Campus Enterprise GIS
University of Maryland

Enterprise GIS Initiative: Webmapping

Cross Platform Supported:
Topics

- Making the Case for Enterprise GIS at UMD
- Esri Resources Available to UMD
- Webmapping for Information Access
- Demonstration: Public Campus Webmap Prototype
- ArcGIS Online for GIS Resource Dissemination
- Demonstration: ArcGIS Online & Specialized Applications
- Future Development Plans
Geography is a Common Context for Information

*Everything is somewhere*

- Events
- Facilities
- Stadiums
- Roadways
- Bus Stops
- Utilities
- Trees
- Streams
- Green Spaces
- Construction Areas

...and is somehow connected!
A Geographic Information System (GIS) is a system for the Management, Analysis, Visualization and Dissemination of Geographic Information...

... for effective, timely, and efficient collaboration, problem solving, and decision-making.
An Enterprise Mapping System

- Scalable, extensible, reliable, and secure
- Open, interoperable, and standards based
- Simple (ideally) and effective integration within the institution
- Delivers a high return on investment
What does an Enterprise GIS do that Google Maps can’t?

Security handled by the Central Authentication Service (CAS) permits controlled editing and limiting access to sensitive information.

We “control” the data representing UMD, including level of detail mapped and information content.

No data size constraints.

Timely updates based on UMD’s needs.

Easily integrated with other University information systems.

Can integrate Google / Bing / Esri and MD iMap data layers.
Authoritative mapping content...

- Assurance of accuracy, internally regulated update cycles, and direct control over how the university is represented to the public

- Otherwise, with externally produced unmanaged mapping (e.g. Google Maps, Bing Maps) there is a significant risk of being misrepresented or even causing harm through inaction
Why Esri?

- UMD Site License
  
  $45,000 annually for premium Access, Training, and Support

  - Using resources already paid for!
  - Expanding and enhancing programs already in place!
  - Leveraging new time-saving templates!
Directly Usable Esri Resources

- ArcGIS Online Groups / Organizational Site
  - Easy map creation and sharing
    - Comments, Ratings
  - Group management
    - Privacy controls
  - Public Maps Gallery Template

- ArcGIS for Facilities Management
  - Campus Basemap Template (LGIM / Web Basemap)
  - Campus Editing Template (LGIM / Desktop Tools)
  - Campus Viewer Template (Web Application)
Why should campus mapping resources be centralized?

- Make decisions based on authoritative information
- Improved partnerships and collaboration between academic and administrative units
- Ability to integrate systems and data from across the organization
- Institutionalized processes and expertise
Standing up a central enterprise GIS is more cost effective than standing up multiple GIS servers / RDBMSs at the department level in terms of licensing costs, hardware, and technical support staff.
Current Campus Mapping Features

Features by Facilities Management Include:

**Buildings**
*floor plans, footprints, room and space inventories*

**Hardscape**
*roadways, sidewalks, pavers, parking lots, athletic fields, structures*

**Environmental**
*wetlands, water bodies, forested stands, trees and landscaped vegetation*

**Utilities infrastructure**
*lighting, cameras, emergency phones, fire hydrants, underground delivery networks*

**Topographic**
*1-foot elevation contours and surveyed elevation points including buildings*
Who’s using FM’s GIS Resources?

- NextBus Shuttle UM Tracking System
- Field-Based Parking Lot Inventory and FM-DoTS hybrid parking lot and parking type GIS datasets
- Campus Bike Rack Survey

Department of Public Safety

- Police Dispatch and Event Tracking System
- PERT Phones

Other Departments:

- Sustainability
- Division of Information Technology
Making Campus Mapping more Accessible and Actionable

- Exposing foundational campus basemap information to the campus community

- Maintaining a centralized web-accessible system that allows real time data access and collaboration through the shared mapping platform and linked information systems
Maps are outdated as soon as they are printed.

Few campus maps are publicly available and are not easily adaptable to users’ needs.

The campus population is a “tech-enabled” population with mobile computing at their fingertips. They expect a solution that matches their lifestyle.

