DATCP 2007

Geographic Information Modernization & Integration Plan

Wisconsin Department of Agriculture, Trade and Consumer Protection

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I. EXECUTIVE SUMMARY

The Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP) has a statutory requirement (Wis. Stat. Sec. 16.967(6)) to provide the Wisconsin Department of Administration with an annual plan that describes its geographic information modernization and integration activities. This plan includes activities within DATCP, as well as coordination with external partners. This plan is considered an appendix to the DATCP information technology (IT) plan.

Many DATCP programs collect, use, maintain, and share geographic information in a variety of formats. DATCP has a centralized geographic information system (GIS) infrastructure to support a shared GIS data repository and interactive web mapping applications. Much of 2006 was spent acquiring/creating critical GIS data, populating the data repository, and identifying program data and applications to be migrated to the new infrastructure.

Major activities planned for 2007 include:

- Upgrade ESRI GIS desktop and server software to version 9.2
- Implement a "development" GIS data repository environment
- Migrate existing web mapping applications to ArcGIS Server 9.2
- Develop new mapping applications
- Implement a security infrastructure for Internet mapping applications
- Continue to acquire/develop critical data sets and negotiate data sharing agreements

Design, acquisition, funding, and management of shared DATCP GIS resources are coordinated by the DATCP Agency GIS Coordinator and GIS Technical Committee. Coordination of GIS resources on an agency level mirrors the move toward integration of tabular data and databases within the department, and consolidation of IT infrastructure at the state level. DATCP coordinates GIS activities with partners, whenever possible, and encourages DOA to support the Geographic Information Officer's enterprise GIS coordination efforts.

DATCP programs fund their specific geographic information activities. The Divisions of Animal Health and Agricultural Resource Management have dedicated GIS staff and resources, and have integrated GIS data, tools and applications into their program planning, communication, management, and evaluation activities. The Division of Management Services supports the GIS and GPS needs of the remaining divisions (Food Safety, Agricultural Development, and Trade and Consumer Protection) and the Office of the Secretary. The federal Wisconsin Agricultural Statistics Service, a cooperative effort between the U.S. Department of Agriculture and DATCP, also uses geographic information and GIS tools to support its business needs.

DATCP representatives actively participate on many geographic information and GIS related committees and work groups, including advisory work groups for the DOA Geographic Information Officer. DATCP works with other federal, state, county, and local agencies, utilities, industry, interest groups, and private sector entities to coordinate activities and achieve common geographic information goals. In addition, DATCP continues to be an active participant in efforts, such as the Working Lands Initiative and the Consortium on Biobased Industry, which promote analysis of geographic information to maximize agricultural, environmental and economic returns.

Preparation of this plan was coordinated by the Agency GIS Coordinator (see contact information below) with review by GIS Technical Committee members and others.

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II. ARCHITECTURES

Many DATCP programs collect, use and maintain geographic information to support their daily and long-term planning, communication, management, implementation, and evaluation activities. DATCP recognizes the need to (1) consolidate and share geographic information among its programs and with external partners, (2) pool program resources to support agency GIS activities, and (3) utilize GIS and GPS technology efficiently and effectively. DATCP goals are to:

- Reduce duplication of effort
- Provide more accessible, useable, complete, accurate, and timely data
- Improve program analyses, decision support, communication, and administration
- Reduce GIS related costs

DATCP divisions are the custodians of their geographic information and applications. The abbreviation of the custodial DATCP division (table below) is listed after data and applications, where applicable.

Division	Abbreviation
Agriculture Development	DAD
Agriculture Resources Management	DARM
Animal Health	DAH
Food Safety	DFS
Management Services	DMS
Trade and Consumer Protection	DTCP
Office of the Secretary	OS
Wisconsin Agriculture Statistics Service	WASS

A. Applications Architecture

DATCP desktop, web mapping, and non-GIS applications that incorporate geographic information from tabular databases, GIS layers, GPS, maps, or other sources are listed below. Specific details (e.g., resource requirements, project timelines) for *Future Initiatives* are still to be determined.

WEB MAPPING APPLICATIONS

DATCP has developed a handful of intranet web mapping applications. **In 2007, DATCP intends to hire an LTE or a contractor to help enhance and migrate existing applications and develop new web mapping applications for internal and external customers.** Specific activities include:

- Document DATCP web mapping application development standards and templates
- Migrate existing ArcIMS 9.1 applications to ArcGIS Server 9.2
- Enhance existing Livestock Premises Mapping application
- Create program-specific applications for the intranet (e.g., DFS)
- Implement security infrastructure for internet applications that require secured access
- Develop internet versions of applicable intranet applications for external access

DATCP web mapping applications are described below.

