



ICMA 90th Annual Conference

From Assessments to Implementation:
Getting Started in GIS



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Presentation Outline

- Introductions
- GIS Components
- What can GIS do for your Community?
- Needs Assessment Overview
- Needs vs. Plans
- Questions & Answers

Introductions

- Graham S. Hayes, Ph.D., Red Oak Consulting
 - National GIS Practice Leader
 - 20+ years of programming and GIS implementation experience







All Communities Experience Outside Pressures Uniquely





What's going through a Community Manager's mind...

The Red Oak Communities of Practice

- Information Technology
- Organizational Effectiveness
- Outsourcing/Regionalization
- Financial Services
- Security Services



Pathways to Lasting Solutions




Relevance...

Spare tires, gas cans & jumper cables...

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What is a GIS?

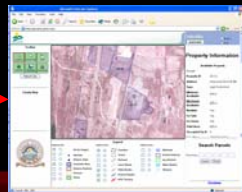


Map Graphics
(spatial data)



Tabular Databases
(attributes)

Computer software which combines maps and databases . . .



... into user consumable, meaningful **information**

Five Parts of a GIS:



GIS Allows Us to Query Spatial and Attribute Data

- What exists at or near a particular location?
- What areas meet certain criteria?
- What is adjacent to this location?
- What has changed since?
- What spatial patterns exist?
- What if?

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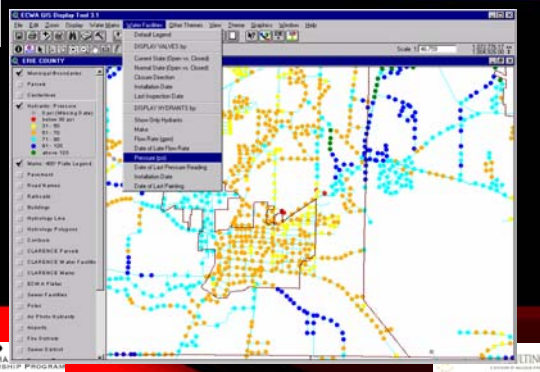
Basic Goals & Benefits of a GIS:

- Build a shared GIS database available to all departments
- Provide better access to information for decision making
- Enhance communication and cooperation between departments
- Increase efficiency in current operations
- Provide analytical mapping capabilities not currently available

Municipal Applications for GIS

- **Facility & Asset Management**
 - interior or external holdings (building floorplans, structures, pipelines, cemeteries, vehicle fleets, etc.).
- **Zoning & Site Selection**
 - property valuation with spatial filters (near, adjacent, within, etc.).
- **Routing and Logistics**
 - efficient and cost effective delivery of goods and services.
- **Market Research / Economic Development**
 - demographics, customer & employee base profiling.

GIS for Utility Asset Management

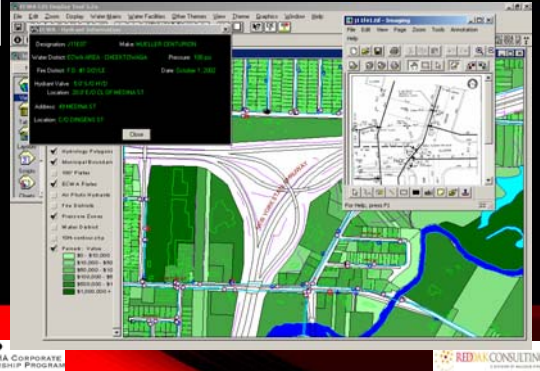


GIS Field Data Entry Panels

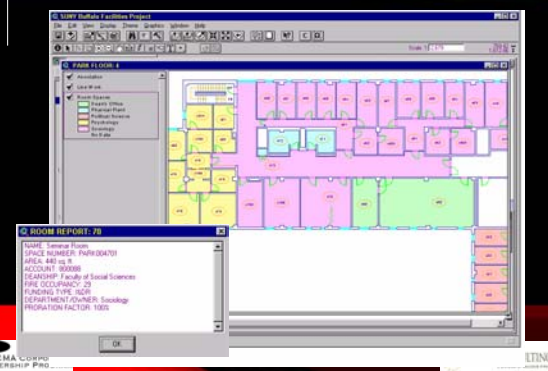
- Sign Inventory
- Road Conditions
- Hydrants & Valves
- Water Mains
- Manhole Inventory
- Sewer Capacity
- Building Permits
- Bridge Inspections
- Property Assessment

