The Enterprise Implementation of GIS
The Enterprise Implementation of GIS

1. Quick Successes
2. Educate
3. Easy to Use
4. Future Trends
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Quick Success

☑ Each year will determine the success of your initiative

☑ Guarantee support from managers, directors, and elected officials

☑ How to “showcase” your successes

☑ Leverage press and media coverage

☑ Show successes and progress continually
The Town was up for the NFIP CRS Rating

Needed to improve its ability to determine flood status
SOLUTION

- Digitized key information
- Produced Requisite Mapping
- The comparison gave a quick and accurate record of properties that were located in flood zones
SAVE TIME AND MONEY

- CRS was reduced by two points. Annual saving to citizens of over $500,000 annually

- The Town was able to save time and money, as GIS allowed the process of comparison to be reduced from 30 minutes per parcel to 5 minutes. Save 100s of hours a year.
Leverage Existing Investments

- Case Study
- Calvert County, MD
- Integration of GIS and Existing Databases
  - Black Bear Permits and Inspections Database
  - Microsoft Access Solid Waste Customer Database
  - Munis Utility Billing Database
  - OSSi Police Records Management System
  - Fire Programs Fire Records Management System
Preparedness and the Tsunami Resilient Community

City of Unalaska: Base Sea Level + 30 Feet
Preparedness and the Tsunami
Resilient Community
City of Unalaska: Base Sea Level + 50 Feet
Preparedness and the Tsunami Resilient Community

City of Unalaska: Base Sea Level + 100 Feet
City of Unalaska: Base Sea Level + 100 Feet
On December 8, 2004, the Malaysian freighter Selendang Ayu went aground and broke in half at Skan Bay off Unalaska Island in the Aleutian chain. The accident sent 336,000 gallons of oil and 66,000 tons of soybeans into the water and onto the shores of the island. Six crew members died during a rescue attempt. State and federal agencies immediately sprang into action to minimize the damage and loss of life caused by the wreckage and the spill.
Mock Ship Accident - Wildlife Shoreline Survey Results

Oil Slick

Black oystercatcher’s Not Affected by oil

Gull oil covered
Mock Ship Accident – Dead Wildlife Locations

Oil Slick
GPS/AVL Enabled Vehicles

- Track vehicles
- Route preplanning
- Identify areas to avoid
- Know where other emergency vehicles and critical assets are located
Kidnapping

- National Map of All Kidnappings
- Track the location of known insurgents
- Optimize protection patrols
VIP Routing Plan

- Thwart would be assailants
- Track routes by time and route
- Map motorcade and patrol logs
- Don’t travel down the same road at the same time
Motorcades and VIP Protection

- Tracking
- Visibility analysis by motorcade/patrol
- Visibility analysis by security forces monitoring motorcade/patrol
- Threat analysis from snipers to deny firing points
Oil Asset Protection

- Asset Inventory
- Vulnerability Assessment
- Map Past Insurgent Incidents
- Optimize Protection and Troop Location by Time of Day
Border Security

- Protecting Critical Facilities - Airport
- Seismic and Acoustic Sensors
In Vehicle GPS
- Small GPS on their keychain, pocket, or as a watch
- Long battery GPS – when in range of a GPS base such as the one in the car they will not activate. When out-of-range they activate thus making for long battery life

RFID Tag in clothing - Radio Frequency IDentification uses radio frequencies to track people. Close range.
- The government of Mexico has surgically implanted the chips, the size of a grain of rice, in the upper arms of staff at the attorney general’s office in Mexico City. The chips contain codes that, when read by scanners, allow access to a secure building, and prevent trespassing by drug lords.
GPS on Persons

Section 3: The Enterprise Implementation of GIS
The Enterprise Implementation of GIS

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Educate

- How to best educate your entire organization
- Guarantee support throughout your organization
- How to make GIS indispensable for your agency
- Outsourcing vs. in-house education
- Select the best tools i.e. newsletters, user groups, conferences

Section 3: The Enterprise Implementation of GIS
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**Educate**