DATCP Intranet Mapping Application (DMS): Prototype ArcIMS 9.1 application that integrates AMANDA data and other tabular and GIS data to promote coordinated program planning and management across DATCP divisions. *Future Initiatives: Internet application to provide access to the public.*

Animal Disease Response (DAH): Secured ArcIMS 9.1 application integrates livestock premises registration, AMANDA, other tabular, and GIS data to identify and respond to serious livestock diseases, and to protect humans from animal diseases. Application is accessible in the Emergency Operations Center (EOC) via the WEM eSponder application. *Future Initiatives: Use GPS and local data (e.g., parcels, livestock) to improve the accuracy of livestock premises locations.*

Well Logs (DARM): Intranet ArcIMS 9.1 application to select and view well construction reports (in PDF) throughout Wisconsin for groundwater quality and quantity issues. *Future Initiatives: Secured internet application to provide access to partner state agencies.*

Lead Arsenate (DARM): Prototype intranet ArcIMS 9.1 application that identifies former orchard locations where lead arsenate concentrations in soil may pose a health hazard. *Future Initiatives: Internet application to provide access to external partners and the public.*

DESKTOP APPLICATIONS

Several DATCP programs use desktop GIS applications to create GIS data, integrate data (e.g., tabular, GIS, GPS), perform spatial analyses, produce maps, etc. These applications support various program planning, communication, management, implementation, and evaluation activities. **In 2007, DATCP intends to review and convert existing ArcVeiw 3.x and ArcGIS 9.1 desktop applications/projects to ArcGIS 9.2.**

DATCP desktop applications are described below.

Aquaculture Program (DAH): Aquaculture activities within the state. Related environmental permitting is coordinated with Wisconsin DNR. *Future Initiatives: Standard data collection procedures to improve the accuracy of aquaculture locations for GIS purposes.*

Humane Officers and Offices (DAH): Trained and certified animal humane officers and their office locations.

Johne's Risk Assessment Program (DAH): Progress of the vaccination program for the Wisconsin milking herd population.

Deer and Elk Farms (DAH): Cervidae farm related activities. Chronic Wasting Disease (CWD) activities are coordinated with Wisconsin DNR. *Future Initiatives: Consolidate permit, CWD, and license databases, and improve the accuracy of farm locations for GIS purposes.*

Agrichemicals in Groundwater (DARM): Pesticides and nitrate in Wisconsin's private drinking water wells and DATCP monitoring wells. *Future Initiatives: Internet application that integrates data from U.S. Fish and Wildlife Service, Wisconsin DNR, and Nature Conservancy for more efficient program management and resource protection.*

Pesticide Management Areas and Use Prohibition Areas (DARM): Pesticide management areas and pesticide use prohibition areas in Wisconsin.

Regulatory Compliance at Agrichemical Sites (DARM): Inspection, investigation, monitoring, and compliance activities at regulated agrichemical sites. *Future Initiatives: Desktop and/or web mapping applications for staff to analyze and integrate data for program management, work planning, and resource protection. Identify data required for emergency response activities.*

Endangered Species (DARM): Pesticide management plans for endangered species and their habitats. DATCP works with landowners and managers to develop plans, which promote modified pesticide use and application methods or alternative pest control. Program activities are coordinated with the University of Wisconsin-Extension and others.

Farmland Preservation Program (DARM): Jurisdictions with exclusive agricultural zoning (EAZ) ordinances and areas covered by a Farmland Preservation Agreement (FPA). *Future Initiatives: Redesign and consolidate tabular databases. Require plan, EAZ ordinance certification, FPA application, and EAZ rezone data be submitted in a standard GIS format. Desktop and/or intranet applications for staff to compare old and new data for program planning, management, and evaluation, and identification of parcels ineligible for farmland preservation tax credits.*

Conservation Reserve Enhancement Program (DARM): Tabular, GIS and GPS data integrated to generate maps and survey descriptions of land under CREP contracts. The tabular database includes conversion, transfer, buyout, violation and any incidental activity related to those contracts, and is linked to WISMART to produce incentive, cost share and staged payments to participants. *Future Initiatives: Work with the State Cartographer's Office and other state agencies to develop a more accurate PLSS reference grid based on county remonumentation.*

Livestock Facility Siting (DARM): Help with Livestock Facility Siting program management, including county and local ordinances, businesses and facilities. *Future Initiatives: Migrate internet application, currently hosted by UWEX, to DATCP.*

Manure Storage and Animal Waste Management (DARM): Tracking of county manure storage and animal waste management ordinances, including permitting requirements, fees, more stringent standards, and local implementation of agricultural performance standards. *Future Initiatives: Web mapping application for staff and public use.*

Land and Water Resource Management Program (DARM): Tracking of county land and water resource management plans, including annual reporting of conservation practices cost-shared through the Soil and Water Resource Management (SWRM) grant program. ArcSDE spatial views are used to link "real-time" tabular data with GIS data.

