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Summary

This document will provide an overview of non-academic GIS work completed by the Wyoming Geographic Information Center (WyGISC) under various agreements with Real Estate Operations (REO) from FY2004 through FY2012. While a large portion of this work has been with REO, projects with other Division of Administration departments and non-administrative groups have also been completed. In addition, WyGISC has worked with the administration of various university departments outside the Division of Administration.

The partnership between Real Estate Operations (REO) and the Wyoming Geographic Information Science Center (WyGISC) was established to facilitate the management of UW real estate related data, communicate UW real estate issues, spatially enable property holdings and provide for maintenance and tracking of land records and related data using ArcSDE (spatial data engine) technology.

The current goal of the partnership with REO is to continue development of an Enterprise GIS (EGIS) for the Division of Administration to facilitate data sharing and analysis. Development of Division of Administration’s EGIS using current technology has continued with ongoing database design, schema modeling and application development. Data sharing has increased within the Division as more data has been added to the centralized database and access granted to said data. Additionally, applications which allow individuals to view and query data have been made available via the WyGISC GeoData Applications secure data portal.

Under agreements with REO, WyGISC has worked with other Division of Administration departments as well as groups outside the Division of Administration. Within the Division of Administration this work has been primarily with the Physical Plant. Several applications including the Utilities Viewer and Lease Maintenance Viewer have been made available via the GeoData Applications Portal and provide access to utility and related data that have been added to our centralized database. Other groups WyGISC has worked with include Facilities Planning, Environmental Health, and institutional Analysis. A draft version of an Emergency Response Campus Map Application that allows for viewing AED and emergency phone locations was recently developed.

Non-Division of Administration work has also been supported by the agreements with REO. This work has focused principally on analyzing student data and creating maps to demonstrate student demographics for various departments. The projects have included working with the President’s Office, Student Affairs, the College of Business, the Law School, the College of Education, Wyoming School University Partnership and the UW Foundation.
Funding from outside of the Division of Administration was received by WyGISC as part of an agreement with the Agricultural Experiment Station. Under the first phase of this agreement WyGISC was charged with organizing and make accessible GIS data for SAREC via a secure data portal. The proposal for the second phase of this agreement is almost complete. The second phase will allow for similar GIS data access for the Agricultural Research Stations (AES) at Laramie, Powell and Sheridan as well as facilitate field season planning for all AES.

Campus Enterprise GIS Coordination has been another aspect of WyGISC’s non-academic work. WyGISC continues to promote and demonstrate the many ways GIS can be integrated into the work flow of various departments on campus. A campus enterprise GIS would improve efficiencies, decrease data redundancy and provide for standardization of GIS data across campus for non-academic units. Additionally, such work is a stated action item within the UP III.

### Real Estate Operation Projects

#### Summary of Completed Tasks:

Work with REO has centered on spatially enabling REO's real property data and implementing tools and web-based applications to streamline REO's work flow. This work initially focused on populating the GIS with spatial and aspatial data. This was followed by migrating the data to a centralized database that allows for multiple user viewing and editing. Current work focuses on building secure web based application to provide easy access to data by REO and other administrative groups.

#### Real Property GIS and Related Work:

- **Phase I** - Pilot study of west campus to determine necessary features classes and design the first iteration of the GIS database schema (FY2004-2006)

- **Phase II** - Spatially enabled UW Lands Database including real property buildings, acquisitions, disposals, easements and leases for Wyoming and U.S (FY2004-2008)
  - Populated database with necessary aspatial data including: dates, grantee/grantor, lessee/lessor, prices, metadata etc. (FY2005-present)
  - Digitized real property documents including deeds, leases, agreement, associated photos (FY2004-present)
  - Populated metadata for all GIS data (FY2007-present)
  - Standards
    - Developed standards that can be used as a framework to insure CAD and GIS data created by outside entities would be compatible with internal UW databases

**Phase III** - REO GIS data maintenance, application development and Campus Enterprise GIS Division of Administration development
o GIS Database Management/Maintenance (ongoing)
  ▪ Perform QA/QC and maintenance of data
  ▪ Update database schema/design
  ▪ Maintain layer files and relationship classes
  ▪ Maintain database versioning
  ▪ Maintain Archiving/Historical Markers
  ▪ Maintain metadata for feature classes

o Server/Software Maintenance (ongoing)
  ▪ Maintain hardware and operating system servers containing data and applications for REO and other groups
  ▪ Migrate servers to new IT facility
  ▪ Maintain software
  ▪ Manage permissions groups to facilitate access to data
  ▪ Update as necessary
  ▪ Resolve database issues
  ▪ Continue work with GIS/CAD interoperability and research new technology developments associated with ArcGIS 10

o Toolbars internal to GIS Software (FY2008)
  ▪ Toolbar to allow for easy viewing UW real property data
  ▪ Township, range and section finder

o Web Applications
  ▪ Deployed MyWyGISC secure portal (FY2008-FY2010)
  ▪ Deployed WyGISC GeoData Applications Portal (FY2011)
Figure 1. New GeoData secure web portal provides access to applications.