The screenshot shows a data entry form for a sign inventory. The form includes fields for 'SIGN ID', 'SIGN ID#', 'HEIGHT', 'INSTALL', 'LOCATION', 'ATTRIBUTE', 'CONDITION', 'SUPPORT MTL', 'BASE TYPE', 'BACKING', and 'SHEETING'. There is also a section for 'SIGN ACTIVITY' with columns for 'DATE', 'ACTIVITY', 'INFO', and 'COMMENT'. A small image of a traffic sign is displayed on the form.

Integrating Mainframe & Image Data

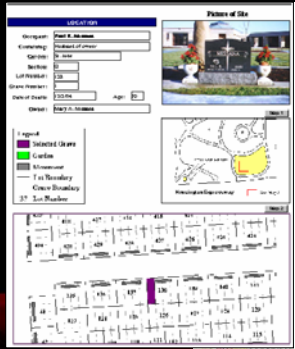


GIS for Facilities Management

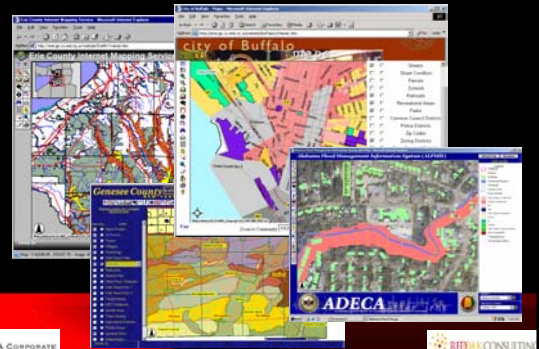


Cemetery Management Systems

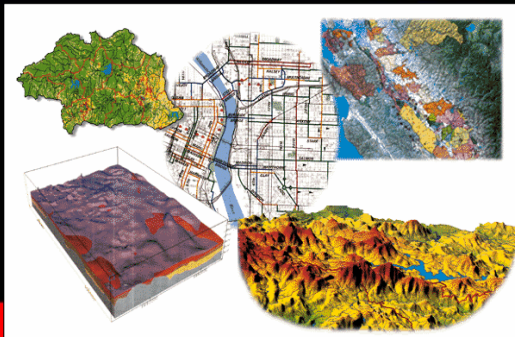
- Data Entry
- Work Orders
- Queries and Genealogy Searches
- Maps & Directions
- Infrastructure Management



