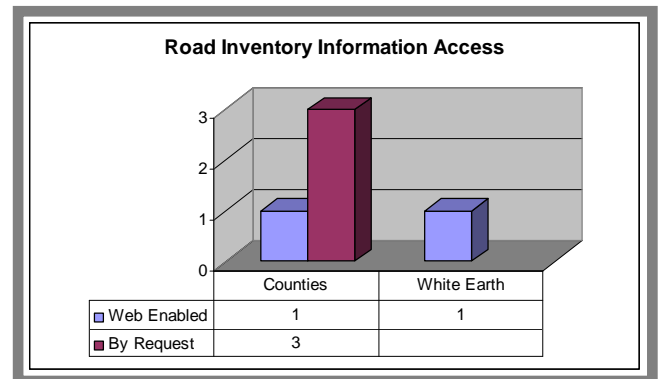|	Counties	Cities	White Earth
■ Web Enabled	1	1	1
■ Paper by Request	11		

Additional Data that is Valuable to Mn/Dot

An additional six (6) items were listed as data valuable to Mn/DOT, but not necessary in relation to Mn/DOT right of way work. Details pertinent to the item are documented along with a bar chart that displays categories of accessibility. Details were collected as items in the database interview form and in notes taken during the interviews.
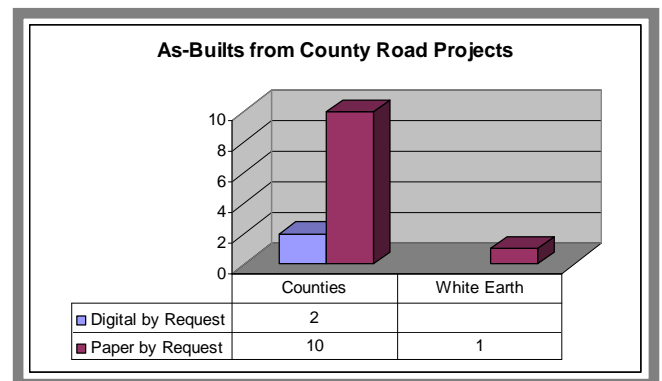
Road Inventory Information Access

Mn/DOT project TAP members were interested in being able to import local government road inventory information, and to have the ability to export road inventory information to local government. 33% of counties collected or stored road inventory information in a format that could be shared.

- Clay County — Spatial road geodatabase
- Douglas County — Excel spreadsheet
- Big Stone — Custom database application
- Stevens — Mn/DOT video log
- White Earth Indian Reservation — BIA centerline photo inventory

Road Inventory Information Access

	Counties	White Earth
Web Enabled	1	1
By Request	3	

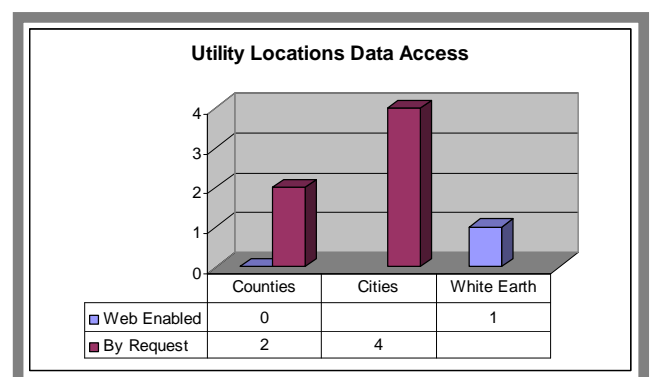## As-Builts from County Road Projects

All county organizations had a means of developing digital As-Built data (AutoCAD, Eagle Point, ICAHD, or out sourced to private company), but old information is stored on paper, or cannot be located. In some cases, the data is developed and maintained by private companies and the request would be passed along from the local government organization to the private company.