- Formal training
  - In-house
  - Vendor
- Newsletters
- Users Groups
- National Conferences
- One-on-one meetings
- Revisit the master plan
• **Multiple tiers of use:**
  – Power Users
  – Analyst Users
  – Browser Users

• **All organizations have multiple users with multiple needs**

• **GIS is now accessible to everyone in an organization**
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Easy to Use

- How to deliver the right tools to the right person
- Remove obstacles to GIS use
- Task specific solutions
- How to make GIS useful and easy-to-use
- New GIS tools to ensure enterprise-wide use
- GIS Applications with little training

Network Centric Tools
Desktop GIS
Web Browser
If it’s not easy to use, they won’t use it.
Analytical and Predictive Tools

Section 3: The Enterprise Implementation of GIS
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Cloud Based Solutions – 311GIS.com

There are two interfaces to 311GIS.com: a citizen portal that allows the input of complaints, issues or problems and a government toolkit interface for managing requests.

Functionality.
Citizen Interface - Government Toolset

WAYNE COUNTY, NC
Park Equipment
Request ID: 0001001
Request Status: Opened
1. Opened at 11/14/15 1:11 PM
2. Closed at 11/14/15 2:22 PM

WAYNE COUNTY, NC
Road Sign Repair
Request ID: 0001002
Request Status: Opened
1. Opened at 11/14/15 1:11 PM
2. Closed at 11/14/15 2:22 PM

CITIZENS CAN ACCESS 311GIS.COM THROUGH THEIR SMART PHONE, TABLET, OR HOME COMPUTER.

SEE A PROBLEM REPORT A PROBLEM

1 CREATE REQUEST
2 SUBMIT REQUEST
3 TRACK REQUEST STATUS
4 VIEW COMMENTS

Section 3: The Enterprise Implementation of GIS
Citizen Notification

Section 3: The Enterprise Implementation of GIS
City of Ames Public Works
Capital Improvement Plan Interface for the Public

2014/15 - WATER SYSTEM IMPROVEMENTS

This program provides for replacing water mains in areas that are experiencing rusty water problems. It also provides for installing larger distribution mains in areas that have a high concentration of 4" supply lines, transferring water services from 4" water mains in streets where larger water mains exist, and abandoning 4" water mains. Eliminating duplicate water mains, where possible, improves water flow and helps reduce rusty water. Installing larger distribution lines in areas that have a high concentration of 4" supply lines and less than desirable fire-fighting capacity (predominantly in the older areas of the community) provides larger supply quantities in relation to the current and proposed land uses, in accordance with the Land Use Policy Plan.

The system currently has 13.6 miles of active 4" water main. Improvements to these water mains will result in reduced maintenance costs.
Story Maps

City of Naples
Interactive Walking Map
City of Greenville Public Art Walking Tour

"Paradigm Pathway," created by artist Stephen Kishel of Bluffton, SC, is dedicated to the late Bud A. Malick, a lifelong Greenville resident, in appreciation of his support and love of the arts. The abstract steel and aluminum sculpture pays homage to Mr. Malick's collection of nationally-known contemporary art.
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Ten Year Forecast of Trends

• GIS has evolved significantly since its inception
• Radical changes in software, databases, hardware, data creation methodologies, and end-user demands
• Keep an eye on the future
• Many local governments fail to do so
• They do not have a readily available path to implement the latest tools
• The expense of having to jump from old GIS technology to new is too onerous
• They are forced to continue with their antiquated tools
• The organization almost has to start over in order to modernize their GIS
• Should pay close attention to industry trends
GIS in the Cloud and Software as a Service (SaaS)

