Business Plan

for

Statewide Parcel Data Integration

September 28, 2012

Business Plan for Statewide Parcel Data Integration acknowledgements:

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Development of a statewide parcel data set is considered one of the top data priorities for federal, state, local, tribal, non-profit, academic, and public stakeholders in the State of Minnesota. While several programs exist to collect parcel data and distribute within regional groups or single agencies, a comprehensive process for combining parcels statewide has never been established. This Business Plan puts forth a prudent and effective approach for aggregating a seamless, statewide parcel data layer. In the near term, the goal is to make this statewide parcel data set (spatial and attribute) available to all state agencies with subsequent expansion to all government entities. In the long term, the goal of the Business Plan is to achieve free and open distribution of parcel data from counties to the public, including local, state, federal, regional and tribal government, academia, non-profit organizations, private industry and individual citizens.

For two decades, an enormous investment has been made in Minnesota to develop, collect, utilize and maintain parcel data with a majority of counties maintaining digital parcel data and all counties maintaining descriptive parcel attributes.   It is estimated that this county investment totals nearly $30 million and includes nearly three million parcels of land ownership within the State. In addition, regional organizations and state agencies have been collecting, converting, and distributing county parcel data to stakeholders, at substantial cost.

The benefits of aggregating and distributing statewide parcels are substantial and are expected to provide a significant return on investment. These expected benefits include:

- Simplified data management – reducing staff time to distribute data, eliminating redundant collection efforts, and supporting regional data sharing
- Support for local, regional, state and private efforts for emergency planning, collaborative projects, shared applications, inter-jurisdictional decision making and management, economic development, and public service

This plan recognizes that issues exist that will require communication, education, and innovative approaches to resolve. While counties identified a number of these issues in a June 2011 survey, all were considered manageable by survey respondents. These potential issues include:

- Liability concerns over misinterpretation of data, or privacy issues related to property ownership information
- The cost of data distribution and concern for loss of revenue at the county level
- Licensing concerns and the need for assistance to develop data sharing policies and agreements
- The need for standard spatial and attribute parcel data specifications

The proposed program will require five years to complete: three years to develop mechanisms for outreach to counties and processes for parcel data acquisition, aggregation, harmonizing and distribution for the majority of Minnesota counties; and an additional two years for possible transfer of conversion processes to the counties and continued outreach to counties requiring assistance to

participate in statewide parcel data integration. The goal is to attain 90% statewide parcel data integration within the five year time period.

Funding for the development of this "Business Plan for Statewide Parcel Integration" was made possible by a grant to Minnesota Geospatial Information Office (MnGeo) from the Federal Geographic Data Committee (FGDC).

1 PROGRAM GOALS

1.1 VISION STATEMENT

This Business Plan for Minnesota envisions a **statewide parcel data layer** containing both spatial and attribute data that is constructed as the composite of original, authoritative data contributed by the state's 87 counties. This statewide data set would be **publicly available** and would be **updated on a regular, systematic basis**. The statewide data set would not replace authoritative local data but rather would supplement its utility by providing both the statewide and regional coverage that is necessary for numerous users and applications.

Achieving this vision will require the **coordinated, voluntary actions of numerous parties** including the Minnesota state government and county parcel data custodians. Achieving this vision may require:

- Appropriate **data sharing agreements**/memoranda of understanding

- Data and database **standards** and guidelines

- State government sponsored efforts to **collect, aggregate and harmonize county data** into a standard, statewide data set

- Centralized **data access and distribution** capabilities

The four vision requirements listed above are further detailed in the Requirements and Approach section of this Business Plan.

1.2 OBJECTIVES

1.2.1 Aggregation and accessibility of a statewide parcel data layer

Parcel data sharing between counties, state agencies, and the public has been conducted on a per request basis as the development of parcel data has increased during the last decade.   Although parcel data sharing has been conducted to aggregate parcel data and distribute within regional groups or between single agencies, this practice has not been instituted on a statewide basis. This Business Plan presents a practical and effective approach for aggregating a seamless, statewide parcel data layer. The data will initially be incomplete, but improve over time as voluntary contributions are sought from all counties able to share data.

This Business Plan proposes a vision for public distribution of data over a five year timeframe. This timeline allows for an incremental increase in county participation and progress toward meeting spatial data and attribute data guidelines.

1.2.2 Active participation and contributions from Counties

It is recommended that the process start with a coordinated outreach effort by the State to willing and able counties. These counties are categorized as "Early Adopters" in the groupings detailed in the Organizational Approach section of this Plan. The early adopters meet all required capacities for

available and accessible data, data sharing policies, metadata, and no fee policy for data distribution. Counties included in the Early Adopters will become leaders for the effort and examples of parcel data integration.

During the timeline, the State should continue outreach efforts to broaden participation with all counties within Minnesota. Since many counties may not have the capacity (staff, data or policies) necessary to prepare their data for sharing, data will be sought and accepted "as-is" initially to encourage voluntary contributions from all counties. Some of the early adopter counties with the appropriate resources may be encouraged to deliver the data already transformed into the State's standard format.

The technical capabilities of counties will determine whether data will be provided via upload, FTP or direct access. Presently, several counties allow direct access to state agencies for data acquisition, while most counties place data on a county-provided FTP site or upload to a requesting agency FTP site. Based on a data sharing agreement/ memorandum of understanding between the State and the counties, counties will share data with reference to each county's ability to meet the guidelines for spatial data features and attribute information, technical ability, and preferences for data distribution.

1.2.3 Acquiring and harmonizing data by the State

Based on results from the June 2011 Survey[1], data consumers require county parcel data updated at the following frequency:

Update	% of
Annually	48.3
Quarterly	25.4
Monthly	5.9
Weekly	5.1
Daily	5.1
Rarely	8.5
Never	1.7

The State should be responsible for performing the tasks needed to acquire each county's parcel data (spatial and attribute[2]) and harmonize the data into a seamless statewide parcel data layer. To meet the majority of needs for parcel data consumers and to match MetroGIS and MNDNR quarterly data harvest frequency, initially the State will attempt to harvest data quarterly from the counties.

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[1] Appendix 2 of the corresponding "Statewide Parcel Integration Business Plan Appendices"

[2] Spatial parcel data or geospatial parcel data is defined as the geographic location of features and boundaries of tax parcels. Spatial parcel data is mapped, stored and accessed as coordinates, line and polygon features. Attribute parcel data is the tax parcel information collected for land records purposes. Attributes usually include parcel identifier, owner name/address, legal description, but can also include other information such as land value, building value, improvements, estimated taxes, etc.

1.3   BACKGROUND

1.3.1   Coordination

In 2004, the State completed its initial Strategic Plan "A Foundation for Coordinated GIS: Minnesota's Spatial Data Infrastructure" as part of the national I-Team initiative launched by the U.S. Office of Management and Budget (OMB). While the national initiative focused on addressing financial barriers to establishing a National Spatial Data Infrastructure (NSDI), the Minnesota I-Plan focused on issues specific to the State including documenting the use and value of the State's "framework" data as well as clarifying priorities and recommending policies and actions that would meet stakeholders' needs. Parcel data was identified as one of Minnesota's eight foundational data layers and ranked among the top data requirements from a broad set of stakeholders.   The plan recognizes that while counties are the principle producers of parcel data, the State owns and manages over 5.6 million acres, and federal agencies own and manage 3.4 million acres of Minnesota land. This Business Plan focuses on the compilation of county-managed parcel data.

In February 2009, "A Program for Transformed GIS in the State of Minnesota: Program Design and Implementation Plan" was completed. Based on that work, this document lays out a program design and implementation path for transforming GIS in Minnesota. In parallel, the Strategic Planning Committee of the Minnesota Governor's Council on Geographic Information assessed options for an organizational transformation of GIS and recommended creating a Minnesota Geospatial Information Office (MnGeo) and advisory groups through legislation which was implemented in 2009. These two efforts have been closely linked and, together, provide a blueprint for a fully transformed GIS operation for state government.

To fill the coordination gap identified by the study, the Plan recommended that MnGeo offer enterprise services in three (3) areas with eight (8) activities including:

1. Leadership, Outreach and Communication

2. Data Coordination[3]

3. Technology Coordination

4. Data Services

5. Web Services

6. Training

7. Guidance

8. Project Support Services[4]

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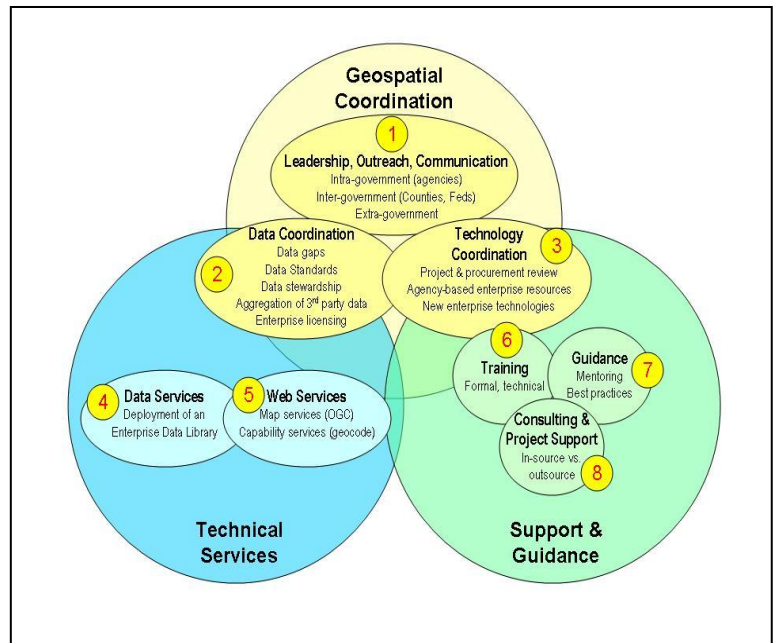
[3] Recommendation number two, "Data Coordination", established MnGeo's authority over geospatial data coordination activities including the creation of a statewide parcel data layer as set forth in this Business Plan.

1.3.2 Investment Made to Date

It is important to acknowledge the considerable investment made by Minnesota counties and state agencies to develop and maintain parcel data and to create sustainable data sharing between agencies to date. This project builds and optimizes on that investment.

1.3.2.1 MINNESOTA COUNTY INVESTMENT CALCULATIONS

Minnesota is divided into 2,870,901 parcels of land ownership[5]. Most of the 87 Minnesota counties and other local government agencies have been developing spatial parcel data for several decades for use internally, and for distribution to government agencies and public access. As of 2004, 57 of the State's 87 counties reported that they had developed digital parcel boundaries[6]. Based on results from the Survey of Data Providers collected in June 2011, provided as Appendix 2, the number has increased substantially to 79 of 87 counties[7]. During the course
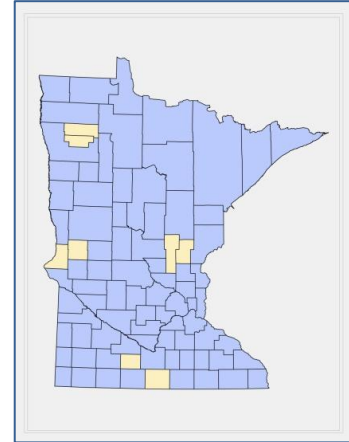
of this project, an additional 5 counties began the process of translating parcel legal descriptions into digital parcel data boundaries[8]. Nearly all Minnesota counties have, or will have, some digital parcel data available for sharing. At a conservative industry cost of $10.00 per parcel[9], that is $30 million initially invested by local government for the development of digital spatial parcel data. This initial investment cost does not include ongoing maintenance costs for counties.

79 of 87 Counties with Spatial Parcel Data

1.3.2.2 REGIONAL AND STATE AGENCY INVESTMENT EXAMPLES

State agencies have been acquiring digital parcel data from counties for use in agency projects for as long as the data has been available. There has not been a coordinated multi-agency state effort for acquiring the data, nor has there been a coordinated effort for distributing the data among

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[4] *The Minnesota Geospatial Information Office (MnGeo) was created under Minnesota Statute "16B.99 Geospatial Information Office"*

[5] *Stage, D., and N. von Meyer. 2010; Federal Geographic Data Committee (FGDC) Cadastral Subcommittee; State Parcel* Management Workgroup, *An Assessment of Parcel Data in the U.S. 2009 Survey Results,* *http://www.nationalcad.org/showdocs.asp?docid=1158&navsrc=Project (*December 2010).