An interactive digital map will enhance the campus’s image and engages students, staff, and visitors.
Planning For The Future

- Printed Maps are static and outmoded
- Students and visitors expect greater access to campus information
- Use of Mobile Devices and Tablets is on the rise
- We are a population no longer “tied” to our offices or desks for information
- Mobile access offers solutions that you can take with you and provides instant answers to your question or needs
High Level Overview of System

- Manage asset information
- Facilitate better planning and analysis
- Get information into and out of the field
- Provide comprehensive view of operations
- Engage constituents and customers
- Geo-enable other systems (e.g. calendars, class schedules)
University Benefits

- Improved data access
- Accuracy assurance
- Ability to create a campus-wide data catalog
- One official look and feel

Security
- Security is improved and assured
- Supports CAS

Data

Hardware
- Reduced cost since each department does not need a GIS server

Esri
- University already has a Site License
- Free training/support

Overhead
- Time to create redundant data is removed
- Timespan from idea to final product is reduced
- Maintenance of multiple systems removed
Benefits By Stakeholder Group

Visitors
- Enhanced Campus Experience
- Campus Walking Directions
- Highlight Points of Interest
- Real Time Campus Data

Students
- Custom Map For Your Schedule
- Find Events On Campus “What's going on near you?”
- Room to Room Navigation
- Use your Mobile Device To Flag “An Issue” On The Spot

Emergency Services
- Accurate Building Information
- Current Campus Conditions
- View Event Locations To Plan Staffing
- View Details from Campus Wide To Room Specific

Faculty / Staff
- Time and Cost Savings
- Work Order Integration
- Improved Asset Management
- Better Informed Planning Decisions
- Find / Book Conference Rooms

Accessible and Actionable Campus Data
Flexibility

Use The Microsoft Office Suite

To Create Documents To Share
A department/group can create a map with a range of available data
1. Public: Layers from Google, Esri, governmental agencies, MD iMap and other sources
2. Semi-public: Data created by UMD departments designated for university community use
3. Private: Data not shared between departments or beyond user groups

Layers can be added / removed and the display of the information can be modified
1. Locational or attribute queries to limit results
2. Color of features or degree of visibility
3. Labeling or symbol used to identify feature
Sewer Line
Length: 7.2'
Diameter: 6"
Slope: 3.2%

Water Valve
ID: 12454
Depth 15.3'

Sewer Manhole
Depth: 12"
1in / 1out

Water Line
Length: 7.2'
Diameter: 6"
Community Engagement

Targeted Messaging

Volunteered Geographic Information (VGI)

Twitter/Ushahidi

311

• SMS
• E-mail
• Twitter
• Browser

... Provide actionable information & integrate feedback
Making Mapping more Accessible and Actionable

Campus Webmap Development
Direct Benefits

- Enhanced campus basemap
  - High-level cartography

- Identification and quantification of campus features and landscape types
  - Facilitates easy creation field-based asset surveying and framing of features in a broader spatial context

- Expanded and enriched datasets through collaboration with other departments
LIVE DEMONSTRATION
What is ArcGIS Online?

A cloud platform where anyone can...

...make, share and host maps and apps
ArcGIS Online Configuration

- Logo and name
- Custom URL
- Featured maps
- Gallery
- Basemaps and default
- Web app templates
Customize Default Basemaps
Application Templates
Embedding Web Maps

- Copy and Paste HTML
  - No programming
- Easily Control Access
LIVE DEMONSTRATION
Next Steps?

1. Get support and buy-in from Campus Administration

2. Create Campus GIS Steering Committee:
   Identify key issues for further development with an understanding that GIS will be the driving force and integration point for other information systems

3. Develop Proof-of-Concept Interactive Campus Map into a ready to use Public Campus Map

4. Publish Public Campus Map (map.umd.edu)

5. Provide access to and invite additional campus groups to participate in established system
Next Steps?

Through the Campus GIS Steering Committee Task Forces:

- Identify and involve key campus stakeholders and system facilitators
- Design and implement system infrastructure
- Identify and prioritize key mapping applications and data requirements
- Maintain development, staging, and production environments
- Streamline interdepartmental communication and data sharing (database centralization and consolidation)
- Test for performance, scalability, and security
UMD’s *future* Enterprise GIS

- A collaborative effort to create a centralized campus management system

- Ability to link all campus databases (with full security control)
  - Integrated collection and archiving schema
  - Improved accessibility and scheduled backups

- Built using internal resources and expertise
  - Staff, Faculty, and Students
UMD’s future Enterprise GIS

- Identify a need
- Collect, organize & exchange data
- Transform data into actionable information
- Get information into and out of the system
- Disseminate knowledge where & when it’s needed

Meeting the needs of Campus Students, Staff, & Visitors
Enterprise Benefits of GIS will be Realized

Connecting systems and stakeholders across the University

- More timely access to more accurate information
- More and higher quality communication
- Better decision making tools
- Increased operational awareness
- Enhancements to existing management and information dissemination systems
QUESTIONS

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