As-Builts from County Road Projects

	Counties	White Earth
Digital by Request	2	
Paper by Request	10	1

Utility Locations Data Access

Utility location data is not available from local government organizations to other government agencies via an internet link. However, the White Earth Indian Reservation is in the process of enhancing their web portal and is planning to share utility location information with Mn/DOT.

The web application developed in Phase 3 will be able to pass a request to the appropriate person in a local government organization and log the request. Mn/DOT will receive the information via data upload, email, FAX or mail.

Utility Locations Data Access

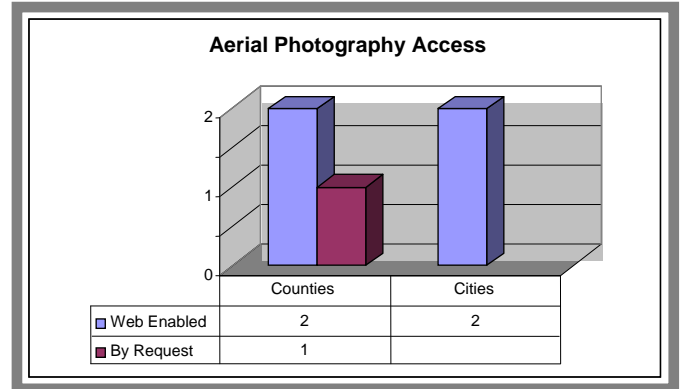|	Counties	Cities	White Earth
Web Enabled	0		1
By Request	2	4	

Aerial Photography Access

All local government organizations utilize the Farm Service Agency ortho-imagery for GIS project use, planning, or AutoCAD data development. The counties and cities listed below have acquired additional photography for their use.

Clay County/City of Moorhead   MrSID format
Douglas County   Pictometry
City of Fergus Falls   Low altitude photography

Aerial Photography Access

	Counties	Cities
Web Enabled	2	2
By Request	1	

Otter Tail County implemented an aerial photography program in 2007 that utilizes an Un-manned Aerial Vehicle (UAV). The UAV has been used to collect low altitude aerial photography that is then geo-referenced to existing features or aerial photography.

Local government organizations do not collect or maintain the last two (2) items of additional data that were listed as valuable to Mn/DOT in a format, or of a scale that would be of interest to Mn/DOT at this time.

Elevation Data

Elevation data was acquired by download of data from the MNDNR Data Deli. Elevation data is sometimes collected when a surveyor (private or local government) collects information, but the elevation data is not collected or accessible in a consistent manner and would require research on an individual case basis.

Otter Tail County plans to collect DEM data in the future by equipping their UAV with an infrared laser range finder.