Nurseries and Christmas Trees (DARM): Plan and track inspections, and manage the program that certifies that Wisconsin's nursery stock and Christmas trees are free from pests and diseases prior to export out of the state. *Future Initiatives: Use GIS to help redefine nursery inspector areas based on nursery locations.*

Gypsy Moth Program (DARM): Monitor and control gypsy moth occurrences in Wisconsin. The Gypsy Moth program uses GIS and GPS technology and applications to track gypsy moth movement in Wisconsin and to assist in accurate treatment. The program coordinates data collection and analyses with the U.S. Forest Service, federal Animal and Plant Health Inspection Service, Wisconsin DNR, and UW-Madison.

Emerald Ash Borer (DARM): Identify and track ash trees for Emerald Ash Borer program sampling and detection activities.

Pest Survey Program (DARM): Monitor regulated plant pests. Surveys are conducted to (1) identify (1) incidences and severities of plant disease and pest outbreaks, (2) pest population levels and trends, and (3) new diseases or exotic pests.

Potato Rot Nematode Program (DARM): Manage the program responsible for inspecting harvested potato crops for nematode infestations, so that potatoes can be certified nematode free to be used for seed purposes. Inspections are conducted at fields going into seed production for the first time and at fields already infested.

Food Safety Program (DFS): Help manage programs responsible for dairy, meat and food inspections. Identify inspector areas and area re-assignments, supervisor areas, local and county food inspectors, licensed businesses, and other activities. *Future Initiatives: Identify critical data and create secured internet application for food chain emergency response.*
Trade and Consumer Protection Division (DTCP): Map consumer complaints for informational purposes.

Agricultural Development (DAD): Maps to help market Wisconsin's agricultural products and services.

Homeland Security and Emergency Response: GIS supports most DATCP homeland security and emergency response activities.

Wisconsin Agricultural Statistics Service (WASS): WASS is a cooperative statistics service between USDA and DATCP. WASS collects and analyzes agricultural production information, and publishes statistics by county or WASS districts. WASS also performs special statistical surveys. GIS, remote sensing, and image processing tools are used for data analyses and publication functions. WASS produces a statewide raster Cropland Data Layer (CDL) which classifies crop and land cover from satellite imagery to augment statistical methods. *Future Initiatives: Identify ways to improve CDL classification and accuracy via collection of "ground truth" data and "smoothing" techniques. Work with the UW and other state agencies to use the CDL layer to update WiscLAND data.*

NON-GIS APPLICATIONS

Some DATCP programs still rely on tabular databases, paper maps, and geographic information in other formats, and do not yet use GIS tools. In addition, most field staff use plat books, Gazetteers, county maps, and other tools for field navigation and activity planning. DATCP non-GIS applications are described below.

Landscape Application Program (DARM): Information about pesticide applications to lawns and landscapes by address. *Future Initiative: Desktop and/or intranet application for staff to identify affected parcels and communicate pesticide application information to neighbors.*

Drainage District Program (DARM): Every drainage district in Wisconsin submits maps of drains and ditch profiles, all of which currently exist in paper format. Landowners are responsible for maintaining drains. *Future Initiative: Convert drainage district maps to GIS format and require submission in a standard GIS format. Desktop or intranet application for program management.*

Agricultural Impact Program (DARM): Agricultural Impact Statements are prepared on public projects, such as pipelines and transmission lines, involving eminent domain. DATCP has custodial responsibilities for the final reports generated by its assessments. Currently, data are manually compiled from a variety of sources. *Future Initiative: Identify critical data and develop desktop application for staff to integrate and analyze data more efficiently.*

INTEGRATION EFFORTS

DATCP has taken steps to integrate both its tabular and GIS-based geographic information and applications. This includes internal integration, and integration with external partners, as possible.

DATCP GIS Data Repository: DATCP maintains a centralized ArcSDE/SQLServer GIS data repository of base map layers, imagery and program data. All DATCP staff using desktop GIS and web mapping applications use this repository.

Shared Information Services: As a state agency, DATCP participates in, and is influenced by, activities and decisions associated with the DOA Shared Information Services (SIS) initiative.

GIS, IT and Program Coordination: GIS, IT and program staff work together on many GIS infrastructure issues.
WEGIS Participation: The DATCP Agency GIS Coordinator is a member of the Wisconsin Enterprise GIS (WEGIS) advisory group for the DOA geographic information officer (GIO). The GIO is responsible for identifying GIS sharing and integration opportunities among state agencies, and defining core GIS services that will be provided as part of the SIS initiative.

AMANDA: The AMANDA database integrates license and related data for several DATCP divisions. AMANDA contains licensee and property information, and identifies multiple licenses and programs associated with a licensee or property. Livestock Premises IDs from the Livestock Premises Registration database have also been linked to relevant AMANDA licensed properties (e.g., dairy producers) to streamline AMANDA license renewal and premises registration notification.

DARM Case Tracking System (CTS): DARM's CTS tracks regulated agrichemical customers and the sites where staff from various programs conduct sampling, inspections, investigations, and other compliance activities.

On-going Program Data Assessment and Integration Efforts: DATCP programs continue to assess their business needs, standardize data collection procedures, improve existing data accuracy and completeness, and integrate data among programs, where possible.