[6] *Statewide Parcel Mapping Inventory (SPMI) 2004* survey results available at: www.mngeo.state.mn.us/chouse/SPMI.

[7] Minnesota digital parcel data percentage increased from 66% (2004 SPMI) to 90% (June 2011 Survey of Data Providers) in a 7 year period. This percentage compares to an increase nationally of 68% to 72% from 2005-2009 (http://www.nationalcad.org/showdocs.asp?docid=1158&navsrc=Project)

[8] Information collected by Pro-West & Associates, Inc. through surveys, project workshop, and individual communication with Minnesota counties.

[9] Since 2000, the cost of parcel data has ranged from $5 per parcel to $15 per parcel. The range of cost is related to the complexity of the data (whether the data includes rights of way, easements, stacked parcels, ditches, etc.) and the accuracy of the data (accuracy of section corners such as surveyed, hand-held GPS, or state supplied corners, and/or development methods such as coordinate geometry (COGO) or heads-up digitizing). The $10 cost is averaged and based on June 2011 survey information on methods used and anecdotal information supplied by Pro-West & Associates, Inc.

state agencies, causing recurring redundant effort. Below are two examples of agency efforts to acquire, aggregate and distribute parcel data regionally and statewide.

1.3.2.3   METROGIS

The seven metropolitan counties served by MetroGIS are included in a regional aggregation of parcel data compiled across county boundaries. Following an initial process investment by MetroGIS to develop a regional parcel data solution (which includes data specifications, standardization scripting and custodial role development) the subsequent yearly cost for aggregating the data is approximately $4000 per county (payment for allowing access and meeting attribute improvement targets) and a modest amount of staff time each quarter for aggregation and posting.

Since the counties are providing the data quarterly in the required MetroGIS format, staff time is limited to a few hours each quarter to aggregate and post the data for distribution.

1.3.2.4   MINNESOTA DEPARTMENT OF NATURAL RESOURCES

The Minnesota Department of Natural Resources has been acquiring, standardizing and compiling digital parcel data into a single layer from counties throughout the State for five years. Initially, the effort required the commitment of .25 FTE technical support person's time, and additional staff time to develop an enterprise Geodatabase and to broker license agreements with the counties. While there is currently no regular update schedule, MNDNR estimates that a twice a year update cycle for county parcel data maintenance would require about a .25 FTE annually.

1.3.3 National Context

Nationally, assembling statewide parcel inventories is becoming increasingly important, and there is an emerging body of experience on both the utility of statewide parcels and approaches for constructing this kind of data resource. States that have completed parcel business plans and are actively pursuing parcel development or aggregation include Arkansas, Delaware, Massachusetts, New Jersey, New York and Tennessee. This Plan supports the vision for the National Spatial Data Infrastructure (NSDI) by creating a process where local, authoritative parcel data is compiled into a statewide data set and, in turn, can be integrated at a national level. Benefits at the national level echo those gained at the local and regional levels as NSDI will reduce duplication of effort and ensure that the best available parcel information is used in decision making.

1.4   PROJECT ACTIVITIES

1.4.1 Participant Input

Throughout the process of developing this Business Plan, a key activity has been listening to all stakeholders and incorporating their needs, concerns, experiences, and successes. To that end, a Steering Committee was formed to represent stakeholders from local, state and federal government,

private industry and academia. Multiple surveys and a workshop were conducted to gather information from a broad range of parcel data users and producers pertaining to parcel integration statewide. The surveys and workshop were conducted in sequence; the surveys provided information for discussion during the workshop.

A brief description of the surveys and workshops that were conducted as part of this project are listed below.

Steering Committee Meetings: The project was guided by Steering Committee members selected for their experience, interest and investment in parcel data sharing on various levels. Members were involved in project kick-off, survey development, workshop participation, and review of business plan outlines, drafts and the final plan document. Steering Committee Members are listed as Appendix 1.

Survey of Data Providers, June 2011: This "pre-project" survey was county focused (results in Appendix 2) to augment the SPMI[10] for the fourth time in a decade. All 87 counties were contacted by phone and responded to the survey.

Survey of Data Consumers, March 2012: This on-line survey was conducted to collect information about the needs of organizations that developed and/or consumed parcel data (results in Appendix 3).

Project Workshop, April 2012: The workshop was focused on the common purpose of data sharing throughout the State. Nearly 50 people attended on-site at Mn/DOT's Arden Hills Training Center while 11 remote locations were connected throughout the state by video system. A list of attendees, remote locations and workshop notes are included as Appendix 4. Participant stakeholders were made up of technical and administrative staff from local, state, federal, and tribal government, regional and non-profit organizations, private industry, and academic institutions.

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[10] *Statewide Parcel Mapping Inventory (SPMI) 2007* survey results available at:, www.mngeo.state.mn.us/chouse/SPMI.

2 BENEFITS & ISSUES

2.1 BENEFITS

Benefits to local and state agencies as well as citizens, non-profit organizations, tribal entities, and the private sector will be broad and varied. Property ownership, location and feature proximity impacts short and long-term planning from the rapid decisions of the emergency responder to the long term protection of environmental resources. The private sector depends on parcel data to comply with permitting processes and identify optimal sites for new businesses. In short, investments in parcels will benefit a very broad cross section of stakeholders.

2.1.1 Parcel Data Return on Investment

Studies completed in several other states, as well as the "National Land Parcel Data: A Vision for the Future" (2007), indicate that statewide parcels have and will generate a substantial return on investment in terms of benefits and cost savings. As presented by the National Research Council, "It can be argued that in addition to the efficiencies that digital parcel data brings to the assessment community, the parcel layer used as a base map is the most information rich database with the broadest utility to local, state and federal agencies."[11]

King County, Washington (population 2 million people) performed a return on investment (ROI) study (2011-12) to determine money saved by utilizing GIS to serve citizens. The study included the cost to provide spatial data (including parcel spatial data) and databases (including attribute parcel data) to internal agencies, government agencies and its citizens.

The County realized an annual cost/benefit ratio of 1:10 for GIS use for their organization. A portion of this benefit was from their parcel data (Total investment $200 million / conservative benefit of $776 million – $1.7 billion in 18 years). The benefits were measured in outputs that were quantitatively and qualitatively better with the use of GIS, leading to more demand for the outputs over time.

2.1.2 Evidence from Other States

Publicly available digital parcel data has resulted in a wide variety of benefits in other states ranging from emergency response to equitable tax appraisal. Minnesota can expect to receive similar benefits with the implementation of this Business Plan for statewide parcels.

2.1.2.1 NORTH CAROLINA EMERGENCY RESPONSE TO FLOODING

The State of North Carolina is prone to flooding because of frequent hurricane activity, with average annual flood damages of $56 million[12]. On September 18, 2003, Hurricane Isabel arrived on the outer banks of North Carolina leaving devastation in its path.   While the hardest hit communities

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[11] National Research Council, "National Land Parcel Data: A Vision for the Future" (Washington D.C.: The National Academies Press, 2007), 53.

[12] Smith, Brandon R. "Floodplain Fliers: North Carolina's Massive LiDAR Project", *GeoSpatial Solutions*, February 2002.

were identified and evacuated in plenty of time, the lack of digital parcel data inhibited damage assessment and distribution of emergency relief funds. Many of the more rural communities were unable to provide responders with digital data. In response, a Federal Geographic Data Committee (FGDC) workgroup was created to evaluate the importance of parcel data in emergency response situations and to identify issues that limited access to these data. The workgroup efforts revealed that in many cases, local governments had digital parcel data, but had problems getting it to emergency response crews in an efficient and standardized manner.

Parcels are essential for formulating disaster management plans and for helping to preserve the assets of the State and its citizens. "Knowledge about who owns a given piece of land, the value of improvements made to the land, and current use of the land can be crucial in formulating disaster management plans."[13] In North Carolina, where available, digital parcel data helped expedite insurance claims and federal emergency loans, thus greatly reducing the processing time and labor required for the recovery effort.

2.1.2.2 MONTANA CADASTRAL DATABASE

The Montana Cadastral Database was completed in 2002 and is publicly available for all counties in the State. The Montana Department of Revenue maintains the parcel maps for forty-nine of fifty-six counties with the remaining seven being maintained by county GIS staff. Montana works closely with the Bureau of Land Management to improve the accuracy of the parcel data through its Montana Cadastral Framework Program. The public as well as local governments and state agencies benefit from the parcel database through its use in countless applications ranging from agricultural appraisal to determination of surface ownership for lease agreements by private oil and gas firms.

The parcel data is made accessible for query and download via the State's Cadastral Website and a 2002 cost/benefit analysis estimated that the website alone was providing an annual benefit of approximately five million dollars as thousands of individuals, from realtors to state employees, use the parcel data accessible on the website on a daily basis.

2.1.2.3 ARKANSAS GEOSPATIAL STRATEGIC BUSINESS PLAN: STATEWIDE PARCELS

Parcels are a critical data set to the State of Arkansas as evidenced by the disproportionate demand for parcel data from the State's geospatial web services. Parcels alone count for 13% of data requests despite the fact that less than 50% of the State's parcels are digitally available, and an even smaller percent are available via the web service. The State's 2010 Strategic Business Plan revealed a long list of the expected benefits and returns that investment in statewide parcels would bring. These include:

- Improving efficiency and equity in property tax assessment, revaluation and revenue collection
    - Finding new, untaxed development on existing parcels
    - Performing automated agricultural land assessment based on soils

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[13] David Stage & Nancy von Meyer, "Parcel Data for Emergency Response", *GeoIntelligence Magazine*, September, 2004.

- Increased ability to perform analysis such as viewing assessment sales ratios (ASRs) across an entire county to look for clusters of high or low values
- Increased revenue collection from property taxes that will lead to increased school funding
- Routine state government planning and decision making
- Providing a key tool for economic development and meeting site selection consultant requirements
- Resolving jurisdictional boundary questions
- Providing an invaluable tool in assembling the statewide address databases

2.1.3 Benefits to Counties

Parcel data are extremely useful in county operations, whether in planning and zoning, public health, building inspections, assessment, education, conservation, public safety or other departments. As different counties have different levels of GIS maturity and requirements, there will be differing perspectives on benefits.

2.1.3.1 SIMPLIFIED DATA MANAGEMENT

Creating a standardized and aggregated statewide parcel dataset provides many benefits to the managers and users of parcel data, including:

- Eliminating the workload associated with redundant requests from multiple state agencies and the private sector by enabling parcel data distribution from a single state-level source. Currently, a county may be asked to provide parcel data to many separate state agencies via separate data requests. Similarly, a state agency would need to make 87 separate requests for parcels to achieve statewide coverage. With a statewide approach, a county would only need to provide the data to the State once, and the state could be responsible for sharing it amongst its own agencies.
- Ability to work with parcel maps from adjacent Counties as part of evaluating regional projects such as developments that cross or are near county boundaries.
- Reduced staff time spent fulfilling data orders, collecting fees, and accounting for fees obtained. In the end, the fees collected may not cover the time expended to distribute the data or support fee collection.
- Support for broader regional property sales comparisons becomes possible with statewide parcel data. Often, in rural areas there can be a need for cross-county sales comparison checks due to an inadequate number of "in county" comparable sales.
- Statewide guidelines for spatial and attribute data would eliminate the need for each county to develop their own.

2.1.3.2 SUPPORT FOR ECONOMIC DEVELOPMENT

Statewide parcels will provide a key tool for economic development and business site selection consultants. When businesses or their site selection consultants are looking for properties, it is critical that they be easily able to view property boundaries and key characteristics of the parcels

such as current assessed value or current land uses. Of equal importance can be information on abutting properties such as the number of neighbors a given parcel may have. Counties and states that have their parcels completed and on-line are at a distinct advantage in this arena.

2.1.3.3   PARCEL BASE MAP

In addition to the data content benefits described above, parcels – like orthophotography – fulfill an important base map function. Specifically, a variety of political and administrative boundaries such as school districts or zoning are coincident with property boundaries. For example, a given parcel should not be split by a school district boundary. Accurate parcel data will help ensure that there is no ambiguity about the taxation and services provided to that parcel. Without statewide parcels, it will be impossible to properly map such boundaries across the State, and there will continue to be inequities and time spent resolving jurisdictional boundary questions.

