

INDUSTRY TRENDS AND ANALYSIS GROUP

SEATTLE, WASHINGTON 2004



ITAG FINAL REPORT 2004

SEATTLE, WASHINGTON

GEOSPATIAL TECHNOLOGY REPORT

GITA has published its sixth annual *Geospatial Technology Report*. The report, published in April 2004, contains detailed information on the completeness, complexity, and direction of geographic information system (GIS) projects being implemented at 204 infrastructure-based organizations.

The 133-page report has been completely revised and updated and includes market share analysis, five-year trend analysis, project expenditure information, and much more. This year's expanded analysis resulted in a 46% increase in length over the previous report. The report is divided into six industry sections: electric, gas, pipeline, public sector, telecommunications, and water/waste/stormwater. It provides cross-industry analyses as well as detailed information on individual industries.

The report provides valuable insights for those wanting help to justify a new project, increase funding for an existing project, expand the use of geospatial technology to the enterprise, or just add a new application. It can help readers manage change by monitoring what their peers and the industry as a whole are doing. Use it as a benchmarking tool, to help plan for the future, and to validate current projects.

GTR SUMMARY FROM INDUSTRY BREAKOUTS

How can we increase the response rate to the GTR survey? We want to achieve 500 participants to improve statistical reliability of trends analysis.

- Provide a ticket to a webcast for the responder
- Provide data from last year's form so the responder need only enter changes in data
- Remind the responder on a regular interval to complete the form. Insert your company name and address in place of the text on the cover page by clicking once and typing.
- Don't restrict to just GITA members
- Include or perhaps partner with other agencies such as AGA (American Gas Assn.), EEI (Edison Electric Institute), OGC.
- Advertise more -- consider advertising in other industry-related magazines
- Publicize the "value" of the info (ROI, staffing, etc.)
- As we continue to grow the report, specifically target the Top 10 industry issues identified
- Consider affiliation with professional benchmarking organization (such as TBE)
- Give every member and non-member a survey
- Give the respondee a small gift for filling out the survey
- Have each moderator promote the survey at their session

- Make it a focus at the Annual Meeting
- Get OGC involved with the survey
- In the top ten list we need to be more descriptive in what the lists are talking about. The listing is too vague, we need an explanation next to each of the topics.
- Vendor encouragement (vendors encourage their customers to participate)
- Web-based/online form (more convenient) sent via email, with embedded link to the survey
- Available for attendees to complete during the conference (e.g., at the cyber café)
- Clearly identify the benefit to the user (for completing the survey and receiving a copy of the report)
- Respondents should get free copy
- Increase number of people to be included (are responses only requested from GITA members?) Broaden the audience.
- Assure all verticals giving access in multi-vertical organizations (one response per organization may not cover every vertical under one company)
- If you are a multi-utility organization, list the contact that works within each vertical
- Use mailing list from other associations
- Get information from purchasing staff (may be critical people that are not tapped into within an organization for response)
- Develop register of organization managers who can get the surveys out (and completed)
- Who's involved with organization's GIS (do we know)?
- Provide other incentives for participation (discount to conference, sponsorship vouchers, T-shirts, etc.)

What will increase the use of the GTR to users? To vendors?

- Provide a summary of contents with a teaser "what's in it for me?"
- Provide the list of companies responding
- Market the report outside of the GITA community
- Giving examples of use
- Tying to business cases
- Use as a reference document (for business case, or for presenting to a new vendor)
- Use for driving requirements for software integration, etc.
- Educational institutions for curriculum/program development
- Use for defining new standards
- Provide "executive" level summary
- Provide report in usable digital format, with ability to edit
- Have some PowerPoint slides already prepared

- Have some ground rules for use; must have GITA logo on slides

User

- Provide real-time examples to the report
- Provide case studies if possible
- Ask the users on the survey what will make the survey more useful to them?
- Many have not seen the report
- This question has the same concerns as question A (the increased response question), who is getting the report
- MEMBERS ONLY access to GTR on the web
- Include a copy with the GITA membership
- Advertise that the GTR has been published

Vendor

- Get the raw data to the vendors and increase the price for this data.
- Provide info with clear benefit, especially to the end users
- Trending information is VERY useful
- Capture the business value of the survey in a statement on the first page of survey (sell users on the importance right up front)
- Value to telecom is a harder sell than electric (for example), where cooperation is critical (less obvious in a more competitive industry like telecom)
- Do the survey at the conference, associate completion with perks, like entrance to President's Reception (e.g., "completed survey ⇔ open bar")
- Use for market research

Should we consider adding questions on annual budgets? More granularity on spending data?