COMPREHENSIVE PLANNING

DATCP has not developed any specific GIS tools or interfaces to assist local governments, counties, and/or regional planning commissions with comprehensive planning activities. Several DATCP program use comprehensive plan data (e.g., agricultural, natural resources, land use, and implementation), or are involved in reviewing agricultural related plans. However, DATCP continues to be an active participant and partner in initiatives which promote analysis of land use options to maximize agricultural, environmental and economic returns. Examples:

- Working Lands Initiative
- Consortium on Biobased Industry
- Promoting Our Wisconsin Energy Resources (POWER)
- Manure Management Task Force
- Livestock Facility Siting
- Farmland Preservation
- Conservation Reserve Enhancement Program (CREP)

BUSINESS NEED FOR COORDINATED ENTERPRISE GIS

DATCP has several business needs which could benefit from the coordination of GIS data, services, tools, and applications among state agencies and their partners. It is assumed that the DOA GIO would have primary responsibility for enterprise coordination among state agencies, including coordination of these activities with recommendations from the Wisconsin Geographic Information Council. Any GIS related services provided by DOA must be: (1) delivered in a timely and efficient manner, (2) supportive of agency business needs, and (3) affordable for state agencies.

Shared GIS Data Acquisition, Access and Storage: One of the most important benefits would be a centralized repository of "official" GIS base layers and imagery with enterprise-level data sharing arrangements. Data would be acquired and managed on behalf of all state agencies, thereby reducing costs associated with duplicate efforts and confusion about which data sets should be used for conducting "official" State of Wisconsin business. A shared GIS data repository would save thousands of hours of agency staff time each year.

Shared GIS Infrastructure: A GIS infrastructure shared among state agencies would provide DATCP with access to additional "environments" (e.g., R&D, development, user acceptance testing, production, transactional versus warehouse) that it cannot currently build and maintain itself. In addition, an enterprise-level ESRI license agreement would save each agency thousands of dollars on GIS software, training and services each year.

Shared GIS Services: Availability of affordable, effective, centralized GIS data, services, tools, and applications would make GIS available to all state agencies. Policies and standards should be developed to simplify and standardize GIS-related processes such as address geocoding, application development, map production, cost/benefit analyses, data exchange, etc…

BUSINESS NEED FOR PARCEL DATA

Several DATCP programs have current business needs for local parcel data. In general, a statewide parcel GIS layer would help:

- Improve accuracies of address geocodes derived from tabular databases (e.g., AMANDA)
- Facilitate program activities associated with specific landowners and/or properties
- Mapping of current zoning for all parcels within the state
- Identify grant, cost-share, and/or tax credit eligibility for specific landowners
- Resolve land ownership for more effective program communication and implementation

In 2007, DATCP intends to begin acquiring parcel data from all counties, including negotiation of data sharing agreements. Ideally, this would be handled as an enterprise activity by the DOA GIO, who would negotiate agreements with counties on behalf of all state agencies.

B. Information Architecture

GEOGRAPHIC INFORMATION

Geographic information data sets created by DATCP programs are stored and managed in various formats (e.g., spreadsheets, databases, maps, GIS layers). DATCP divisions are custodians of the data they create, regardless of format, and are responsible for ensuring the quality and integrity of the data content. Geographic information is referenced to one or more systems – e.g., address, Public Land Survey System (PLSS), parcel ID, x-y coordinates (e.g., WTM91, latitude/longitude). Major DATCP geographic information data sets are described below.

AMANDA (DAH, DARM, DFS, DTCP): The AMANDA database integrates license and related data for several DATCP divisions. AMANDA contains licensee and property information, and identifies multiple licenses and programs associated with a licensee or property. DATCP creates AMANDA GIS data sets by geocoding property addresses or collecting coordinates using GPS.

Livestock Premises (DAH): DATCP generates a GIS data set of registered livestock premises based on address geocodes from the Wisconsin Livestock Identification Consortium (WLIC) Livestock Premises Registration database. Livestock premises data are confidential, and access is restricted by federal and state laws. The data can be used only for animal health related activities and only by individuals authorized by DATCP.

Humane Offices (DAH): Tabular and GIS data for certified animal humane officers and offices.

Private Drinking Water Wells (DARM): Well information and sample results compiled from many different sources, such as DATCP sampling programs, Wisconsin DNR Groundwater Retrieval Network, other sampling initiatives by federal, state, and local governments, pesticide manufacturer studies, and UW system. In most cases, well coordinates are geocoded from PLSS centroids. The Wisconsin Unique Well Number (WUWN) links attribute data to GIS well points. Staff produce statewide GIS data layers and metadata for private wells tested for pesticides and nitrate. Refer to DNR Source Water Protection guidelines on restricting access to detailed spatial data (http://www.dnr.state.wi.us/org/es/science/publications/SS_988_2003.pdf)

Monitoring Wells (DARM): DARM division maintains several networks of groundwater monitoring wells, and is the custodian for monitoring site and sample data for its projects. DATCP reports construction log data generated during well installation to DNR as required by statute.