- Real Estate Viewer Version 3.0 (FY2008–2010) – This web-based secure application allows for the viewing and querying of real property parcels and related data including photos, leases and agreements by REO and UW administrators

Figure 2. Real Property Viewer (REV) accessed via Applications GeoData secure portal.

- Campus Control Network Viewer (FY2008-2009) – Used by engineers preparing to survey locations on campus
• Campus Map: Building and Parking Viewer (FY2006) – Allows for viewing and querying buildings and parking on campus

Figure 3. Campus Control Network viewer allows for viewing survey marker locations and related data.

Figure 4. Campus Building and Parking Viewer allows the public to view available places to park on campus.
Retired applications:

- **ReViewer** – This was the original application that allowed for the viewing of REO’s acquisition and disposal data. This application was superseded by the Real Estate Viewer which uses newer technology.
- **Construction Viewer** – This application contained current building footprints, CAD data for new construction, photos and related documents.

![Figure 5](image.jpg)

**Figure 5.** This application allowed for viewing current construction on campus including related CAD data.

- **Email Customizations (FY2007-present)**
  - Lease expiration date notification system - Implemented automatically generated lease notification e-mails that contain information about expired leases and leases coming due as well as links to the lease documents.

**Mineral Rights GIS Database Development**

- Designed GIS database for mineral rights held by UW including the ability to reference and query financial data related to mineral right leases (FY2008-present)
- Migrated data to centralized database to allow for multiple user access and editing (FY2009)
Other Division of Administration Projects Supported by REO Agreements

Physical Plant (PPL)

- Designed database for PPL’s electrical conductor data (FY2006)
- Designed database for Utilities Master Plan (UMP) data and populated centralized database (spatial data engine) that can be accessed by multiple viewers and editors
- Update data schema as necessary (FY2009-present)

Applications

- Campus Utilities Viewer (FY2010-present) - This web-based secure application accesses UMP data allows for the viewing of spatial utilities data including water mains, gas lines, electrical data, storm and wastewater

- Electrical Data Viewer (retired 2009) - This application allowed for viewing electrical conductor data collected in 2004. This application is superseded by the Campus Utilities Viewer which uses the new data collected for the UMP

Figure 6. Available via the Applications GeoPortal the Campus Utilities Viewer allows Physical Plant employees access to detailed information about all utilities.

- Lease Maintenance Viewer (FY2008 – present) - Allows Physical Plant employees to view who is assigned various maintenance tasks according to individual UW leases including both maintenance and financial responsibilities
• Parties responsible for utilities, building systems, general maintenance and capital improvements maintenance can be identified using the application.

Figure 7. Available via the Applications GeoData Portal permitted administration employees can view maintenance responsibilities outlined in the current lease.

Facilities Planning
  o Help develop location code for use by all Administration departments when referencing UW buildings (FY2006)
  o Campus Control Network Viewer - developed a web-based application for viewing information about survey markers on campus (FY2008)

Emergency Response / Environmental Health and Safety
  o Helped with Emergency/Evacuation Planning (FY2008-present)
    ▪ Populated centralized database with emergency phone and AED locations
    ▪ Developed methods to help update AED Unit and Emergency Phone Data via an ArcGIS Mobile project that deploys on hand held GPS units with ArcPad software
    ▪ Developed interoperability methods to view and update CAD buildings plans in GIS and vice versa
    ▪ Applications
      • Developed an application that can be used to update AED data on our server using a hand held GPS unit
Emergency Response Campus Map – Web-based application that queries AED and Emergency Phone Data. Allows for viewing emergency phone locations and floor plans with building evacuation .pdf image

Campus Mapping Coordination
  o Met with Institutional Marketing, Institutional Communications, TransPark, Facilities Planning and Real Estate Operations (FY2011)
    ▪ Discussed creating maps with a uniform look at feel for visitors, new students, parents and employees
    ▪ Discussed possibility of centralized GIS database to help maintain map consistency

![Emergency Response Campus Map](image)

Figure 8. Location of AED units and emergency phones can be identified via the Emergency Response Campus Map.