- Requiring additional budget information will reduce the willingness to complete the report and runs counter to the effort to increase the response.
- Additional granularity is too difficult to interpret budgets to be useful. Companies' organizational structure allows budgets to be spread across multiple departments.
- No to more; yes to more granularity
- User companies don't really find the current level of information of much use and are reluctant to give it out because they know vendors will start calling. Vendors care about money spent, both inside and outside the companies.
- It is difficult to get meaningful numbers without very carefully crafted questions.
- Questions must be better defined (include whether or not dollars are 'loaded'----do they include labor burden or other additions?)

- When you compile the finished report, give better information about the number of responses to different ranges
- Correlate dollar ranges to size of company
- Ask participants to identify where other technology dollars are spent (ERP, mobile data, etc.)
- Add more info on spending habits.
- What kinds of needs has your organization identified for budget spending?
- How much money are you cutting back on?
- Have you received any grant money? How much? From where?
- What are your conversion costs? How does that compare to your person work needs (FTE)
- Tiered survey, which dials down for the user and vendor community.
- No—it represents nothing unless you know more information about an organization. Just seeing dollars spent will not tell you overall impact to an organization.
- Add under software section what discipline the software is being used for – is it facility management, document management, integrity management, etc.
- Hardware needs to be more generic – don't need to know manufacturer or how many.
- Also need to ask the question if they use an RDBMS and if so, which one, Oracle, Informix, SQL server, etc.
- More detail means more time means less convenience
- Most respondents lack detailed budget info for their organization
- Compilation problems
- Inconsistent data from multiple users from the same company
- Multiple counting?
- Different areas within same company may not be counted correctly (e.g., telecom business within an electric utility)
- For each project, associate the key indicators, the applications and tools used, and the effectiveness/outcome of the project (ROI, metrics trending up or down)
- What's the value proposition for both past projects and for current or future work
- When responding to the survey, could not tell between annual budget or total budget spent to date (question needs clarification)
- Add total budget
- Add total project cost
- Does not account for in-house cost versus cost of contractual services (needs to differentiate between the two expenses)
- Need to define funding sources (some cost may not be included in organization's budget)

- Break data cost up into individual technologies
- Field data collection
- Data conversion cost should be broken into smaller categories (paper to digital, CAD to GIS, GIS version I to GIS version II)
- Software/hardware
- Granularity by application (devices for field, software for CAD, software for Web)
- Software and how it is used in the business (integrated into applications, or stand alone application processes – should include the business processes they support)
- A ratio of services to hardware to software (compare all three)

Are data types current? What about the data sources?

- Add areas for GPS, field survey, governmental land base sources, who enters data, who owns data, and the organizational structure and processes for entry/maintenance.
- Data conversion issues of old have been replaced with different data-related issues:
 - Data maintenance
 - Data quality
 - Data integration
- Data conversion is a lesser issue today and could be a subset of a larger data issue
- Consider a new category called Data Integrity, which would include some of the above and/or data ownership and retention
- Could have a second tier of data questions that are optional for participants; or perhaps an additional targeted survey distributed at another time
- Why include all the cost information – it shows nothing unless you have a picture of the entire organization
- Multiple data sources are not coherent
- Different coordinate systems
- Time lag between survey/platting and commercial availability of the landbase – need to be doing a lot of the construction and installation work during this period, so this time is critical
- Not really, include LIDAR pictography, LBS, ortho, photography (stereo), photogrammetric
- Not spatially accurate
- No accuracy standards
- Under the Landbase Sophistication part of the survey add the following information:
 - LIDAR
 - Digital Terrain Modeling
 - Other types of 3-D modeling
- Under General Info part of the survey add:
 - How many parcels do you work with or have?

- Under the Landbase Sophistication part of the survey add the following info under the Intelligent vector data
 - Public works to the types of GIS users
 - Addresses linked to parcels and or buildings
 - Regional Government/District government
 - State Government/ Province
- Under the Enterprise systems part of the survey add:
 - Integration between utilities and landbase
 - Shareable with other enterprise systems

Other Questions?

- Architecture
 - Hardware - servers
 - Operating systems
 - Memory
 - Disc space
 - Processor
 - Field Devices
 - Operating systems
 - Configuration
 - PDA-tablet-PC
 - Ruggedized - non-ruggedized
 - Wireless
 - Terminal servers
 - Standards
 - Data exchange
 - Interfaces
 - Symbology
 - Data warehouse/data marts
- Outsourcing
 - IS
 - Planning/design
 - GIS records maintenance
 - Applications
- Business drivers
 - Cost
 - Deregulation
 - Legislative issues
 - Accuracy - accounting and accountability
 - Accuracy - operations
 - Efficiency
 - Data Access
 - Asset management
 - Reliability
 - Customer service
- GIS as it relates to records management—Do you have a records management system? Is it linked to GIS?
- What are your practices/policies concerning data sharing?