- Oracle, Google, Amazon, Yahoo, and Salesforce.com have spearheaded the trend of enterprise grid computing using low cost hardware and software that enables virtualization and dynamic provisioning of resources.
- Google has shown that this infrastructure is excellent for building scalable, and highly available, geospatial services that provide a rich user experience.
- Esri has recently embraced this concept.
  - They have partnered with Amazon to make ArcGIS Server available via Amazon’s Compute Cloud (EC2).
  - Instead of installing and maintaining local instances of ArcGIS Server on premises, customers can launch ArcGIS Server on EC2 instances with ArcGIS Server preconfigured for them.
  - This is in its early adoption phase and has been slowed as Esri decides on how best to offer true SaaS solutions.
  - It is anticipated that many organizations will move to their GIS to the cloud over the next decade.
The Town of Windsor identified the initial users for year one of the project:

- Public Works (5)
- Town Manager’s Office (1)
- Admin Services (1)
- Parks and Recreation (1)
- Planning (1)
- GTG Admin (1)
Utility Applications
Utility Consumption Applications
Web Services and Data Sharing

- Although already in existence, web services and data sharing are just in their infancy.
- The push in the GIS industry now is to make GIS data shareable and available.
- Esri’s software currently allows users to consume data from external feeds.
- ArcGIS Online is a cloud-based geospatial content management system for storing and managing maps, data, and other geospatial information.
  - Built on Esri's cloud infrastructure, it gives users access to geographic content shared and registered by Esri and GIS users around the world.
- Over the next decade, GIS users will transparently be consuming data provided from any number of sources.
Enterprise Integration

- GIS, as the integration tool for local government, has been heralded for many years
- The idea is that GIS becomes the portal into all databases within an organization (spatial and non-spatial)
- Integration between GIS, work management, asset management, outage management, and customer information systems is a desire of local government
- Utilizing a GIS address layer as the de-facto address database serving all non-spatial applications
- This has not been and will not be an overnight process
- Strides have been made over the past few years
- Local governments have begun to make integration a mandatory component of any new software system acquisition
- Software vendors are upgrading their software to meet this demand
- Over the next decade, this trend will continue
- Local government will inch closer and closer to accessing all of their enterprise data through a GIS front-end
Low Cost Spatial Data Collection Tools and Digital Data

- The cost of data collection has plummeted over the past decade
- Tools have advanced, giving the ability for local government to acquire or collect much more information
- Data collection methods and data availability will continue to expand
- Local government GIS staff will need to integrate the ever increasing volume of data to include:
  - Radio frequency identification (RFID)
  - Automated meter reading (AMR)
  - Digital imaging cameras
  - Airborne and terrestrial LIDAR
  - Remote sensing satellites
- An ever increasing volume of digital data will be consumed via the GIS
Citizen Notification

- Public safety has led the way of late in implementing applications that will notify citizens if a crime occurs within a certain distance of their
  - Houses
  - Schools
  - Places of worship
- Citizens are beginning to expect this type of information to be emailed, texted, or automatically phoned to them
- GIS is utilized as the method of geo-enabling an existing database and juxtaposing the event in the database with the citizen’s location of concern
- The demand for this type of information will continue to increase
- It will be expected that a local government will notify its citizens when a change of any type is occurring around them
  - Wayne County, North Carolina provides its citizens with the following information based on a user’s geography
    - Geo-enabled crime
    - Inspection
    - Nuisance abatement
    - School/restaurant sanitation grade
Mobile GIS

- Mobile computing has exploded over the past few years
- Tablets and smartphones like the iPad, iPhone and Android devices now have applications available for products like Autodesk Mapguide
- The proliferation of smartphones will help increase the pressure on software companies to continue to produce mobile applications
- As computing power and capability increases for such devices, so too will the number of software companies offering mobile solutions
- Expect all GIS software companies to offer their core software on these mobile devices
- A majority of GIS end user applications will become untethered from the traditional personal computer
Methods & General Information

Tools for Pilot Project

- **Sub-foot Data Collection (Water, Sewer (except manholes) Features)**
  - Trimble Yuma 1
  - Trimble Pro6H Antenna
  - Esri’s ArcPad Software

- **Survey Grade Data Collection (Manholes)**
  - Topcon GRS-1
  - Topcon GR-5
  - Topcon GPS Software

- **Tablet Based Collection and Editing with ArcGIS Online**