Atrazine Use Prohibition Areas (DARM): Tabular and GIS data of atrazine use prohibition areas in Wisconsin. Staff produces annual statewide data and GIS layers along with metadata of atrazine use prohibition areas digitized from USGS 1:24,000-scale topographic maps.

Agrichemical Sites (DARM): Tabular and GIS data for regulated agrichemical customers and sites. Tracked sites include farms, greenhouses, spill areas, nurseries, feedlots, commercial businesses, parks airports, golf courses, residential properties, landfills and dumps, soil and groundwater remediation sites and others. Site locations are geocoded from addresses or PLSS descriptions. GPS is used to collect coordinates for some license types.

Endangered Species (DARM): Pesticide management plans for endangered species and their habitats. Staff use Wisconsin DNR Natural Heritage Inventory database to locate endangered and threatened species occurrences, and then collect and maintain program data, including PLSS locations or GPS coordinates, related to these sites. GIS layers are created and maintained using this information. All DNR data and some of DATCP's related data are confidential.

Gypsy Moth Treatment Sites and Trap Locations (DARM): Statewide traps are set each year and located using GPS. GIS layers of trap locations and treatment sites are then created.

Nursery and Christmas Trees (DARM): Tabular, GIS and GPS data for licensed nurseries and Christmas tree plantations. Locations of nurseries and plantations are geocoded from addresses or PLSS descriptions, or collected using GPS.

Plant Diseases and Pests (DARM): Tabular, GIS and GPS data of plant disease and pest outbreaks.

Farmland Preservation (DARM): Tabular and GIS data to administer Wisconsin's Farmland Preservation Law. Properties are identified by tax parcel ID and PLSS. DATCP maintains a statewide GIS layer of exclusive agricultural zoning authorities by county, town, and municipality, as well as rezones by PLSS.

Conservation Reserve Enhancement Program (DARM): Tabular, GIS and GPS data necessary to administer Wisconsin CREP. GPS data of easement boundaries for enrolled properties is collected and submitted to DATCP. Staff verify easements using GPS and GIS tools. PLSS data to the ¼-¼ section level are used for GIS applications and shared with external partners upon request.

Soil and Water Resource Management Grants (DARM): Tabular and GIS data of conservation practices funded by the Soil and Water Resource Management (SWRM) grant program. Data can be analyzed by county or watershed.

Wisconsin Agricultural Statistics Service (WASS): WASS generates the Cropland Data Layer (CDL) annually, and collects information about agricultural production from sample individuals across the state, and provides analyses related to a broad range of agricultural issues. Original data collected from individuals is confidential, while aggregated data is available to the public.

ACCESS & DISTRIBUTION

DATCP is currently developing data access, sharing, and distribution policies for internal and external geographic information and GIS data requests. Most external requests for DATCP data are handled via "Open Records" processes by the custodial division. DATCP data and metadata are distributed by CD, DVD, transfer to portable memory stick or hard drive (provided by requester), or emailed (depending on file size). At this time, no DATCP GIS data or metadata is available through its website, although a few static map files are available for viewing. Examples:

- http://www.datcp.state.wi.us/arm/agriculture/pest-fert/pesticides/atrazine/cnty_list.jsp
- http://www.datcp.state.wi.us/arm/environment/insects/gypsy-moth/have_them.jsp
- http://www.datcp.state.wi.us/arm/agriculture/pest-fert/pesticides/clean-sweep/map_2006.jsp

Once adequate security policies, standards and infrastructure are in place, DATCP intends to make non-confidential GIS data and corresponding metadata available to internal staff via intranet mapping applications. Secured intranet or internet applications will be developed for specific DATCP user groups with clearly-defined business needs for access to confidential GIS data sets. In addition, DATCP intends to make some non-confidential GIS data sets and corresponding metadata available to external partners and the public via internet mapping applications and data download functions.

POLICIES & STANDARDS

DATCP has formally or informally adopted the following policies and standards related to geographic information.

- *ArcSDE GIS Repository Standards:* Naming and structure standards for the DATCP ArcSDE/SQLServer GIS data repository

- *Global Positioning System (GPS) Best Practices:* Standard GPS configuration settings and data collection procedures used by all DATCP programs.

- *WI DNR Locational Data Standards:* Standard geographic data elements and domains. DATCP intends to create a modified version of these standards for agency use in the future.

- *Federal Geographic Data Committee (FGDC) Metadata Standards:* Standards for the structure and content of GIS metadata.

- *GIS Data Sharing Agreement Process:* Documented process for entering into GIS data sharing arrangements with external parties.

In 2007, DATCP intends to develop ArcGIS Server application development standards.

Several DATCP staff are members of interagency workgroups, committees, and associations that address geographic information, GIS and GPS standards issues. The Agency GIS Coordinator actively participates on state agency and inter-agency workgroups that are developing GIS policies and standards for state agencies.