2.1.3.4   IMPROVED PUBLIC DATA ACCESS

By providing access to digital parcel data, property information can be made publicly available 24 hours/day via web access. Improved access to digital parcel data will mean that the public can answer many questions on a "self-service" basis rather than requesting information from a public servant.

2.1.3.5   POTENTIAL FOR SHARED APPLICATIONS

With broad access to a central standardized parcel data set, the State could potentially develop and host "shared applications" that would run against the multi-county parcel data set. The shared applications could also be made available to participating counties. These applications would be particularly valuable to counties that have less well developed GIS programs, and limited technology and budgets available for application development. The following applications support common county workflows and could be feasibly developed and hosted for participating counties:

- Automated tool for identifying spills and hazards on parcels
- Automated tool for identifying wells and reservoirs on parcels
- Parcel abutter identification and owner notification within specified distances of a subject parcel or parcels
- Wetland and floodplain data overlay analysis with statewide parcels
- Administrative areas such as zoning, emergency services, school districts, and others are best maintained as an aggregation of parcels as some cross county lines
- Comprehensive planning on a regional scale with an emphasis on conservation planning and habitat preservation

2.1.3.6   SUPPORT FOR FLOOD CONTROL AND EMERGENCY MANAGEMENT PLANNING

Minnesota experiences flood events each spring and at other times of the year during periods of prolonged or heavy rainfall. The availability of spatial and attribute parcel data has improved emergency management planning and flood control planning for local government, state and regional agencies for flood events.

- Public safety situations such as a missing persons search or conducting a large scale evacuation can benefit from access to detailed data from neighboring jurisdictions. Furthermore, state emergency response to and planning for county and local governments can be made more efficient with centralized access to parcel data (e.g., for locating potential staging areas).

- Effective sharing of equipment and human resources for regional emergency management organizations within the State and between states.

- Consistent cadastral data will aid federal agencies in damage assessment during emergencies which could speed disaster funding allocation.

2.1.4 Benefits to Cities

Just as with Counties, Cities use parcel data to support a wide variety of operations including transportation, economic development, property valuation, inspections, permitting, and infrastructure planning. As such, Cities receive benefits from parcels very similar to those felt at the County level. As cities and towns are often producers of local parcel data, statewide parcels allow for simplified data management through the elimination of duplicate data requests from state agencies and reduced staff time spent fulfilling data orders. As consumers of statewide parcel data, Cities would benefit by obtaining access to parcels outside of their municipal boundaries thus allowing regional views and analysis of property information and support for fair property taxation across the state. The availability of accurate and up to date parcel data on a regional level also supports City public safety efforts including emergency management planning and damage assessment as well as City permitting activities including tracking and analyzing permitting activity geographically.

Tax Increment Financing (TIF) districts and watershed districts would also benefit from reliable statewide parcels. As TIF is generally used to redevelop sub-standard buildings and support economic development, regional parcels would assist in identifying land use types, delineating district boundaries, conducting assessments, and planning redevelopment efforts. Statewide parcels used in conjunction with orthoimagery would support watershed districts in their efforts to calculate impervious surfaces on a parcel by parcel basis and assess appropriate fees.

2.1.5 Benefits to State Agencies

Parcel data are also used by state programs with involvement in specific sites and with missions as varied as economic development, transportation infrastructure management, broadband infrastructure planning, property tax equalization, natural resource protection, land use and environmental permitting, large-scale emergency response and disaster recovery, energy facility siting and property management to name a few.

2.1.5.1 IMPROVED MANAGEMENT OF STATE LANDS

Statewide parcels would allow land managers to visually assess their lands in relation to the overall context of land ownership and quickly identify abutters that are likely responsible for encroachment

and/or buffer violations. Routine, comprehensive field assessment is often not feasible as the exterior boundaries of lands controlled by the state's environmental agencies add up to over 2000 miles. In the Minnesota Department of Natural Resources (MNDNR), parcel boundaries provide agency staff or their agents with immediately accessible information regarding the owners of land subject to notification, investigation or enforcement actions. In other cases, notification would be a matter of public safety and welfare such as owners of land abutting a parcel where a spill was reported might need to be informed about a threat to their water supplies. The parcel mapping, which eliminates the interpolation error of commercial geocoding, would directly support such requirements and allow DNR staff to implement operational and regulatory mandates more efficiently and effectively.

2.1.5.2   ABILITY TO VIEW PARCELS WITH OTHER FOUNDATION DATA LAYERS

As other foundation layers, such as LiDAR and orthophotography, are developed and made accessible on a statewide basis, the need to add parcel data to this view becomes more acute. While LiDAR and orthoimagery are powerful in themselves, the ability to identify ownership and property boundaries, and conduct parcel-based analysis on key attributes would greatly strengthen the utility and value of these other foundation data layers.

2.1.5.3   SUPPORT FOR PROPERTY "DISTRESS" INDICATORS

Standardized, statewide parcels would provide a common, statewide platform for integrating, comparing, and analyzing key factors such as utility shut-offs, mortgage payment status, foreclosures, unemployment, crime statistics, and undelivered mail. Parcel data makes it possible to correlate these disparate factors and observe patterns before a situation reaches a critical point.

2.1.5.4   SUPPORT FOR STATE AGENCY BUSINESS PROCESSES

The following are examples of the many ways in which a statewide parcel dataset would support the day-to-day business of state agencies. It should be noted that many of the example benefits, such as "geocoding support", are applicable to multiple agencies but are only listed once below.

- **Public Safety**
    - Geocoding support
    - Crime prevention analysis
    - Emergency management support

- **Department of Natural Resources**
    - Property management
    - Abutters identification and notification
    - Wetlands identification
    - Wildlife management and hunting access
    - Severed minerals development and distribution

- - Flood hazard mitigation and prevention

  - Open space land acquisition and habitat preservation/restoration

  - Conservation easement and scenic easement management

- **Board of Water and Soil Resources**

  - Natural resource modeling

  - Drought management

  - Assist local government to manage water resources

- **Department of Transportation**

  - Right of Way Assessment

  - Land management

  - Abutters determination

  - State Aid collaboration

  - LRS road maintenance

  - Flood hazard mitigation and prevention

- **Department of Public Health**

  - Land use mix assessment

  - Walk-ability determination

- **Department of Agriculture**

  - Feed lot mapping and analysis

- **Department of Employment and Economic Development**

  - Transit planning

  - Site selection for various programs

- **Forest Resources Council**

  - Resource planning on private ownership

- **Homeland Security and Emergency Management**

  - Emergency preparedness

  - Multi-hazard mitigation plans

2.1.6 Benefits to the Public and to the Private Sector

2.1.6.1 ENHANCED PUBLIC SAFETY THROUGH E911 SUPPORT

Parcel data supports the development and maintenance of statewide address data and often serve as a key indicator of new addresses at the local level. Accurate address data are essential to effective public safety response.

2.1.6.2 MORE EFFICIENT PERMITTING PROCESSES

Parcel data are essential to the permitting process for identifying proximity to protected areas, relevant features or buffer zones as well as notifying abutters to the project. Contractors spend time and budget hunting down parcel data from various sources, converting data to a usable format, or even digitizing parcel data on a case-by-case basis. These activities and costs would be significantly reduced with statewide standardized parcels.

2.1.6.3 SUPPORT FOR ECONOMIC DEVELOPMENT

Local businesses that develop their enterprise based on land records locations would greatly benefit from access to statewide parcels. Such businesses and activities include:

- Environmental services route planning
- Utility installation, repair, and maintenance
- Delivery services (floral, grocery, express delivery/cross country delivery)
- Real estate sales query and planning
- Locating day care centers, schools, and amenities
- Commercial business site location analysis
- Private transportation planning (senior citizens, day activity centers)
- Insurance companies
- Title companies
- Engineering companies
- Agricultural resource planning
- Commercial industrial site planning

2.2 ISSUES

2.2.1 Key Issues

Issues and obstacles surfaced in survey results and workshop discussions. The issues that surfaced most often or were considered a priority for respondents have been grouped into Key Issues: Liability, Cost, and Licensing. Each of the key issues is detailed below. Responses to other issues are included in the survey findings and workshop notes in Appendices 2-4. The bar charts listed below are created from the June 2011 Survey of Data Providers and April 2012 Survey of Data Consumers. The numbers listed above each bar indicate the number of respondents that selected the particular response.

2.2.1.1 LIABILITY

An issue that was evident through the surveys and echoed during the workshop was the issue of liability. Liability is a broad issue that takes into account the counties' concerns over misinterpretation of data by consumers, privacy, and re-distribution of data.

The Survey of Data Producers and Consumers results indicate that misinterpretation of data and re-distribution of data can be managed with the use of disclaimers, metadata constraints, license agreements and third party license agreements. Several counties, including Clay, Dakota, St. Louis and Lake have been distributing data for many years and have never had issues with liability.
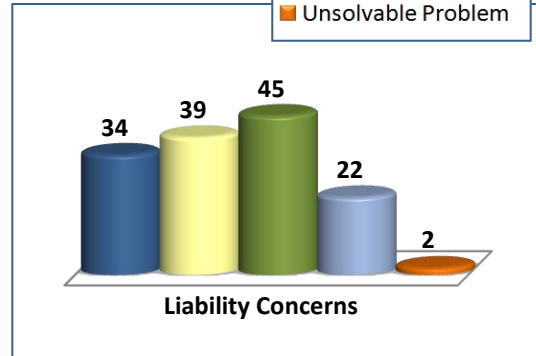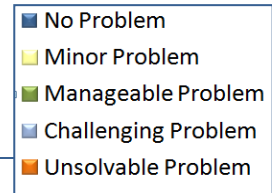
Privacy issues arise from the concern related to property ownership information and related tax parcel data information being distributed to the public. While this concern is common, these data are by law public records. Creative solutions exist to minimize or eliminate such concerns while still making the data publicly available.

A standard proposed by the Digital Cadastral Data Committee for the transfer of parcel attribute data include property ownership information and tax parcel data information (Appendix 4). Counties should be asked to **voluntarily** provide these data as they are able. Data would be distributed as agreed upon in data sharing agreements at each county to address concerns for providing too much information to the public.
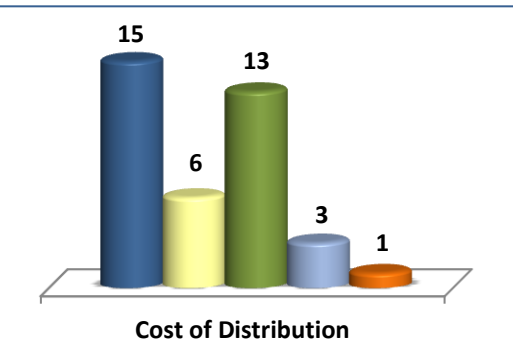
2.2.1.2 COST

Budgets are tight. People are being asked to defend department functions or to generate revenue. Whether a county does or does not charge a fee is a determining factor for the level of data sharing that can be accomplished for that county.

Data Distribution: Centralized data access would eliminate the need for counties to distribute data to the public and multiple agencies. Data would be acquired by a single state agency and

Legend:
- No Problem
- Minor Problem
- Manageable Problem
- Challenging Problem
- Unsolvable Problem

Liability Concerns
(34, 39, 45, 22, 2)

April 2012 Survey of Data Consumers, Appendix 3 Question # 18

Cost of Distribution
(15, 6, 13, 3, 1)
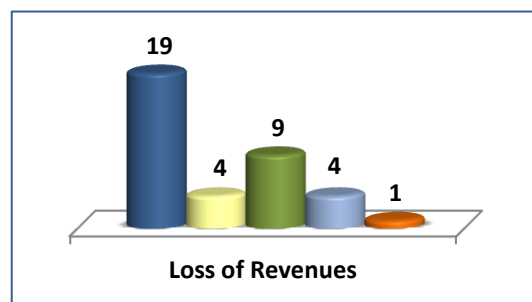
April 2012 Survey of Data Consumers, Appendix 3 Question # 12

Loss of Revenues
(19, 4, 9, 4, 1)

April 2012 Survey of Data Consumers, Appendix 3 Question # 12

distributed, based on an agreement, to other agencies and to the public.

**Loss of Revenue:** Discussion during the workshop and informally between counties and project staff, show that significant county staff time is needed to handle data requests, distribute data, collect and record fees. For some counties, the fees collected for data selling do not cover the expense of time required to provide the data. This is a challenging issue due to the need for education about the true cost of data distribution for counties.