Institutional Analysis
  o Worked with Institutional Analysis (IA) to obtain enrolled student data for use in mapping student demographics (FY2008-present)
  o Collaborated with IA on work for President’s Office Maps (see below)
  o Created map of UW Statewide Service Activities
Work Supported by REO Agreements for Other Divisions

**Presidents Office**
- Analyzed student "15 day" data and created maps for use by the President’s Office as well as in Trustees meetings (FY2009-current)
  - Incoming Freshman
  - Current Enrolled Students (Wyoming and National)
  - Wyoming Community College Transfer Students
- Created wind potential map for the Y-Cross Ranch (FY2010)
- Created maps of resident and non-resident undergraduate tuition and fees for public doctoral institutions (FY2011, in progress)

**Student Affairs**
- BannerSCT – Met to discuss how to provide for data compatibility between Banner and related GIS (FY2008)
- Provided geodemographic maps of students enrollment data (FY2008-2009)
- Mapped "15 day" data (FY2008)
- Presented twice to Enrollment Management Committee information on the availability of GIS resources and capabilities in general and at WyGISC in particular (FY2011)

**College of Business**
- Enrollees Map (FY2009)
  - Used demographics to pull Utah based recruiters to UW and show how many UT students and Western WY students are enrolled in UW

**Law School**
- Created various maps to help in recruiting and viewing demographic data on students (FY2008-2009)
  - Mapped Law School website visits
  - Mapped recruitment areas
  - Mapped admitted students
  - Mapped ethnicity of applicant pool

**College of Education**
- Created map showing geography of all College of Education alumni (FY2010)

**Art Museum**
- Created maps for use in Wyoming Invitational Sculpture Exhibit (FY2008)

**Wyoming School University Partnership**
- Helped with mapping WSP events that have occurred around the state (FY2010)

**UW Foundation**
- Helped map the geographic location of UW alumni (FY2005)
- Created Maps of Planned Giving and Major Gift prospects (FY2011)
Agriculture Experiment Station Support

- Agreement for signed between WyGISC and SAREC for Phase I in which WyGISC will enable access to SAREC GIS data, GPS and aerial photo imagery data via a web-based application for the purpose of facilitating research and field management activities at SAREC (FY2011)
- Agreement in progress for Phase II to enable access to GIS data for Laramie, Powell and Sheridan Research Stations via a web-based application
- Phase II will include developing an application for station directors to facilitate field season plot assignment (FY2012)
- The GIS database implementation and data access will served as a demonstration project that can be applied to other UW Research and Extension Centers in the future
- Helps meet the goals of UP3 and WyGISC to foster and support collaborative science across a wide range of disciplinary domains
  - Worked with Dave Claypool to obtain all GIS data collected to date for SAREC
  - Currently migrating data into a centralized database

Campus Enterprise GIS Coordination

Over the last three to four years, WyGISC has been working toward advancing a framework for a Campus Enterprise GIS. To date, a number of steps have been taken to begin promoting the coordinated, sustainable use of geographic information systems (GIS) for administrative, management, and service-related purposes throughout the University of Wyoming. These steps included:

- Completion of a report titled, “Creating a Campus GIS Coordination and Technical Services Program at the University of Wyoming” (2008) that outlines a the vision to, “To promote, integrate, standardize and advance the utilization of geographic information systems (GIS) for administrative, management, and service-related purposes throughout the University of Wyoming
- Executive Council Presentations (FY2008)
  - Discussed how GIS technologies can be used across campus especially within the work flows of Administration, Academic Affairs and Information Technology
  - Discussed the need for strategic coordination and technical support
- Worked with Division of Administration groups to increase division wide data sharing (FY2009)
  - Real Estate Operations
  - Physical Plant
  - President’s Office
- Identified additional potential campus users (FY2008-2010)
WyGISC Non-Academic GIS Activities

- Held meetings with and presented to various groups to discuss potential implementation of GIS within their work flows
- Potential stake holders can be found Appendix B
  - Meetings were held with other groups on campus to discuss the possibility of implementing GIS into their work flows (FY2009)
    - Student Affairs
    - Outreach School
  - Maintained and promoted use of GIS data interoperability standards (ongoing)
  - Provided front line technical assistance using ESRI support when necessary (ongoing)

These activities and a growing recognition of the importance of supporting administrative GIS efforts on campus lead to Action Item #77 in the recently adopted University Plan III: “...Vice President for Administration and the director of the Wyoming Geographic Information Science Center will implement an agreement to support a standing role for WyGISC in administrative applications of geographic information systems (GIS), possibly involving several vice-presidential division. This agreement should recognize the importance of GIS to UW's role in research and economic development.” Discussions toward this effort have been initiated and will continue through FY2011, with anticipated participation from a wide range of non-academic interests across campus.

Budget Summary

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*Note: Cost to UW for ESRI annual software site license is approximately $21,000

**Budgets do not include WyGISC in-kind contributions primarily for computing and systems administration
Appendix A: Map Gallery

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Appendix B: Campus Spatial Information Stakeholders

Appendix C: WyGISC Background

The WyGISC is an interdisciplinary research institute at the University of Wyoming focused on research and development, education, and outreach associated with geospatial data representation, access, visualization, analysis and modeling. The mission of WyGISC is to advance the knowledge and application of geographic information science and technology through research, education, and service. WyGISC aspires to become a premiere interdisciplinary academic center in geographic information science research and education, while strengthening our unique leadership role in service and outreach to the university, state, and region. Examples of our work can be found at www.wygisc.uwyo.edu.