DATCP also has several internal policies that are applicable to technology, application, and/or information access and security.

- Public Records Custodians (#141)
- Sale of Publications and Other Information Material (#145)
- Computer Software, Data Access, and Security Policy (#183)
- Office Automation Software Update (#184)

DATA SOURCES & INTEGRATION WITH OTHER STATE AGENCIES

Several DATCP programs have an ongoing need for geographic information from various sources to support different business needs and applications. DATCP acquires this information from external sources in a variety of formats (e.g., paper maps, text files, spread sheets, database, and GIS layers). Wisconsin DNR is DATCP's primary source for "base map" data sets. Other sources include (but are not limited to) local and county agencies, other state agencies, federal agencies, and UW/UWEX. DATCP does not redistribute these data sets. Instead, requesters are referred back to the source custodian. A few DATCP programs also access geographic information from other sources via internet mapping applications. Examples include (but are not limited to):

Agricultural Impact Program (DARM): Acquires construction plans, paper maps, reports, and GIS data sets from Wisconsin DOT, Wisconsin Public Service Commission (PSC), private utilities, and other sources for utility project assessments.

Foreign Animal Disease Response (DAH): Acquires data in a variety of formats (e.g., GIS, tabular, paper) from a variety of sources (e.g., DNR, USDA, labs, county) to respond to animal health emergencies.

Groundwater Protection (DARM): Acquires Dane County water table paper maps, GIS data sets from the Wisconsin Geological and Natural History Survey (WGNHS), Portage County private well database, GIS data layers from the Portage County Planning and Zoning Office, and well data from University of Wisconsin – Stevens Point (UWSP) Central Task Force Laboratory compiled for groundwater protection activities. Also accesses NRCS internet soil mapping applications for program activities.

In most cases, geographic information integration among state agencies and between state agencies and other governmental entities (i.e., local, county, federal, tribe, UW) should be facilitated and coordinated by the DOA GIO. Currently, the DATCP Agency GIS Coordinator is on the team that advises the GIO about needed GIS data, tools, and services, as well as barriers to horizontal and vertical state agency integration and modernization. DATCP programs can usually acquire most of the geographic information they need, but some significant problems still exist:

Non-existent Geographic Information: Several **statewide** GIS data sets that would be extremely useful for DATCP regulatory and oversight programs are simply not available at this time. Examples:

~ Wisconsin master address list
~ Accurate road network with addresses
~ State-level soil survey attribute tables
~ County and local zoning
~ Parcels
~ Wetlands
~ Updated land use and land cover

Lack of efficient land information sharing arrangements: Several useful statewide GIS data sets exist, but require formal data sharing agreements with other local, county or state agencies to access and use them. The workload involved in coordinating the review and management of a large number of data sharing agreements (e.g., 72 different agreements for county parcels) is significant. GIO facilitation of enterprise GIS data sharing agreements among state agencies and with local, county and federal agencies would reduce redundancy and improve efficiency.

Lack of funding for land information: Several useful statewide GIS data sets exist, but DATCP does not have the funds to purchase or cost-share the data, or to properly maintain and support it. For example, DATCP and WASS identified a potential need to fund additional land cover and land use "ground truth" data in order to help expand the content and improve the usability of the cropland dataset. Enterprise coordination of funding for GIS data and services would greatly increase the "buying power" of individual state agencies.

Lack of standards: The lack of standards for geospatial data models, data formats, and exchange/transfer/load (ETL) processes creates problems for DATCP staff attempting to acquire and use land information from other sources. These problems include the inability to read data from a variety of media (e.g., tapes, diskettes, and email attachments), Internet connection and security issues, and the time spent manipulating acquired data so it can be used by DATCP programs (e.g., multitude of county coordinates systems, converting data for federal reporting).

Requests for DATCP geographic information come from partners and customers at all levels of government, universities, agricultural industry, private sector entities, and others. Recent initiatives, such as Homeland Security, Emergency Management, Livestock Premises Registration, Livestock Facility Siting, Working Lands Initiative, and the Governor's Consortium on Biobased Industry have increased the number of requests.

METADATA

Metadata created by DATCP is developed to meet Federal Geographic Data Committee (FGDC) metadata standards. DATCP custodians use ArcCatalog to develop and maintain metadata for their data sets.

C. Technology Architecture

HARDWARE, SOFTWARE & EQUIPMENT

DATCP has a centralized GIS technology infrastructure that supports a shared ArcSDE/SQLServer GIS data repository, web mapping applications, networked printers, and Centrus Desktop address geocoding software. DATCP programs acquire desktop GIS software to support their business needs. All DATCP ESRI server and desktop GIS software is currently at version 9.1.

In 2007, DATCP intends to conduct the following activities related to GIS technology:

- **review and cleanup existing GIS data sets and consolidate storage on central servers**
- **upgrade all ESRI server and desktop GIS software to version 9.2**
- **upgrade SQLServer 2000 database (ArcSDE) to version 2005**
- **create "development" ArcSDE/SQLServer GIS data repository**
- **implement Network Analyst 9.2 extension**

DATCP GIS technology resources are described below.