2.2.1.3 LICENSING

June 2011 Survey results indicate over 60% of counties have a data sharing policy in place. The policy documents include: memoranda of understanding, waiver release, non-disclosure form, disclaimer and licensing agreement. Half of the remaining counties are considering developing a data sharing policy.

Informally, counties have adopted existing policies developed by MetroGIS and by counties such as Goodhue County. Both post the policies on their web sites and participate in regional collaborations that disseminate the documents. Geography is not a barrier as counties in the far northern reaches of the State have utilized policies written to meet the licensing needs of counties in the far southern reaches of the State.

Counties are being asked to voluntarily contribute data in the format and content that they are able.
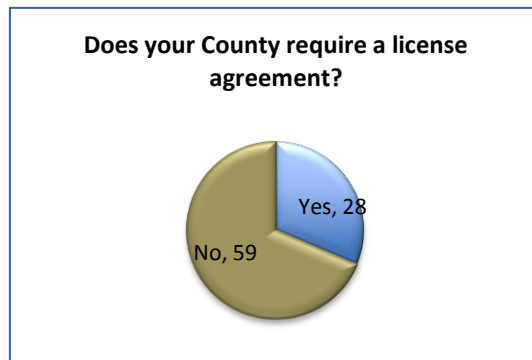
June 2011 Survey of Data Providers, Appendix 2
Question # PDS4

2.2.2 Priority Needs

Data sharing needs for organizations were compiled from surveys and workshop discussions to define common and priority needs. Priority needs include: Standard Data Specifications, Agreements, and Funding. Each of the priority needs is detailed below. Responses related to other data sharing needs are included in the survey findings and workshop notes in Appendices 2-4.

2.2.2.1 STANDARD DATA SPECIFICATIONS

Defining clear specifications for a statewide parcel dataset will facilitate the efficient transfer and aggregation of such data from the counties to the State. The specifications for the statewide parcel dataset become the framework for a parcel data exchange "standard". Some counties already have the capability to export their parcel data into a specified exchange format, while other counties will need assistance to transfer data to the State. Counties will be encouraged to participate at the level that is possible for their agency.

Standard spatial data specifications are minimal for data aggregation by the State. Spatial data will be accepted "as is" to encourage county participation.

Standard attribute data specifications are in the process of being addressed by the Digital Cadastral Data Committee (DCDC) of the Minnesota Geospatial Information Office [14] and MN.IT Services (OET).   The draft attribute data transfer standard has been constructed on the proven MetroGIS parcel data specification. Common parcel attributes are detailed in an easily understandable matrix. Counties are being asked to voluntarily contribute data "as is" to encourage county participation. For those counties delivering attribute data in the standardized format, with the exception of the county ID and PIN fields, each county can decide which fields to populate.

Currently, the Minnesota Department of Revenue is planning a program to collect land records information at the property classification level. Standard attribute data specifications may be affected depending on the ability of the parcel data integration program to use the information collected by the Department of Revenue.   The Department is planning to work with vendors that host tax parcel databases, or develop and manage tax parcel databases for Counties. The Department should be asked to review the DCDC attribute data specifications to investigate possible collaborative attribute specifications.

The ability of the counties to export data into the attribute data specifications will be incremental and may require the evolution of tax parcel databases managed or hosted by vendors, or the use of standard queries to reformat data from existing databases.

Detailed specifications and requirements are documented in the Requirements and Approach – 3.2 Data Requirements and 3.5 Standards sections.

2.2.2.2   AGREEMENTS

It becomes necessary to also define clear roles, responsibilities and policies for how parcel data will be transferred from counties to a statewide dataset. This will become the basis for a standardized parcel data sharing agreement. Currently, there are almost as many different agreements being presented to counties for data as there are requests for the data itself. Some counties refuse to distribute data in an attempt to avoid staff time dealing with agreements. A major point of discussion during the project workshop was the need for the State to develop one agreement that would apply to all state agencies. This would eliminate the need for counties to have legal representation review multiple agreements.

MetroGIS serves as an instructive example for how data specifications and participant roles and responsibilities work together to form a successful data sharing agreement. The MetroGIS agreement allows the Metropolitan Council (the regional custodian) to assemble a regional parcel dataset with minimal manual effort by their staff[15]. The agreement includes update schedule, data projection, data format, and data processing roles.

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[14] Digital Cadastral Data Committee, *Draft Data Transfer Standard Purpose Statement and Overview* available at http://www.mngeo.state.mn.us/committee/standards/parcel_attrib/parcel_attrib.html

[15] MetroGIS *Guidelines and Best Practices* available at: http://www.metrogis.org/data/standards/index.shtml

2.2.2.3 FUNDING

The substantial increase in digital parcel data development experienced since 2003 is due largely to the increase in County Recorder's fees that are dedicated to improving land records technology[16]. Many counties that have developed parcel data in the last several years have used these funds for development purposes. Many counties have also improved their recording process by integrating imaged documents and improving databases with the additional fees. The fees cannot be used to supplant the normal operating expenses for the office of county recorder or registrar of titles. The funds can be used for other than GIS activities such as finding PLS corners, acquiring LiDAR/elevation data, on-line permitting systems, etc. at the direction of the county board.

Although these fees have been instrumental for the initial development of digital parcel data recently, not all counties have enough recording activity to fund data maintenance or tasks needed to meet guidelines for data sharing. Counties that do not have the capacity to participate in data sharing with the State in the initial phases of the project will have an opportunity to provide spatial data and attribute data when possible, and will be included in outreach efforts by the State.

April 2012 Survey of Data Consumers, Appendix 3 Question # 18

Options exist for smaller counties or counties with little funding to participate in data sharing activities with the State. Many counties outsource parcel data maintenance to vendors, other counties, or regional organizations for a fee. Since the volume of parcel data edits is low for these counties, the cost for maintenance is minimal. A bonus for this type of arrangement is that the vendor or agency assisting the county also works to transfer the data to the State or allow direct acquisition as agreed upon by the county. The county pays for data transfer to one centralized distribution point rather than responding to numerous requests for data.
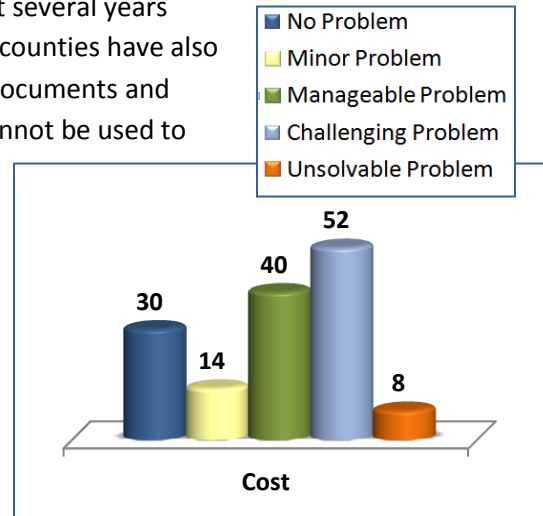
2.2.3 Other Issues and Needs

Additional issues and needs were identified through the project surveys and workshop that are not necessarily drivers for this plan, but are still important. The Survey of Data Consumers, Appendix 3, contains all survey responses. Other notable concerns identified as either minor or manageable include technology limitations of the counties, privacy of Tribal data, and supplying data in the requested format.

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[16] 2011 Minnesota Statute 357.18 County Recorder https://www.revisor.mn.gov/statutes/?id=357.18 and Statute 357.182 Recorder's Fees and Recording Standards for Recording of Real Estate Documents https://www.revisor.mn.gov/statutes/?id=357.182

2.3 RISKS

Several efforts, spanning over a decade, have led to the development of this Business Plan. In that time, counties have invested greatly in parcel data development, and data standards, and data sharing policies have been put into practice. At the same time,various regional and state agencies have undertaken acquisition and distribution of parcel data to meet their business needs. The State has never been more poised to implement this project, but it is not without risk.

The following is an overview of the major risks that should be avoided to accomplish statewide integration of parcel data:

2.3.1 No Statewide Parcel Data Integration Program Implemented

There is considerable interest and good will to integrate parcel data statewide from all stakeholders: county, city, regional, state and federal government agencies, non-profit and academic organizations, and the public. This good will have developed over two decades of cooperative discussion and planning for statewide data sharing at the local, regional and statewide level.

If the State opts to delay or to not undertake the program a significant opportunity will be lost. Parcel data acquisition, harmonizing, and distribution would continue as it has, as a regional or per request basis, thereby proliferating multiple redundant and costly aggregation efforts. Currently, the State has a an opportunity to leverage initiatives that include LiDAR and derivative elevation data, orthoimagery, street centerline and address point projects with statewide parcel data integration. Not implementing statewide parcel data integration would impact all levels of inter-governmental collaboration, and service to the public.

Risk impact: **Severe**

Risk Mitigation Strategy: Outreach to state policy makers and state agency administration to educate about the potential return on investment. Focus on funding mechanisms as outlined in section 2.3.4 and inter-governmental data collaboration for better government.

2.3.2 Lack of Full Participation by All 87 Counties

There is a high probability that not all 87 counties will be able to participate fully in data sharing with the State during the project timeline. The recommended implementation path endeavors to overcome integration barriers by making participation within reach of all counties, but there are still reasons that full participation may not happen.

2.3.2.1 INABILITY OF LOCAL GOVERNMENT AGENCIES TO PARTICIPATE

Minnesota counties have a capacity for land records technology at this time in history like they have never had before. Evidence is the astounding number of counties – 83 – that have developed digital spatial parcel data or are in the process of developing data. Although this statistic is promising there still remain risks for non-participation and completing work in a given county due to low funding and institutional barriers.

- **Lack of Funding:** As documented in project surveys, and discussed during the project workshop, counties have been able to develop parcel data but struggle to find funding to support maintenance. There are options, detailed in the earlier Issues section of the Business Plan, that include outsourcing maintenance to vendors, other counties or regional organizations. Counties that are late adopters will require consistent outreach to assist with concerns related to data sharing and may not be able to meet the data guidelines within the five year timeline.

- **Lack of Motivating Factors:** While over 95% of Minnesota counties have chosen to create digital spatial parcel data to meet their own business needs, and most are willing to share their data with the State, the remaining 5% don't have enough interest within their agency, or do not have the staff in place to carry out a parcel data development project. Outreach by the State and other counties will be of greatest importance for these counties. Assistance in understanding the benefits of digital parcel data and guidelines for data development may be the motivation needed to move toward digital parcel mapping.

- **Reluctance to share data:** A key issue documented in the surveys and echoed during the project workshop was liability. Some counties with the capacity to develop, maintain and share digital parcel data choose not to distribute the data other than to a select few agencies, or not at all. These counties will not be Early Adopters for parcel data sharing and will need specific communication and information outreach to policy and decision makers within their organization.

Risk Impact: Moderate

Risk Mitigation Strategy: Outreach by the State to discuss barriers to participation. Options might include collaborative efforts with other counties, or outsourcing of services to other organizations to meet data sharing guidelines. Some counties may not participate or participate at a low technology level. Changes to the Data Practices Act[17] as proposed to the 2012 legislative session may resolve county concerns.

2.3.3 Inability of State Agencies to Concur on One Agreement with Local Government Agencies

59 of the State's 87 counties are sharing digital parcel data with MN DNR. Data sharing agreements with MN DNR are in place for the counties, but these agreements do not pertain to data sharing between the counties and other state agencies. Each time a county is presented with a data agreement or licensing agreement, legal counsel is required, or the County Board of Commissioners is consulted, or at minimum a County Official or Department Head must expend time to review and sign the document.

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[17] The Data Practices Act introduced as HF2201 in the 2012 Regular Session: Sec. 16. Amending Minn. Stat 13.03, Subdivision 3 includes as Appendix 5: Data Practices Act.

The development of one agreement that envelops all state agencies will simplify the data sharing process and greatly reduce the time required of counties and the State. A more simple process and less time equates to greater participation in data sharing.

Risk impact: Moderate

Risk Mitigation Strategy: Outreach to other state agencies, MN.IT Services and state administration to request an expedited process for developing one agency agreement with counties. The State should work with the County Attorney Association to develop the Agreement.