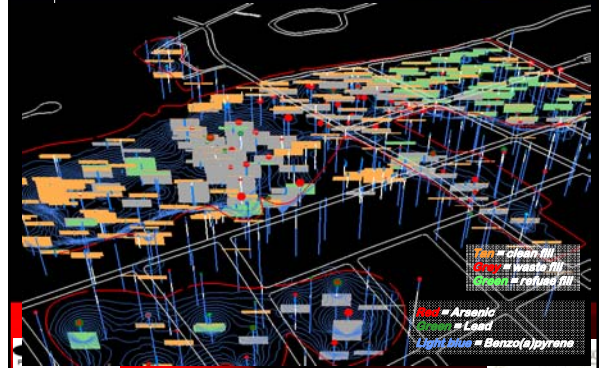
GIS for Public Access to Maps



GIS for Data Visualization

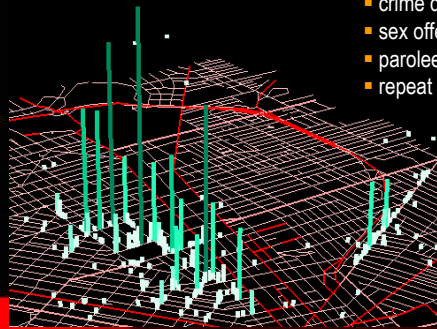


Landfill Stratigraphy & Geochemistry

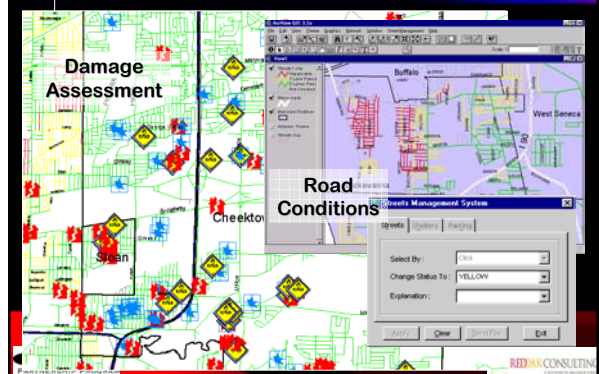


GIS for Public Safety & Security

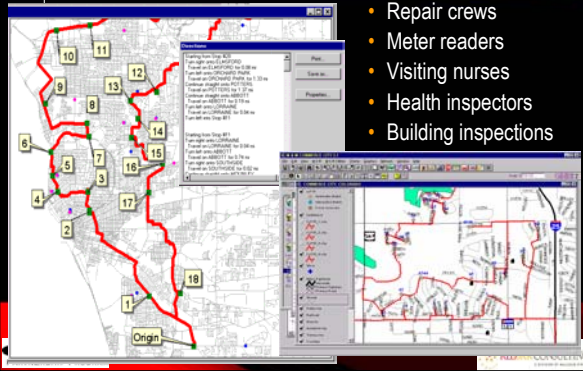
- crime density
- sex offenders
- parolee locations
- repeat offenders



GIS for Emergency Response Support



GIS for Optimal Vehicle Routing



Municipal Applications for GIS

Bottom Line...

- If something has a **location** (lat-long coordinate, address, room number, shelf location, etc.)
- And it has **attributes** that describe it (age, cost, utility, condition, status, part number, size, etc.)
- Then **GIS** can be used to...
 - Create and display data
 - Derive and analyze information
 - Manage resources and facilities
 - Make informed decisions

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Why do a Needs Assessment?

- **GIS is often implemented without plans**
 - **Grass roots** efforts (project databases)
 - Rapid growth in the field leads to individuals "in charge" who have inadequate experience
- **Repeating bad history**
 - Not enough attention paid to **Software Engineering** experiences (both good and bad)
 - **Errors are repeated** over and over
- **Needs & Design are often done poorly**
 - End user education is **lacking**
 - **Data-centric** vs. function-centric
 - **No cost estimates** – trust in technology
 - No recommendations or plan – **just a report**

Needs Assessment Study Purpose

- A requirement study allows an organization to assess:
 - what they need
 - what they have
 - what they can afford
 - how they should proceed
- **Educational opportunity**
- **Enhances success through ownership**

Needs Assessment Components

- Educational Seminars
- Questionnaires
- Interviews
 - Group / Department
 - Individual
- **Compilation / Report Documents**
 - **Application Descriptions**
 - **Master Data List / Data Dictionary**
 - Prioritization and Use Matrices
 - Cost Spreadsheet
 - Master Application List

Who should be interviewed?

- Choose people with a clear understanding of department job roles and responsibilities
- Choose people you trust and respect their opinions
- Choose someone who is not afraid of computers or change
- Apply the 10-80-10 rule

10-80-10 - Who should define the needs?

- People can be classified into 3 groups
- Innovators
- Maintainers
- Inhibitors

10-80-10 - Who should define the needs?

- Innovators (10%)
 - Visionaries
 - like change
 - see the big picture
 - pie-in-the sky applications
 - always looking for faster cooler applications

10-80-10 - Who should define the needs?

- Maintainers (80%)
 - just doing their job
 - don't like change
 - willing to adapt if the arguments are compelling
 - rarely ask for changes in applications

10-80-10 - Who should define the needs?

- Inhibitors (10%)
 - fight against change
 - unwilling to adapt even if the arguments are compelling
 - unwilling to provide information for applications
 - seem to rise to positions of power

10-80-10 - Who should define the needs?

- So what do you do ???
 - Educate Management when they select the team for interviews
 - Be prepared to deal with difficult people
 - Try to find common interests, likes, dislikes, etc.