Wetland Data

Wetland data was acquired by download of data from the MNDNR Data Deli. The wetland data utilized by local government is sometimes edited to improve the location or existence of the wetlands, but the scale of the data is not any larger. The wetland data source is the National Wetlands Inventory.
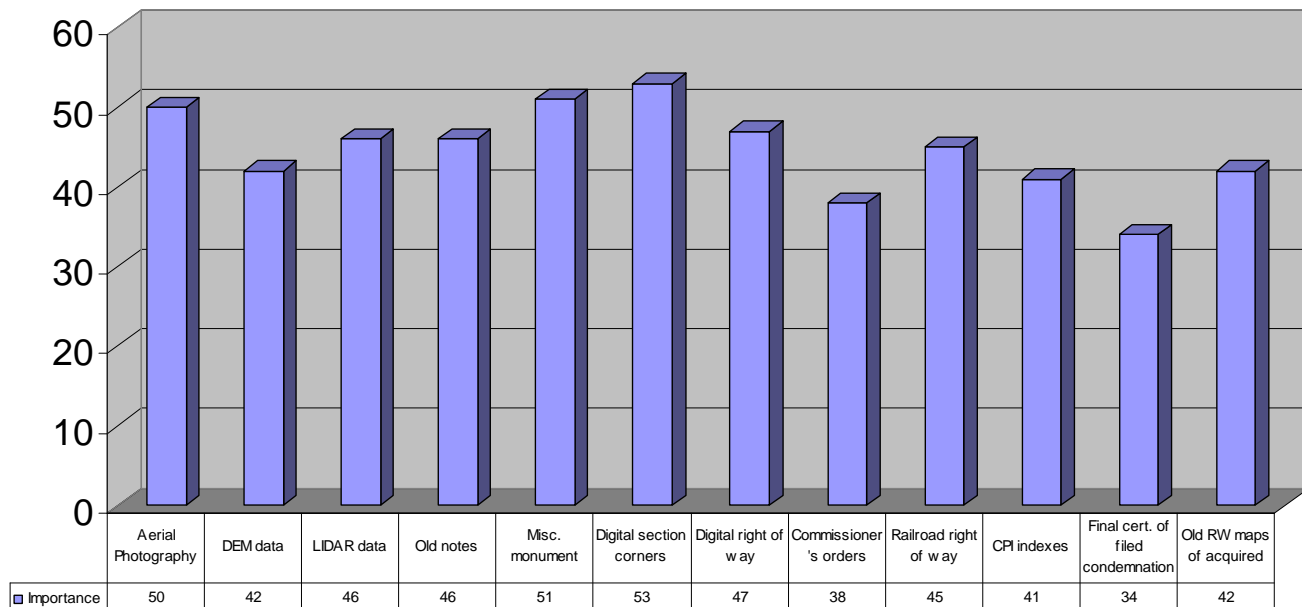
Local Government List of Valuable Data in Relation to Local Government work

Twelve (12) items were developed by the project TAP as the local government list of data valuable to acquire in relation to local government work. The list of valued information is included as *Appendix A*. Mn/DOT develops, collects and maintains all twelve datasets in multiple formats, servers, web applications and databases. All datasets, except the MN/Model statewide archaeological predictive model information for historical artifacts, would be accessible to local government organizations. PWA is in discussion with Mn/DOT staff (as part of Phase 3) to determine the most effective and efficient methods for accessing and distributing the information.

Making Mn/DOT data accessible to local government will require different methods, depending on the dataset, and current storage and retrieval methods. Some datasets will require allocation of more resources (staff, hardware and software). Because different datasets will require varying effort and resources, PWA conducted an additional survey of local government organizations to identify which datasets would be of most importance to local government. Results of the survey will assist in planning for priority of data distribution to local government.

Local government staff were asked to assign an importance value to each of the twelve items in the list of local government valuable data. The value range was from 0 to 4, with 4 being the most important. A total compiled value of 60 was possible for any one data item. Digital section corners were ranked of highest importance by local government with a total value of 53. Final certificates of filed condemnation were ranked of lowest importance with a total value of 34 (counties record and archive this information also).

Importance of Shared Mn/DOT Data to Local Government

	Aerial Photography	DEM data	LIDAR data	Old notes	Misc. monument	Digital section corners	Digital right of way	Commissioner's orders	Railroad right of way	CPI indexes	Final cert. of filed condemnation	Old RW maps of acquired
Importance	50	42	46	46	51	53	47	38	45	41	34	42

Project Considerations Involving Access to Local Government Information

Data Access Permissions
- Interviews with the local government organizations were conducted in person and involved various departments. Not all departments were able to attend the interviews, and follow-up meeting interviews or telephone interviews will be conducted during Phase 3 of the project to ensure that all pertinent and authoritative local government staff are contacted during the project.
- Big Stone County has requested a presentation for the County Board of Commissioners. Additional counties or cities may require the consent of the County Board or City Council prior to establishing data sharing practices. PWA will also be working closely with each department responsible for the desired data, and the Information Systems staff of the local government organizations throughout Phase 3.
- Security and authentication is a concern in regard to data sharing also. PWA will work with Mn/DOT to develop a secure web application for internal service to Mn/DOT and local government.