2.3.4 Lack of Funding for State Management of Digital Parcel Data Integration

Substantial investment has been made by counties to develop digital parcel data that has mission-critical application for the State. Currently, the State conducts redundant efforts to acquire data on an agency by-agency basis, costing the State greatly. Falling short of funding or the reallocation of existing resources for coordination of efforts the statewide parcel data Integration effort will continue the costly and inefficient manner of collecting data agency-by-agency, and will not produce all the benefits possible, as listed in the section 2.1.4 Benefits to State Agencies.

Prudent and accountable state government demands statewide parcel data integration as a common sense and fiscally responsible answer to digital parcel data distribution. This is a solution that fits not only the State, but stakeholders from all levels of government, non-profit, academic, and private organizations. Sustainable, cost effective, public distribution of digital parcel data will set a precedent for future data collaboration in Minnesota.

Risk impact: Severe

Risk Mitigation Strategy: MnGeo outreach to other state agencies, MN.IT Services and state administration to promote a concerted effort for efficient acquisition and distribution of digital parcel data. "Marketing" efforts and education information presented at conferences and meetings attended by state agency stakeholders. Marketing efforts targeted to non-state stakeholders to garner support for the effort.

Development of Funding Mechanisms

States have utilized various approaches for funding programs that require one-time and continuous funding mechanisms. The states listed below had different concerns related to parcel data development, standardization, maintenance, and statewide data collection. All required funding to conduct a parcel program at the state level and encourage participation at the county level.

Arkansas: Arkansas used the state budget to create a grant program to finish county parcels. Counties were asked to "match" funding provided by the State and develop parcels.

Massachusetts: The Massachusetts 911 Office funded parcel development and standardization for all 351 cities/towns as method to get statewide addresses. Maintenance will require resources from MassGIS plus cooperation at local level (requiring continued

outreach and communication from the State). No additional funding source for maintenance has been identified.

New York: The State of New York did not require new funding to develop centralize access to consistent cadastral data. The New York State GIS Office resources were reallocated as a funding mechanism.

Kansas & Tennessee: The development and maintenance of parcels was tied into the assessment process to support "fair and equal assessment". Respective revenue offices provided resources to support collection/maintenance of parcels.

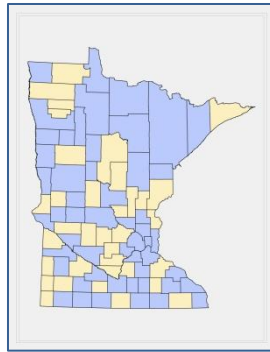# 3 REQUIREMENTS & APPROACH

3.1 ORGANIZATIONAL APPROACH

3.1.1 County Participation

This approach recognizes that not all counties or municipalities have the same resources, ability or willingness to share local parcel data. Due to these differences, there will be varying levels of participation by counties. The items below represent six key factors [18] that will likely impact each County's ability to participate.

1. Spatial and attribute data availability
2. Metadata availability
3. Data sharing policies
4. Fee or no fee to government agencies
5. Ability to distribute (includes technology and liability concerns)
6. Currently sharing data with federal, state, regional, county agencies

County **DOES NOT** meet the key factor requirement

County **DOES** meet the key factor requirement
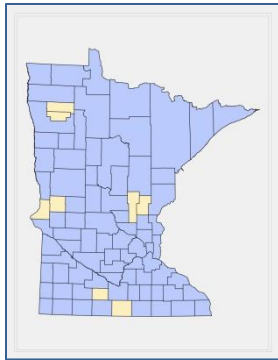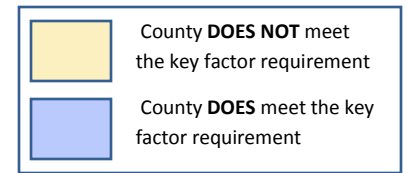
1. Spatial/Attribute Data - 79 Counties

2. Metadata Availability - 52 Counties
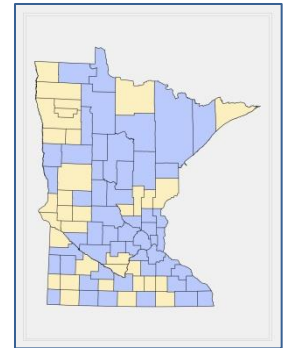
3. Data Sharing Policies - 53 counties
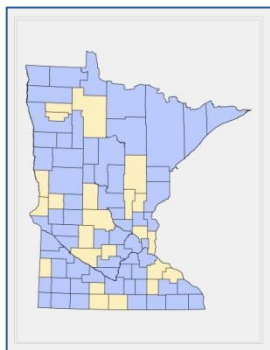
4. No Fee to Gov't Agencies - 64 Counties
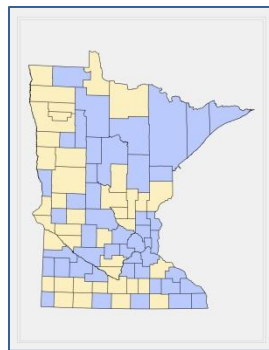
5. Ability to Distribute - 47 Counties
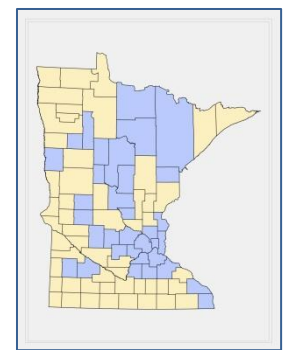
6. Currently Sharing Data - 34 Counties

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[18] Key factors 1, 2, 3, 5, 6 were analyzed from the June 2011 Survey of Data Producers, Appendix 2 of the corresponding "Statewide Parcel Integration Business Plan Appendices". Key factor 4 was analyzed from the March 2012 Survey of Data Consumers, Appendix 3 of the corresponding "Statewide Parcel Integration Business Plan Appendices"

	County **DOES NOT** meet the early adopter requirements
	County **DOES** meet the early adopter requirements

The June 2011 Survey of Data Producers, attached as Appendix 2, was analyzed to create six key factors. The County Matrix, attached as Appendix 5, was built on the six key factors as predictors of county readiness for parcel data integration.

Thirty-three (33) counties that are likely to participate in the program from the outset have been identified as "Early Adopters" in the county matrix. These counties typically have existing parcel data, have data sharing policies in place and have the ability to distribute data sometimes with limitations such as restrictions that prevent reselling or redistribution of the data. Most of these counties are already sharing data with other government entities. Early adopters will be key to the lo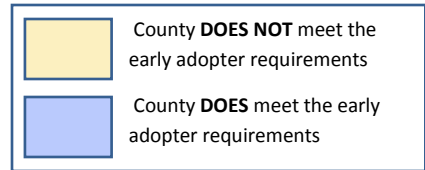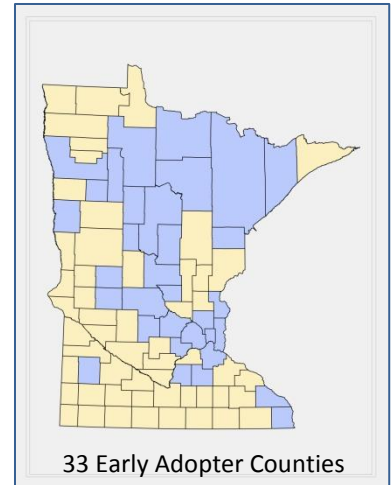ng-term success of the program as they will demonstrate the benefits of data sharing, help refine the workflow for supplying/retrieving data, and serve as informal channels for outreach and education about the program.

33 Early Adopter Counties

Counties that are not able or not willing to participate early on in the program are considered "Late Adopters" and will require additional outreach and education to address the barriers to their participation. Barriers to participation may include lack of data or outdated parcel data, lack of technical ability to transmit data to the State, or liability concerns. These counties may require technical assistance, funding support, or help convincing local decision makers that the program is beneficial. There may be some counties that do not participate within the desired implementation time frame.

3.1.2 Leading the Effort

This Plan recommends that the State be responsible for leading the parcel data integration effort and conduct active outreach and coordination between state government and county GIS programs. MnGeo should facilitate and coordinate the State's efforts on this project. A key success factor in the program will be highlighting the opportunities and benefits of data sharing while also attempting to address legitimate local government concerns.

Leading the parcel data integration effort will require the State to fulfill the implementation and on-going maintenance tasks for at least the first three years of the five year program. The first three years involve a substantial investment of state time to develop the program through outreach and education between state and county government. During this time the State will be responsible for completing a pilot project, developing data sharing agreements, developing standards and guidelines, collecting, harmonizing and aggregating data, and creating centralized data access and data distribution.

At the three year milestone, basic program undertakings will be completed (agreements, standards, integration process and data distribution), laying the groundwork for a successful exchange of data between county and state. Three years provides the State sufficient time to test the program process, both on an institutional level and technology level. Technology can change dramatically within a three

year timeframe. The pilot project and early adopter counties will have "set the bar" for parcel data integration at this recalibration point, enabling the State to re-evaluate whether the counties can perform the data conversion processes at the county level, prior to sharing the data with the State.

The Requirements and Approach section detailed below is written with the assumption that the State will carry-out the tasks documented in the Implementation Plan section.

3.1.3 Outreach and Education

Given that the statewide parcel data layer will be built through the combined and collaborative efforts of both counties and state government, it will be important that there are high degrees of communication and cooperation between these two parties. The State should expect to invest in explicit outreach and education efforts that are aimed at explaining the program to counties and, when necessary, to encourage reluctant counties to participate. Overall, the idea is to create a collaborative "data sharing culture" across the State.

Several other states that are attempting to create statewide data layers through county contributions have taken this approach. In both Utah and Arkansas, the state GIS offices explicitly make efforts to visit *every county* GIS office, at least once every 2-3 years. This type of sustained contact can help in building credibility and in opening and sustaining communication channels. In this manner, counties can become more knowledgeable and familiar about statewide GIS efforts while the State has the opportunity to learn of county concerns and opportunities for the State to provide assistance. While this type of *active* outreach may be catalyzed by the parcel initiative, it can be expected to provide broader benefits to other geospatial efforts that require state-county collaboration.

Regional and statewide GIS groups could provide points of contact and dissemination of information for outreach and education efforts conducted by the State. These established communities of GIS professionals could be leveraged to build leadership at the authoritative data source level.

The regional groups below are known for their approach of "Counties helping Counties" to develop data process, policies, and assist each other technically.

- MetroGIS
- MCGISA (Minnesota County GIS Association)
- Northern Minnesota GIS User Group
- SE Minnesota Counties GIS Users Group
- Pine to Prairie GIS
- SW Minnesota GIS Users Group

The outreach information exchange must be early, consistent and ongoing to encourage broad participation with all counties and stakeholder communities. In general, the counties, regional groups and state agencies understand the importance of a seamless statewide parcel data layer. But, these organizations must continue to be informed of the status of the initiative so that they can advocate for it and shape a solid base of support.

Initial outreach during the first year should focus on counties that are willing and able to participate as Early Adopters. The State should meet with county decision and policy makers to present and discuss the Business Plan and request spatial and attribute data. Throughout the initial outreach effort, use cases should be compiled for counties that have successfully built consensus, shared data, obtained funding and the resulting benefits. The use cases will serve as examples of successful digital parcel data sharing for subsequent outreach to additional early adopters, and late adopters during the second, third, and ongoing years of the project.

Outreach is a time for information dissemination about data standards, potential benefits to counties and the broad range of needs for digital parcel data through the State. Information should be shared on a first-hand county by county level, and make use of web technology to sponsor education webinars, information exchange forums, and periodic newsletters to keep counties, the State, and the public engaged in discussion about data needs and parcel data sharing status.

3.2   DATA REQUIREMENTS

3.2.1 Data Formats

Both project surveys indicate that digital parcel data sharing must be reliable, accurate and current.

3.2.1.1   SPATIAL DATA ACCURACY

The March 2012 Survey[19] indicates that the majority of parcel data consumers need spatial data accuracy within the 1-3 feet distance, while the June 2011 survey [20] of data providers indicates that 25% of counties maintain data within a horizontal accuracy of 1-3 feet and 3-10 feet. Another 39% maintain data within a horizontal accuracy that varies dependent upon the accuracy of the control points utilized for the original spatial parcel data development.

Many counties have implemented survey initiatives to collect accurate section corner and quarter-corner points to build an accurate base of control. Accuracy will improve over time within each individual county. Outreach efforts by the State should emphasize the importance of spatially accurate data and act as a liaison to exchange section corners, township corners, and other types of control between counties and the State.