Shared Hardware, Software, Equipment	Comments
4 HP Proliant BL20P servers	3 servers (development, intranet, internet); 1 server for ArcSDE/SQLServer
2 HP Proliant DL100 servers	2 servers for GIS data storage
3 ArcIMS 9.1 for Windows	dual-CPU licenses; DARM maintains one of the licenses
1 ArcSDE 9.1	dual-CPU license
1 SQLServer 2000 Standard Edition	database for ArcSDE with dual-CPU license
1 IBM ThinkPad laptop	for GIS demos and presentations
Centrus Desktop	address standardization/geocoding tool
Tape Backup System	
HP Designjet 1055CM Plus large format color printer	networked for agency-wide access
HP LaserJet 5550dtn small format color printers	networked for agency-wide access
5 ArcGIS 9.1 Desktop (ArcInfo license)	floating on license server
Network Analyst extension	server based license

In addition to the agency's shared GIS infrastructure, several DATCP divisions maintain their own GIS, GPS, and CAD software and equipment, such as printers, scanners, digitizing tables, and GPS receivers.

- 10 ArcGIS 9.1 Desktop - ArcView licenses (6 single use; 4 concurrent use)
- 2 Spatial Analyst extension (concurrent use)
- AutoCAD (various versions)
- 1 HP ScanJet 7400C document scanner
- 1 Altek large format digitizing table
- HP Designjet 1050C Plus large format color printer
- HP Deskjet 1220C small format color printer
- HP Color LaserJet 4600dn printer
- ~ 75 Garmin GPS receivers (several models)

TECHNOLOGY ARCHITECTURE VISION

As the number of DATCP programs utilizing GIS technology grows, DATCP continues to evaluate options for making GIS/GPS data, applications, and tools accessible to them. It is anticipated that the vast majority of DATCP GIS users will ultimately rely on program-specific web mapping or desktop applications to support their business needs. More advanced ArcGIS analysis software and equipment will be acquired only when needed for clearly defined business requirements.

DATCP also intends to make appropriate GIS data and maps available to external partners and the public via Internet web mapping applications. Public access, however, requires additional GIS and security infrastructure. DATCP has developed an Internet web mapping infrastructure and prototype security system, and will test these once the migration to ArcGIS Server 9.2 is complete.

Finally, as a state agency, DATCP is affected by SIS and activities of the DOA GIO. It is expected that both SIS and the GIO will influence our future GIS technology architecture directions, especially if/when DOA enters into an enterprise license agreement with ESRI, and opportunities for infrastructure and service consolidation among state agencies is a practical reality.

D. Organizational Architecture

INTERNAL GIS ORGANIZATION

The DATCP Agency GIS Coordinator facilitates and coordinates GIS activities across the agency. This position is responsible for assessing needs, prioritizing activities, strategic planning, developing policies and standards, communicating options, designing infrastructure, and identifying funding for internal, agency-wide GIS activities. The Agency GIS Coordinator also produces GIS data and products for division without dedicated GIS staff and resources, participates on external work groups and committees, and helps identify opportunities for interagency collaboration and integration with external government partners and other public and private entities. This position reports directly to the DMS administrator.

DARM has two dedicated full-time GIS professional positions – one in the Agrichemical Management bureau and one in the Plant Industry bureau. DARM also has around 20 desktop GIS users. Many DARM field staff use Garmin GPS receivers to collect feature locations in the field. DAH has one dedicated GIS professional position, and around 25 GPS users. Weights and Measures inspectors in DTCP also use GPS to collect the locations of several types of features (e.g., vehicle scales). GIS users in program areas coordinate applicable activities with the Agency GIS Coordinator.

DATCP has established a GIS Technical Committee, comprised of representatives from each division. This committee helps the Agency GIS Coordinator identify and prioritize agency-wide GIS needs, and promotes:

- Open communication about GIS issues
- Cooperative funding to acquire and maintain shared GIS resources
- Improved access to, and integration of, shared GIS resources
- Consistent and useful GIS training
- Standardization of GIS data, applications, and infrastructure
- Documentation of GIS data, applications, and infrastructure
- Formal recognition of staff GIS roles and responsibilities
- Collaborative GIS initiatives with federal, state, tribal, and local partners
- Elimination of costs for acquisition/maintenance of redundant GIS resources

Bureau of Information Technology Services (BITS) staff maintain DATCP's centralized GIS technology infrastructure, including server, backup, and network environments. The Agency GIS Coordinator works closely with BITS staff on GIS infrastructure activities.

The number of requests for GIS data, tools and applications from DATCP divisions without dedicated GIS staff or resources continue to increase. These requests are currently handled by the Agency GIS Coordinator and an LTE.