Data Access Methods
Computer systems and workflows for seventeen (17) local government organizations vary based on technology history, technology funding, and department management. In Minnesota, there are a limited number of private companies that provide services to local government for GIS mapping, tax database information, and document imaging system, which creates a degree of consistency for accessing the information contained in those systems. PWA will be working with Mn/DOT to develop information access strategies for local government systems within District 4.

Web mapping applications with links to databases and imaged documents
1. PWA WebFusion / ArcGIS Server
2. Mapmorph / MapServer
3. Custom application / ArcGIS Server

Online ownership database applications
1. ACS /AS400
2. CPU / AS400
3. Manitron / SQL based in 2008

Online imaged document systems
1. ISC
2. CSA
3. Tri-Min
4. Fidlar

Data Storage Methods
This project will work with data that is stored by three (3) main methods.

Local government servers
- The information will be accessed directly from the server, or the web application will link with applications already in place on the local government server.

Hosted servers
- Local government information or applications are stored on a vendor's server. The vendor will allow access to the web enabled application to view the information.

Require periodic upload to Mn/DOT Server
- Data is not accessible via a web enabled application or web accessible storage method.
- Mn/DOT already has an upload process in place that can be modified for the purposes of this project. PWA staff will be meeting with Mn/DOT Information Systems staff to discuss methods for data upload.
  - Uploading is a choice for data sharing that is secondary to Mn/DOT viewing data.

Mn/DOT TAP members list of data that is valuable to acquire in relation to R-O-W work.
1. Deeds – abstracts or torrens
2. Survey records – section breakdowns, private certificates of survey, certificate of gov't. lot corner
3. Recorded plats – including condos, auditors subdivision, registered land surveys
4. Right of Way plats
5. Digital parcel data – line work classified by level of accuracy, documented with metadata
6. Municipal boundary line
7. Ownership database information – downloadable and in report format
   a. Assessment
   b. Market value
   c. 5 year sales history
8. Digital section corners – points classified by level of accuracy, documented with metadata
9. Monumentation on individual parcels – points that could be documented in metadata (requires a systematic approach and on an as needed basis).
10. CAMA – computer aided mass appraisal information and sales information
11. Zoning boundaries
    a. Appraisers need to know for property and comparable sales
12. Soils maps – high resolution
    a. Used for wetland mitigation
    b. Appraisers use for cropland valuation
13. Ditch maps
14. Road orders – generally township roads
15. Railroad R-O-W or centerlines

Local Government TAP members list of data that is valuable to acquire in relation to local government work.
1. Low level and other aerial photography
2. DEM (digital elevation model) data
3. LIDAR (laser imaging detection and ranging)
4. Old notes – historical field notes or alignments (Available in District 4 and District 1 on EDMS)
5. Miscellaneous monuments picked up in an area (ex: project monuments – irons and property corners)
6. Digital section corners – electronic exchange of X, Y coordinates
7. Accurate locations of R-O-W in digital format
8. Commissioner's Orders – to know what is within Mn/DOT's jurisdiction
9. Railroad R-O-W maps
10. Roadway condition information – CPI indexes
11. Final certificate of filed condemnations (also file with County)
12. Old R-O-W maps of what was acquired (scanned but not coordinate correct)

There are many datasets that would be valuable to Mn/DOT and local government that are outside the range of this project but would be worthwhile documenting. Mn/DOT may have datasets that are unknown to local government agencies and those agencies may also have datasets unknown to Mn/DOT. As a deliverable of the project, assessment and commentary of future data sharing will be included in the final report.

Additional data valuable to Mn/DOT
1. Road inventory information from local government and to have the ability to export Mn/DOT road inventory information to local government
2. As-builts from county road projects
3. Elevation data collected by local government
4. Aerial photography
5. Wetland information
6. Utility locations and metadata

Additional data valuable to local government
1. Bridge hydrology information
2. MN/Model - statewide archaeological predictive model information for historical artifacts
3. Water resource data (ex: culvert inventory)
4. Sign inventory
5. Traffic counts and other related information