3.2.1.2   SPATIAL DATA FORMATS

The Business Plan Technology Requirements lay out the geographic boundaries for the data download unit(s), data download format and types of consumable services that will be accepted for spatial data transfer. The crux of the requirements is to provide data in formats that are common

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[19] March 2012 Survey of Data Consumers, Appendix 3 of the corresponding "Statewide Parcel Integration Business Plan Appendices"

[20] June 2011 Survey of Data Producers, Appendix 2 of the corresponding "Statewide Parcel Integration Business Plan Appendices"

today and are compatible with an ETL (Extract, Transform, Load) to harmonize the data for distribution.

3.2.1.3 ATTRIBUTE DATA FORMATS

The Digital Cadastral Data Committee (DCDC) has put considerable effort into designing a draft attribute data transfer standard[21] to be used as a framework for data sharing. The standard defines common parcel attributes that are based on the MetroGIS Regional Parcel Dataset Specifications. Not all counties would have attribute data to populate all fields in the standard, so except for two mandatory fields (County ID & Parcel Identification Number (PIN)) would be populated voluntarily as the counties are able.

Minnesota counties currently have a form of parcel attribute standardization that has occurred due to their need to work within consortiums and associations for parcel attribute database support. Working within a consortium or association provides greater buying power and peer support for counties. The Survey of Data Providers from June 2011 lists all counties and associated attribute database providers, Appendix 2.

- There are four major tax parcel data vendors that supply parcel attribute databases (hosted by the vendor or housed at the county) to groupings of counties. Most counties have both a property tax and appraisal systems which are not usually tied together. A minority of parcel attribute databases have been developed in-house at a county, or developed by a lesser-known vendor.

- The vendors have created specific "GIS extracts" of their data that contain many of the common attributes, and it is technically possible for some counties to extract attribute data from their systems and transfer the data to the State. The translation process coded into an ETL tool would handle translation of attribute data for the four major tax parcel vendors, and would also be able to accommodate the few tax databases that are not maintained by a consortium or within a larger county group.

Translating data from the existing vendor database schema to the statewide database schema was not the concern for survey respondents or workshop attendees; the concern was the cost required to have system vendors write extract programs and to transfer the data. For many rural counties, attribute data is hosted in a system that is not located at the county. The county is charged a fee for download of data and does not control the frequency of data download, unless the county is willing to pay for specific services.

The state outreach role needs to be broad enough to include working with vendors to provide data on a quarterly timeline, and working toward meeting the common parcel attribute requirements for statewide distribution.

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[21] Digital Cadastral Data Committee, *Draft Data Transfer Standard Purpose Statement and Overview* available at http://www.mngeo.state.mn.us/committee/standards/parcel_attrib/parcel_attrib.html

3.2.2 Data Sharing Agreements

Barriers to data sharing have historically posed challenges to the aggregation of a statewide parcel data layer in Minnesota. Data producers have concerns that data may be misinterpreted or used inappropriately if they are freely distributed or resold and that data producers will be liable for the resulting decisions. In many states, data liability is handled through the use of data disclaimers that accompany the distribution of electronic geospatial data, and data users are essentially warned to "use at their own risk", however in Minnesota, the concerns over liability have persisted.

To address these liability concerns, several changes have been proposed to the Minnesota Government Data Practices Act. This Act serves as a framework for the collection, creation, storage, maintenance, dissemination, and access to government data. It states that government data are public and accessible by the public for both inspection and replication except when Federal law, a state statute, or temporary classification deems the data as "not public". Fees are limited to the cost of providing data except where "commercial value" is justified and documented. Several changes have been proposed that would make data sharing and distribution less cumbersome. These include limiting charges for government sharing, allowing for redistribution from governments, and eliminating all liability for data providers. In 2012, these proposed changes to the Act were introduced but not acted upon. The language has been endorsed by the Minnesota Statewide Geospatial Advisory Council, the Minnesota Counties GIS Association and the MetroGIS Coordinating Committee.

Until the proposed changes to the Data Practices Act are in place, the adoption of standardized data license agreements should be encouraged. Goodhue County and MetroGIS provide useful examples of agreements that may serve as models for the development of standardized language.

3.2.2.1 GOODHUE COUNTY

Goodhue County provides a county model utilizing several agreements used to control distribution and limit liability. The language in the license agreement was distributed and utilized through the SE Minnesota GIS Users Group and adopted by several small counties who needed language that would protect them yet allow them to distribute their data. The agreements used today include:

Goodhue County GIS Data Use and Acceptance Agreement[22] :

- Requires description of data use and limits usage to specific project within an agency
- Provides disclaimer on data accuracy and completeness and removes liability

Goodhue County GIS Users Group Data Sharing and Services Agreement[23]:

- Allows participating agencies and Goodhue County to reciprocally obtain GIS datasets for a set term
- Restricts redistribution to 3rd parties
- Provides disclaimer on data accuracy and completeness and removes liability

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[22] http://www.co.goodhue.mn.us/departments/landuse/gis/GCGISUserGroup/Files/Data_Use_Agreement.pdf
[23] http://www.co.goodhue.mn.us/departments/landuse/gis/GCGISUserGroup/GCUG_Agreement_071307.pdf

Goodhue County Data Distribution Approval Form[24]:

- Allows agencies to distribute data to consultants/contractors working on a specific project for a participating agency

3.2.2.2 METROGIS REGIONAL PARCEL DATASET LICENSE

The Metropolitan Council provides a useful regional model from which to learn. In 1997, the Council funded MetroGIS's "Interim GIS Data and Cost Sharing Agreement" to support critical MetroGIS program needs and to foster a common, collaborative environment for counties to share data. Prior to the agreements, no two of the seven metro counties had the same policies and some required other government units to pay cost recovery as well as cost of reproduction fees for access to parcel and other geospatial data. The agreements applied to a wide variety of geospatial data produced by the counties and the Metropolitan Council, including parcel data boundaries and attributes. The agreements provided a combination of GIS project funding and supplemental data maintenance payments to each of the counties in exchange for the counties agreeing to share their geospatial data, in particular parcel data, without fee, other than for modest reproduction costs, with other government organizations, subject to a single set of access policies[25].

Public Party Regional Parcel Dataset License[26]

- Governs access to the Regional Parcel Dataset on behalf of the participating counties
- Defines authorized and unauthorized use
- Provides a disclaimer on data accuracy and completeness and removes liabilities for participating counties

3.2.2.3 EXAMPLE MINNESOTA COUNTIES SHARING DATA

Several counties have been sharing their data freely at no cost without incident or liability problems. Three examples are:

- **Clay County** has been allowing data download from their county website since 1999. Public distribution of data has drastically reduced staff time to respond to data requests.

- **St. Louis County** provides a "Maps on Demand" web application that allows easy viewing and download of PDF county maps. In addition, the county provides digital parcel data on a publicly facing server for state agencies to acquire data as needed.

- **Chisago County** has a data download mechanism built into their public web mapping site to allow easy access and download of data. They maintain current metadata that also can be downloaded.

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[24] http://www.co.goodhue.mn.us/departments/landuse/gis/GCGISUserGroup/Files/Data_distribution_approval_form.pdf
[25] http://www.metrogis.org/about/history/sharing.shtml#phase1
[26] http://www.metrogis.org/data/datasets/parcels/public/license.pdf

For counties that choose to participate in the statewide parcel aggregation program but cannot freely share their data with the public, security measures will need to be put in place to prevent unauthorized access and use of this data.

3.3 TECHNOLOGY REQUIREMENTS

Implementation of this plan will rely on proper technology to provide access to the authoritative parcel data and useful services to meet the following basic needs:

- Manage data and information from disparate sources
    - Acquire data and information
    - Conduct "Extract, Transform and Load" (ETL) processes to aggregate data into a statewide parcel data schema
    - Catalog and organize data, and associated metadata
- Provide access to data and information to meet the needs of GIS users
    - Support search, viewing and visualization interfaces
    - Support "application programming interfaces" (APIs) for application development and business process integration
    - Allow for data download

3.3.1 Data Access

As described in the section on Data Sharing Agreements, until all county parcel data is freely available to the public, methods of access will need to restrict access to county data not publicly available.

- **Web services** are one way in which GIS users will be able to access the data. Web services may be provided in the form of tile caches (e.g. elevation, imagery, LiDAR), map services (organized layers of information), or feature services (individual layers of information). The web services can be served from one location but consumed by multiple counties, other government agencies, academia or the public. Each service should be well documented and searchable making these services easy to locate and access. Access requirements, documented code and an example of the service should be included to further support developers choosing to leverage the service.

- GIS users will often require **Data Download** for additional processing or inclusion in a user's application. Data downloads can be provided in a number of ways, including simple File Transfer Protocols (FTP). The size of county data sets will vary based on what data they are including and the number of parcels they have. Clay County's spatial parcel data file is about 8 MB in size while Rice County's spatial parcel data file is about 138 MB. Compressing the files will reduce their size and make them more transferable.

- **Web Viewers** provide non-GIS users with access to the parcel information in a simplified interface, which is particularly suited to non-GIS users.

3.3.2 Basic Technical Architecture

A set of servers is needed to support the statewide parcel program. They are described below based on their functional purpose.

- For data management, the State will require a database platform that supports spatial data on top of a relational database management software such as Oracle or SQL Server or Postgres.

- The State will require a web server to support a parcel viewer application as well as Web Map Services (WMS) or Web Feature Services (WFS) to provide data access to external applications. This server could also provide any necessary geoprocessing functions that may be introduced such as clipping, reprojection, or extraction to multiple data formats.

- FTP Server for data download and data upload capabilities.

- Web servers should be clustered redundantly to support uninterrupted service.

At this time, the State is in the process of migrating various agencies to the IT Services (OET) structured IT architecture.   This presents unknowns as to where servers will be located, who will ultimately manage the servers and data processes, and whether the Cloud is an option for data acquisition and management, geoprocessing and data distribution.

The diagram below describes the basic technical architecture required to process spatial and attribute parcel data received from the counties, store and distribute the data.
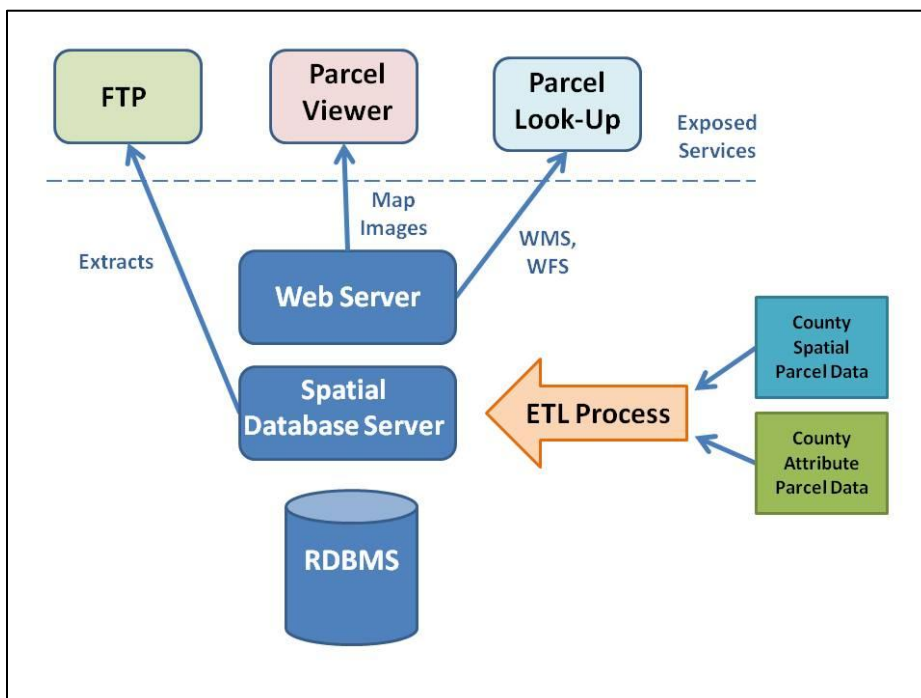
3.3.3 Extract, Transform & Load (ETL)

The process of creating and running ETL routines and workflows is becoming increasingly common in a variety of information technology contexts such as data warehousing. A recommended workflow is described below:

- Source data will need to be obtained from contributors using a variety of methods:

    o Copy of data via automated FTP pull or periodic push

    o Copy of the data via synchronizing or replication

- Documenting its "as-is" format, or encouraging counties export their data into a standard statewide parcel data schema format

- Identifying the target format for the translation

- Developing tools/scripts that will "transform" the data from the "as-is" format into the statewide parcel data schema format. Ideally, the ETL routines are developed so that they can be run in a repeatable, automated way using appropriate ETL tools (e.g. FME, Esri ArcGIS Interoperability Extension) within the county. Similar to the process employed by the MetroGIS, all counties may eventually deliver parcel data to the State already processed and formatted to the state standard. Depending on the format and condition of existing parcel data, transformations will need to address:

    o Coordinate/projection/datum adjustments

    o Feature class and attribute field re-mapping and re-naming

    o Conversion into the statewide parcel data schema format

    o Consolidation of individual tiles/municipal data sets into seamless, countywide data sets

    o Application/correction of polygon topology and unique feature numbering

- Validating that the transformation has been completed accurately

- Assembling individual county data that has undergone ETL into a composite, statewide dataset

It is recommended that the State work toward a parcel data replication model. Under this model, counties would maintain a version of their parcel data in the statewide parcel data schema and updates could automatically be completed through server-to-server replication communications thus reducing the burden on the State.