Finally, DATCP is in the process of redesigning its intranet pages, which will include new GIS and GPS related pages and links for internal users. **Creation of GIS and GPS content and related documents for the DATCP intranet pages will be a major activity in 2007.**

DATA SHARING

DATCP employs informal and formal data sharing techniques. Because an enterprise data repository has never existed, DATCP, like other state agencies, has developed informal data sharing arrangements with external land information partners and customers.

DATCP enters into formal geographic information sharing arrangements, as necessary, to acquire or provide data. Most of these data sharing agreements are with county, state, or federal agencies, and

allow DATCP to acquire and use land information for internal purposes, while prohibiting DATCP from redistributing the information to other external partners or customers. For example, DATCP has data sharing agreements with several counties for DOPs, and with Wisconsin Public Service Commission (PSC) for transmission line data. DATCP has documented the process by which data sharing agreements with external parties are signed, in order to ensure consistency and coordination within the agency.

ORGANIZATIONAL BENEFITS OF COORDINATED ENTERPRISE GIS

Integration of geographic information data and services among state agencies should, for the most part, be facilitated, negotiated, and coordinated by the DOA GIO. Possible organizational benefits include:

- A centralized data repository and enterprise-level data sharing agreements would simplify DATCP's ability to acquire data from external sources and reduce workload associated with developing and maintaining its own GIS data repository and data sharing agreements.

- Consolidation of GIS infrastructure, tools and services would generally reduce DATCP's workload and resource needs - *assuming the chargeback mechanism is cost-effective for DATCP*.

- Policies and standards would increase consistency among state agencies and reduce workload and resources associated with data exchange, transfer and conversion, data sharing during emergency situations, etc.

TRAINING

DATCP staff participate in GIS training in a variety of ways. Some use on-line training. Others attend instructor lead training classes held by UW Land Information and Computer Graphics Facility (LICGF), ESRI, other state agencies, and private vendors. DATCP has also hired contractors to provide in-house training on various technical GIS topics, and, in one case, invited other state agency staff to participate. DATCP would benefit from cost-effective GIS training coordinated for state agencies by the DOA GIO.

E. Security Architecture

DATCP uses state and industry standard database, network, user account, application, and other security measures to maintain secure IT and GIS infrastructure, systems and data, as appropriate. All DATCP internet pages include links to the agency's legal notice, privacy notice, and acceptable use policies.

DATCP has also developed a prototype Internet security system to support its Livestock Premises Mapping application which uses confidential livestock premises data. This security supports access of the application via WEM's secured eSponder web application in the Emergency Operations Center (EOC) during exercises and real emergencies. **In 2007, DATCP will test and implement this security system with web applications migrated to ArcGIS Server 9.2, and make it available for other production DATCP Internet web mapping applications.**

As with all state agencies, Wisconsin's "Open Records" regulations and other external and internal policies about public versus private data guide DATCP's data sharing and information security activities. Some information kept by DATCP is confidential by statute. By statute, confidential records generally include the following:

- Wis. Stat. ss. 94.64(6m) - grades or amounts of fertilizer sold or distributed
- Wis. Stat. ss. 95.232 - information identifying owners of livestock herds infected or suspected of being infected with paratuberculosis
- Wis. Stat. ss. 95.51(5) - livestock premises registration information
- Wis. Stat. ss. 95.60(7) - information identifying the type or number of fish or fish eggs bought, raised or sold by a privately owned fish farm or the supplier or purchaser of those eggs
- Wis. Stat. ss. 97.22(10) - information that pertains to individual milk producer production, milk fat and other component tests and quality records
- Wis. Stat. ss. 126.84(1) - contractor financial statements and purchase, storage and procurement records under the agricultural producer security program
- Wis. Stat. ss. 94.50(6) - certain records relating to cultivated ginseng transactions
- Wis. Stat. ss. 94.68(6) - pesticide information which qualifies as a trade secret
- Wis. Stat. ss. 94.72(6)(a) - feed tonnage reports
- Wis. Stat. ss. 96.10(3) and 96.20(5) - individual business information obtained pursuant to a marketing order or marketing agreement
- Wis. Stat. ss. 97.20(3m) - dairy plant producer lists

Access to legally protected land information and GIS data sets (e.g., livestock premises data) may be further restricted by statute, and/or data sharing, confidentiality or non-disclosure agreements.

The DATCP Agency GIS Coordinator is also a member of the Wisconsin GIS Interagency Workgroup for Emergency Management. This workgroup is charged with identifying issues and activities associated with GIS data sharing in emergency situations. This workgroup recognizes that some GIS data sharing arrangements may need to be handled differently in emergency versus non-emergency situations.

DATCP continues to review its existing internal policies related to technology, application and information security. Many of these policies were adopted before DATCP had centralized GIS capabilities, and may need to be updated to address issues related to GIS data, technology, applications, and products. The agency intends to develop and document business rules, policies, and standards to clarify GIS-related security issues. The goal is to simplify access to GIS data sets within the agency, while, at the same time, protecting the information from unauthorized access, use, distribution, and/or disposition.