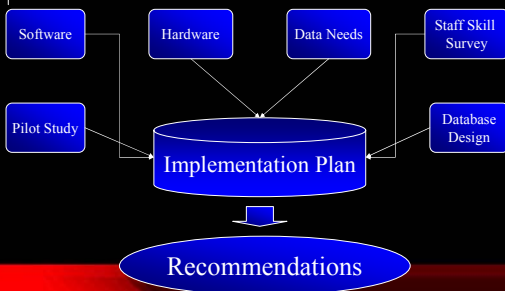
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Gap Between Needs and Plans

- Needs Focus
 - What they **Have** ?
 - What they **Need** ?
- Plan Focus
 - **What** they should do ?
 - **Why** they should do it ?
 - **When** they should do it ?
 - **How much** will it cost / save to do it ?

GIS Needs Assessment and Implementation Plan



Traditional Needs Assessment Asks:

- What departments could use GIS?
- How are maps and databases used in these departments?
- What map products or functions (applications) are needed?
- What data is required to feed those applications?
- How is data shared between departments?
- What data exists and in what form?

Plan-centric Needs Assessment Asks:

- Which applications are most **important**?
- How **often** would the GIS be used or accessed?
- What time / cost **savings** would be realized for each use?
- How **critical** is the data required to feed those applications?
- How should costs be **shared** between departments?
- What will it **cost** to convert the critical data?

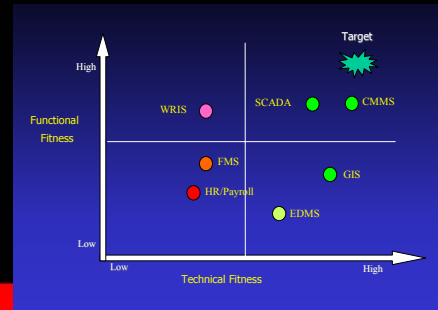
Plan-centric Questions

- **Prioritized** applications?
 - High, medium, low
- Anticipated **use** by user?
 - Daily, weekly, monthly, quarterly, yearly
- Estimated **cost savings** per use?
 - Seconds, minutes, hours, days

Plan-centric Questions

- **Importance** of the Data?
 - Critical, functional, nice to have
- **Hardware** specs for existing equipment?
 - 486, Pentium II, Pentium 4
- **Training** to raise comfort with computers?
 - Basic PC classes, database design, GIS

IT Fitness Assessment



Estimated Frequency of Use & Potential Savings

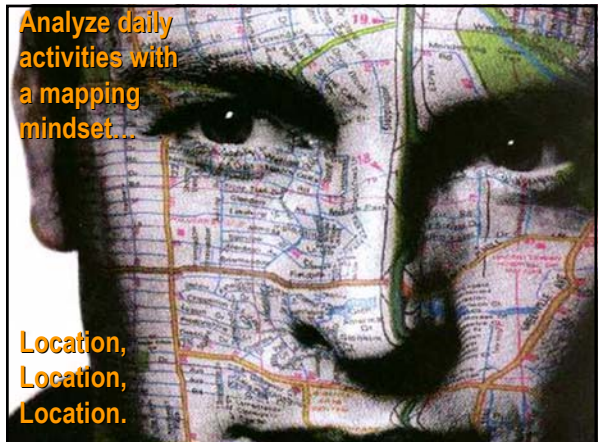
- Assumptions:
 - 260 work days / year (-20 for vacation time)
 - 2,080 hours / year
 - \$ 30,000 / year average annual salary
- Example:
 - User accesses the GIS 2 times / day
 - User saves approximately 20 minutes looking for documents, paper records and maps.

Estimated Frequency of Use & Potential Savings

- Results:
 - 2 times / day x 240 days x 20 minutes saved / use
= 160 person hours (4 weeks) / year
 - \$ 30,000 / 2,080 * 160 person hours / year
= \$ 2,300 savings / year

Analyze daily activities with a mapping mindset...

Location, Location, Location.



What defines a Successful GIS Implementation?

- How are maps and databases currently used?
- How much time and effort is devoted to map maintenance activities?
- Organizationally, who is responsible for maintaining digital data?
- What GIS functions are required?
- How will GIS blend into the overall workflow of divisions?
- How the organization addresses staffing/training needs
- How does the GIS fit in the computing framework?
- How do organizational processes support data management?

Plan-centric Approach

- **Prioritized** applications
- Anticipated **use** by department
- Estimated **cost savings**
- **Cost sharing** between departments?
- **Cost estimates** for
 - hardware & software
 - data conversion
 - application development
 - training
- **Prioritized implementation schedule**

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Questions & Answers

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