3.3.4 Systems of Access

One of the most fundamental elements of this program is the assumption that, ultimately, the State's multi-county parcel data collection will be in the public domain. As such, an approach and infrastructure

is needed to make the data publicly available. There are a variety of technologies that can be used to share statewide data sets:

- Providing a *physical copy* of the data for download

- Providing *access* to the data via a consumable web service

- Providing access to the data via a *web viewer* (web-based data viewing application)

While some counties already provide their data via web viewers and are mainly interested in fostering their own user communities, many communities would welcome state support for the hosting of web viewers to help reduce costs to local governments.   Given that the State already publishes other data sets for download, services consumption, and web hosting, it may already have the knowledge and technology in place to store and provide parcel data. This will require a series of decisions on the types of capabilities these services should supply. Potential options include:

- **Data download geographic unit(s)**:
    - Entire data set (eventually statewide) and/or
    - By county and/or
    - By user-defined area (e.g., clipped)

- **Data download format(s)**:
    - Esri format (e.g., file Geodatabase) and/or
    - Simplified Esri format (e.g., SHP) and/or

- **Type(s) of supported consumable services**:
    - Open Geospatial Consortium (e.g. , WMS, WFS)
    - Esri ArcGIS Server
    - KML- Keyhole Markup Language (e.g., for consumption by Google Earth)
    - Cached map/tile-based services (e.g., parcel depictions on top of orthophotos)

3.4   RESOURCE REQUIREMENTS

Resource requirements will evolve during the five year timeframe for parcel data integration. The resource requirements below assume the State will provide implementation plan resources. The process will undergo recalibration at the three year milestone to determine whether the counties are ready (funding, technical support, coordination) to assume some or all of the data conversion processes.

3.4.1 County Resources

Participation in the statewide parcel aggregation project should not demand significant county resources. Participating counties that have digital parcels will be asked to submit them "as is", thus requiring little additional technical skills or resources. Counties that choose to export their data into the state parcel data transfer standard format may need to make one-time data model adjustments and/or data conversion processes thus requiring additional effort on the part of a data analyst and/or

programmer. Counties that choose to implement web services to make their data freely available to the State and others will require staff or consultants to set up and manage the web services. Counties may choose to form regional collaborations to support the maintenance of parcel data and distribution thus reducing the impact on resources for any one county.

3.4.2 State Resources

Given that the State will take on the responsibilities for harmonizing "as-is" data contributions for the pilot project and from early adopters, dedicated staff time will be required to coordinate, obtain, assemble and distribute contributed parcel data. In the near term, utilizing state resources will require development of a conversion process performed at the state level. In the long term, it may be possible to shift the conversion to the county level, requiring modification of the conversion process.

The activities that need to be staffed include, but are not limited to:

- Outreach and communication with stakeholders to identify and develop the statewide parcel data schema and to address any issues/concerns. Initially, substantial effort will be spent coordinating with participating counties and identifying leaders that can help define and refine the processes. Counties that are unable or reluctant to share will require additional outreach and support to help them overcome financial, technical, or education barriers.   After the first year, ongoing outreach will be required to encourage additional counties to participate and encourage counties to move toward developing their own processes to convert data to the standard transfer format.

- The State will need to assign a technical liaison to work with county data providers to collect existing data from participants and document information on existing parcel data services and download capabilities from counties.

- State technical staff will be required to develop and deploy appropriate technology to execute ETL scripts to transform contributed data and deploy and manage the State's own web services for mapping and data access.

Based on the activities described above, it is estimated that, at least initially, the following state resources would be required to implement and support the program. Most likely, these resources will entail the use of staff from multiple state agencies, including, but not limited to MN.IT Services staff at MnGeo. As processes are developed and counties are participating independently, it is likely that resources requirements would be reduced.

STAFFING RESOURCE REQUIREMENTS	
Labor	**FTE**
Program Coordination (outreach, program management)	.5
Technical Liaison (data collection)	.25
Data Processing (ETL)	.5
Technology staff (development, deployment, management)	.5
Total Labor	**1.75**

3.5   STANDARDS

The short term goal for the Business Plan approach is to **accept data "as is" from counties** to encourage the greatest participation possible. The data conversion process to the statewide dataset specifications would happen at the state level. The following list includes some of the many data formats and characteristics that are acceptable in the short term.

- Personal Geodatabase, file Geodatabase, shapefile

- Any clearly defined coordinate system including county coordinates, state plane, UTM or geographic (lat/long)

- Attribute data populated within the parcel data fields, if possible. If not, attribute data provided separately in another format, including comma separated value, tab delimited, dBase (.dbf) or Microsoft Access (.mdb or .accdb).

- For counties that are unable to create or maintain metadata, a minimum metadata record will need to be created by the State to meet the needs of aggregation and synchronization.

The long term goal for the Business Plan approach is to continue to encourage participation and to move toward standardizing the data extract at the county level. Moving the data conversion process to the data source will facilitate a more efficient and potentially more accurate conversion process because the data producers have a better understanding of the local data and the various systems and staff members that need to be coordinated to create the best extraction data product. The data producers are also more aware of changes to the local data that may require adjustments to the conversion process. Moving the conversion process to the data source will also affect a shorter turn-around-time from data acquisition to data publishing.

The following are proposed specifications for the statewide parcel dataset.

Statewide Parcel Dataset Specifications:

- File Geodatabase

- UTM, Zone 15 projection, NAD 83 datum Parcel polygon boundaries with unique parcel IDs For the statewide parcel database, a unique PIN is created by appending the county PIN with the FIPS county ID Parcel points if attribute data is associated with parcel points

- Parcel attribute fields that comply with the state cadastral data transfer standard (currently proposed)[27]. This standard requires that the county ID and parcel ID fields are populated. Populating all other fields is optional. Counties are encouraged to populate as many fields as possible.

- Current metadata in the FGDC[28] or MGMG[29] format.

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[27]http://www.mngeo.state.mn.us/committee/standards/parcel_attrib/Cadastral_Data_Transfer_Standard_for_public_review.pdf
[28] http://www.fgdc.gov/metadata/geospatial-metadata-standards
[29] http://www.mngeo.state.mn.us/chouse/arccatalog.html

- Synchronize schedule of parcel data update to the current MetroGIS Schedule of January, April, July, and October.

4 IMPLEMENTATION PLAN

4.1 IMPLEMENTATION DETAILS

This section presents the recommended tactics and actionable items required to achieve the Vision as described in Section 1.1. The general approach outlined below is intended to address the requirements as well as the unknown factors and risks identified in this Business Plan. The suggested tactics are not necessarily in sequential order of execution. Multiple tactics may be executed at the same time. If resources are not available to support the recommended implementation plan, the State will need to prioritize the tactics described below.

4.1.1 Pursue a pilot project

a. **Identify a small number (3 to 10) of counties to participate in "pilot" parcel data aggregation effort**. These counties should represent a diverse array of capabilities in order to identify the variety of challenges that will arise during full implementation. The following characteristics should be taken into account when selecting a pilot group:

    i. Counties of diverse geography

    ii. Counties with basic digital parcels and attributes *and* counties with complex and rich data sets

    iii. Counties that are part of a regional parcel aggregation group *and* counties that are not

    iv. Counties that do not currently distribute digital data *and* counties that make digital parcel data freely available to anyone

    v. Counties that require data sharing agreements and/or memoranda of understanding

    vi. Counties that have full-time GIS managers *and* counties that do not

    vii. Counties that distribute data themselves *and* counties that use a 3rd party vendor to distribute data

b. **Complete all implementation steps as described below on pilot counties**.

    i. Document procedures, challenges and lessons learned

    ii. Refine processes and workflow accordingly

4.1.2 Execute appropriate data sharing agreements and/or memoranda of understanding

a. Work with the Minnesota County Attorney Association and the State's Attorney General's Office to **develop single data sharing agreement** that could be adopted by all 87 counties and is applicable to all state agencies.

b. **Conduct initial outreach with counties** to confirm willingness of "early adopters".

    i. **Execute required data sharing or license agreements** and document any restrictions that impact the distribution or visualization of that parcel data through state web services.

    ii. **Develop materials that describe the details and requirements of program participation as well as potential benefits**. For counties that are unable or reluctant to participate, develop "marketing" materials that will help educate local decision makers about the program.

c. **Conduct ongoing outreach and communication with counties** to ensure strong initial as well as continually expanding participation.

    i. Establish project website that reports on status of data collection and harmonization efforts

    ii. Disseminate project status updates, success stories and anecdotal benefits through email distribution list or listserv

    iii. Educate about the "true cost" of data distribution for counties

    iv. Visit each county, in person, every 2-3 years to maintain cooperative relationship with active electronic and phone communication in the interim periods

    v. Organize and facilitate periodic regional workshops to report on project status, and provide forum for counties to voice concerns and/or suggestions and learn from one another

    vi. Use regional and statewide GIS groups as points of contact and for dissemination of information

    vii. Meet with decision and policy makers to present and discuss the Business Plan and request spatial and attribute data.

    viii. Provide recommendations and guidance on use of data disclaimers that may accompany the distribution of geospatial data.

d. **Articulate fiscal concerns or other specific requirements of counties if these present a barrier to participation** and determine manner of support that is needed (e.g. financial, technical support, coordination).

4.1.3 Develop data standards and guidelines

a. **Establish statewide dataset model (specifications)** that will store the features and attributes and metadata that will be collected from counties.

    i. Develop initial geospatial and attribute data schema that will act as the container for county data as it is received in various formats

    ii. Update schema as more counties and the State move toward a more robust parcel model

    iii. Document and disseminate schema and provide guidance and assistance to counties who are willing yet unable to conform to recommended schema

    iv. Work with the geospatial community to gain support for passing any needed legislation including the proposed changes to the Data Practices language

4.1.4 Collect, aggregate and harmonize County data into a standard, statewide data set

a. **Evaluate existing state agency efforts that can be capitalized on to support parcel collection, aggregation and harmonization effort.**

  i. For example, look for opportunities to align with existing Minnesota Department of Natural Resources harmonization effort

b. **Evaluate ability to provide support through funding or technical support to counties that do not have ability to participate.**

  i. Identify potential for additional regional aggregation or "counties helping counties"

c. **Identify counties where cost of distribution is determined by 3rd party vendor.**

  i. Acknowledge this barrier to distribution and strategize with the county and vendor for potential work-around to hurdle

d. **Identify required state staff resources and assign responsibilities.** With a relatively short implementation time frame, it will be essential to assign resources that have sufficient time and appropriate skills to conduct the activities described in this plan.

  i. Conduct coordination and outreach with counties and regional entities

  ii. Collect data including execution of data sharing agreements

  iii. Perform extraction, transformation and loading into state data schema including development of automated scripts

  iv. Implement application development including establishing web feature and web map services, web viewers, and data download sites

e. **Create repeatable process for ingesting and processing county data** through ETL scripts that will transform collected data into the basic data schema to create a composite data set.

  i. Evaluate available ETL tools (e.g. FME) for their appropriateness and capabilities

  ii. Conduct significant testing and refinement based on sample data from pilot counties and from all four tax parcel vendors

  iii. Perform continuous validation that ETL scripts are running properly

  iv. Document and train appropriate staff on use of ETL scripts

f. **Commence collection of data** from participating counties and process using ETL tools described above.

  i. Accept "As is" format from counties where this is extent of participation

  ii. Expect more robust data from counties that have ability to provide more

  - Additional attributes

  - Compliance with data standard

  - Complete metadata

    iii.   **Work toward a parcel replication model** in which counties maintain a version of their parcel data in the statewide parcel data schema and updates are automatically completed through server-to-server replication communications.

g. **Document lessons learned and refine processes** based on feedback from participants.

    i.   Document first year benefits for counties that participated and share with other counties

    ii.   Distribute documented benefits to encourage additional participation

    iii.   Consider ways of providing additional assistance to counties to encourage additional participation

    iv.   Investigate additional sources of parcel data (beyond counties) including state and federal agencies that manage lands and associated parcel data within the State

4.1.5 Create centralized data access and data distribution capabilities

a. **Establish a central data repository** for storing county parcel data that is contributed and transformed (see Technical Requirements).

b. **Make decisions and develop detailed technical specifications for data access and distribution, including:**

    i.   Data viewer requirements and potential uses

    ii.   FTP access for data download

    iii.   Web Feature Services (WFS) and Web Map Services (WMS)

c. **Address security requirements for controlling access to data that is not yet freely available.**

d. **Develop the viewers, FTP/download, Web Feature Services (WFS), and Web Map Services (WMS)** according to the agreed upon specifications.

    i.   Conduct appropriate testing on pilot counties

    ii.   Incorporate feedback and make refinements and revisions to data access and distribution tools

ID	BP#	Task Name	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
1		**Phase Years and Milestones**							
2									
3		**Year 1**							
4	4.2.1.1	Identify Staff Resources and Assign Responsibilities							
5	4.2.1.2	Execute Data Sharing Agreements / MOU							
6	4.2.1.3	Develop Data Standards and Guidelines							
7	4.2.1.4	Create Centralized Data Access and Data Distribution							
8	4.2.1.5	Conduct Ongoing Outreach and Communication							
9	4.2.1.6	Pursue Pilot Project							
10	4.2.1.7	Document Lessons Learned, Refine Processes							
11									
12		**Years 2 & 3**							
13	4.2.2.1	Conduct Ongoing Outreach and Communication							
14	4.2.2.2	Execute Data Sharing Agreements / MOU							
15	4.2.2.3	Integrate Additional Counties into Parcel Data Integration							
16	4.2.2.4	Document Lessons Learned, Refine Processes							
17									
18		**Years 4 & 5**							
19	4.2.3.1	Evaluate State Agency Efforts							
20	4.2.3.2	Conduct Ongoing Outreach and Communication							
21	4.2.3.3	Execute Data Sharing Agreements / MOU							
22	4.2.3.4	Integrate Additional Counties into Parcel Data Integration							
23	4.2.3.5	Document Lessons Learned, Refine Processes							

The first year of the project will be focused on acquiring, harmonizing and distributing data from counties that are ready and willing to participate without substantial outreach: Pilot Counties (3 to 10) and counties with data ready for integration.

4.2.1 Year 1

4.2.1.1 IDENTIFY STAFF RESOURCES AND ASSIGN RESPONSIBILITIES

- Assign resources to conduct Year 1 activities

4.2.1.2 DEVELOP DATA SHARING AGREEMENTS / MOU WITH PILOT COUNTIES

- Identify pilot counties

- Conduct initial outreach with pilot counties starting with visits to each county

- Develop program materials

- Articulate fiscal concerns of counties

- Execute agreements

4.2.1.3 DEVELOP DATA STANDARDS AND GUIDELINES

- Develop initial spatial parcel data and attribute parcel data

4.2.1.4 CREATE CENTRALIZED DATA ACCESS AND DATA DISTRIBUTION CAPABILITIES

- Establish a centralized data repository

- Develop technical specifications for data access

- Develop viewers, FTP/download, services

4.2.1.5 CONDUCT ONGOING OUTREACH AND COMMUNICATION WITH COUNTIES

- Establish project website

4.2.1.6 PURSUE A PILOT PROJECT

- Collect, aggregate and harmonize county data into a standard, statewide data set

4.2.1.7 DOCUMENT LESSONS LEARNED AND REFINE PROCESSES

- Document successful strategies and program statistics

- Review progress and adjust as needed

4.2.2 Years 2 & 3: Early Adopters and All Counties

The second and third years of the project will be focused on acquiring, harmonizing and distributing data from counties that are early adopters and counties that have become ready to integrate through outreach. It is possible that not all Minnesota counties will be ready or willing to share data during the initial three year time frame.

4.2.2.1 CONDUCT ONGOING OUTREACH AND COMMUNICATION WITH COUNTIES

- Identify early adopters and other ready counties

- Update project website with status reports on program efforts

- Commence 2-3 year re-visit cycle of each participating county

- Attend meetings with regional and statewide agencies with county representation

4.2.2.2 EXECUTE DATA SHARING AGREEMENTS AND/OR MEMORANDA OF UNDERSTANDING

- Provide recommendations and guidance to encourage data sharing

- Execute Agreements

- Articulate fiscal concerns of counties

4.2.2.3 INTEGRATE ADDITIONAL COUNTIES INTO PARCEL DATA INTEGRATION PROGRAM

- Identify ready counties

- Commence Data Integration – Complete all implementation steps

4.2.2.4 DOCUMENT LESSONS LEARNED AND REFINE PROCESSES

- Document successful strategies and program statistics

- Review progress and adjust as needed

4.2.3 Years 4 & 5: Recalibration of Parcel Data Integration Process

It is expected that there will be counties that did not integrate parcel data during the initial three year period. Late adopter Counties may require additional outreach to decision and policy makers prior to participation in data sharing.

- The Late adopters are counties that do not meet all data sharing capacity requirements, whether technologically or institutionally. Some counties may be among the few that do not yet have digital parcel data, or some may choose not to participate.

The fourth and fifth year recalibration period will require the State to re-evaluate the parcel data conversion process and decide if the State will continue to conduct the conversion process, or if counties will be required to convert parcel data prior to delivery to the State.

4.2.3.1 EVALUATE STATE AGENCY EFFORTS

- Decide if continue with State conducting the conversion process or require counties to convert data prior to delivery to State.
  - If transferring the conversion process to the county level, the State will be required to develop conversion tools or a conversion process with training for the counties
    - Develop a county parcel replication model

4.2.3.2 CONDUCT ONGOING OUTREACH AND COMMUNICATION WITH COUNTIES

- Identify Late adopters Counties

- Develop parcel data transfer mechanisms (tools or training) for counties if conversion process is transferred to the county level

- Update project website with status reports on program efforts

- Visit each Late adopter County

- Continue 2-3 year re-visit cycle of each participating county

- Attend meetings with regional and statewide agencies with county representation

4.2.3.3 EXECUTE DATA SHARING AGREEMENTS AND/OR MEMORANDA OF UNDERSTANDING

- Provide recommendations and guidance to encourage data sharing

- Execute Agreements

- Articulate fiscal concerns of counties

4.2.3.4 INTEGRATE ADDITIONAL COUNTIES INTO PARCEL DATA INTEGRATION PROGRAM

- Continue Data Integration – Completing all implementation steps

  o Or develop tools for county data conversion, or a conversion process with training for counties

4.2.3.5 DOCUMENT LESSONS LEARNED AND REFINE PROCESSES

- Document successful strategies and program statistics

- Review progress and adjust as needed

4.3   BUDGET PLAN

Budget requirements for the Business Plan consist of investments in staff time, initial cost for development of technology and hardware, and maintenance costs for technology during the first three years of the five year program timeline.

The demand on coordination and liaison staff time will increase as more counties choose to participate due to increased numbers and possible increase in the amount of assistance late adopter counties require to provide the data. Data processing and technology staff time is expected to concurrently decrease as ETL scripts and data access technology are deployed following initial technology development.

Budget costs following recalibration during year four could be expected to remain at the levels listed below. Most, if not all, counties will be participating so the funding focus will change depending on the evaluation and recalibration of the State. Conversion could be conducted at the county level requiring tools and assistance to counties, or the State could continue to acquire and convert county parcel data. Ongoing costs for the State would include re-evaluating the ETL process and updating the process as needed.

BUDGET REQUIREMENTS		
Staffing Resource Requirements	**Budget Cost Year 1**	**Yearly Budget Cost Year 2-5**
Program Coordination .5 FTE[30]	$117,520	$117,520
Technical Liaison .25 FTE[31]	$53,560	$53,560
Data Processing .5 FTE[32]	$86,320	$86,320
Technology Development .5 FTE[33]	$107,120	$107,120
Technology Resource Requirements		
Servers – 1 Data Server, 2 Web Servers	$10,000	$1,500
FME ETL Platform	$5,000	
Total Budget	**379,520**	**$366,020**

Software costs are not included in the budget plan. The rates used are the published fiscal year 2012 MN.IT Services technical staff rates which include benefits, overhead and indirect costs.

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[30] $113/hour rate

[31] $103/hour rate

[32] $83/hour rate

[33] $103/hour rate

5 MEASURING SUCCESS & GATHERING FEEDBACK FOR RECALIBRATION

The five year timeline for statewide parcel data integration identifies several key milestones in section 4.2 Phase Years and Milestone Descriptions. The most obvious measurement of success is whether the milestones are being met and whether the effort is progressing according to schedule. The following is a summary of key milestones that will indicate the measure of success for this effort:

1. Complete a pilot project

2. Establish and execute data sharing agreements between state agencies and with counties

3. Develop data standards and guidelines for spatial and attribute parcel data

4. Establish centralized data access and data distribution capabilities

5. Collect, aggregate and harmonize county data into a standard, statewide data set

6. Conduct initial and ongoing outreach and communication with counties

The near term objective for the first three years is to create a working model for acquiring, harmonizing and distributing digital parcel data in a statewide dataset. County participation during this time will begin with Pilot Project counties, then incorporate early adopter counties, and finally include counties that need assistance or greater outreach to participate. Initially, data will be incomplete geographically, and spatial and attribute specifications will be met as each county is able.

The long term objective will occur at the recalibration point at the beginning of the fourth year. The State will need to re-evaluate the parcel data integration effort and decide if it is possible to transfer the conversion processes to the county level (requiring the development of tools and training), or if the State will continue to conduct the data conversion process.

Complete statewide parcel data acquisition, harmonizing and distribution are an attainable long term objective. Digital parcel data exist for nearly every county in the State – a grand accomplishment on its own. It is not unrealistic to expect a vast majority of 90% participation during the five year timeline.

Year 1	3 to 10 pilot counties contribute spatial and attribute parcel data to the State to create the initial statewide parcel data set. Some of the early adopter counties will be ready to contribute data.
	25% of counties contribute spatial and attribute parcel data to the statewide parcel data set

Year 2	45% of counties contribute spatial and attribute parcel data to the statewide parcel data set. All early adopter counties will have contributed data.
Year 3	65% of counties contribute spatial and attribute parcel data to the statewide parcel data set. Some counties will require additional outreach and education to policy and decisions makers. The State will begin gathering information for recalibration.
Year 4	80% of counties contribute spatial and attribute parcel data to the statewide parcel data set. Additional counties will require technical assistance or funding to participate. The State will re-evaluate whether the conversion process will be conducted at the state or county level. If the decision is to conduct as much of the process at the county level, the State will be required to develop tools and training.
Year 5	90% of counties contribute spatial and attribute parcel data to the statewide parcel data set. The majority of counties that have parcel data and a means to distribute the data will participate in the statewide parcel integration program.

Conclusion: Minnesota has a strong base of spatial and attribute parcel data and is well on its way to developing a "data sharing culture". The success of this plan will depend on leveraging existing data, and consistent, effective outreach and education to all stakeholders, focusing on county relationships.

-------------End of Business Plan ------------

Appendices are available as a separate compiled document titled "Statewide Parcel Plan Appendices". The compiled appendices document includes all referenced appendices listed below.

APPENDIX 1: STEERING COMMITTEE MEMBERS

APPENDIX 2: SURVEY OF DATA PROVIDERS

APPENDIX 3: SURVEY OF DATA CONSUMERS

APPENDIX 4: WORKSHOP NOTES

APPENDIX 5: DATA PRACTICES ACT

APPENDIX 6: COUNTY MATRIX