- See section about – need to address Data Integrity (quality, completeness, etc.)
- Data ownership—Who in your organization has the documented/undocumented accountability for the GIS data?
- Add “Data Type” column to “software” question (data type might be “land data”)
- Under the Geospatial System Information add a part for the following database software:
 - Oracle
 - SDE
 - SQL Server
 - Access
 - Cybase
- We need to re-consider the dollar questions unless we decide to put a company profile section in to give it more meaning.
- Need to ask the users these questions:
 - What do they think is the next emerging technology?
 - How would they use it?
 - If research dollars are spent, what should they be spent on? e.g. 20 years ago the fax was a leading technology. It solved some remote communication problems.
 - If you could fix one thing related to GIS, what would it be?
- Is everyone using the same sources?
 - Within one business
 - Across multiple business or entities (businesses, utilities, municipalities, counties, states...)
- Coordination between telecoms and municipalities
- Paper to digital mapping
- Common standards and processes, especially problematic as more work is outsourced to contractor engineering and other groups
- What is the driver for the project/work?
 - Cost containment
 - Operations improvement
 - Staff reduction
 - Improving customer service
 - Improving performance against key metrics/indicators
 - Revenue stimulation
 - Government mandate
 - Regulatory issues
 - Sarbanes-Oxley accounting and reporting
 - IT requirements
- Who paid for the project/work?
 - IT
 - Engineering
 - Operations

- Who realized the ROI/benefit for the project/work?
 - IT
 - Engineering
 - Operations
- Who audited the project/work to determine whether/how the benefits were realized? Degree to which the ROI or key indicator was affected?
- Recent projects completed? Trending?
- Business case development. What timeframes are involved within the user business? (e.g., when can/should the vendors get involved?)
- What are the challenges/pain points?
- Do the projects map to a strategic plan? (this would be very high value to user businesses)
 - To a corporate wide plan?
 - To a departmental plan?
 - Are they tactical or short-term (knee-jerk?)
 - Does your business/entity HAVE a strategic plan? Departmental plan?
- Does your operational plan span your business sectors?
 - Marketing
 - Engineering
 - Operations/dispatch/surveillance/assurance
 - Planning
 - Provisioning
 - Accounting
 - Sales
- Does your business/entity follow standards? e.g., TMF's eTOM
- Driven by workplace practices, not technology
- Interoperability, not just software working together, but workflow management
- Change management (executive/political/silos) for acceptance of new practices and processes

RAPID RESPONSE REPORT

In a continuing effort to fulfill GITA's mission of being the premier resource for information and education on anything and everything Geospatial, GITA will establish a panel of industry professionals who can give voice to industry concerns/issues regarding a variety of topics, from legislation, regulation, CIP/homeland security and more. The objective will be to establish a communication network to provide 72-hour turnaround on requests for information, opinions, industry specific concerns and perspectives.

The initial proposal was to act as a rapid response group in a reactive mode, and the plan to establish the appropriate infrastructure will certainly be modeled that way. However, there was considerable interest in quickly growing this group beyond reactive mode to include a proactive monitoring body that can monitor legislative and regulatory issues as they develop, and provide input into those processes in a proactive mode.

ORGANIZATION

- GITA will provide a designated staff member to coordinate communication
- This staff person will begin by soliciting participants from ITAG advisory membership
- All participants should be willing to commit to providing feedback to GITA coordinator within 48 hours, so they can in turn compile that feedback into a response to the requestor within the following 24 hours, enabling a 72 hour turnaround
- Issues with more complicated issues and broader impacts can be extended beyond the 72 hour goal
- Requests for information/opinions/perspectives and identification of associated issues will be forwarded to the GITA Staff person from internal or external requestors
- These requests can come from external entities, or internally from GITA membership
- The responses will initially be solicited from ITAG advisors according to the existing six industries
- GITA staff person will act as filter, determining:
 - Is this an issue we can address
 - Which vertical industry segments are affected and should be consulted
- While the initial proposal was to have the industry coordinators pull together responses, many in attendance felt that was an unnecessary step, and might make prospective coordinators less likely since they would be signing up for additional responsibilities

- The GITA staff person could perhaps consult with a coordinator when in doubt about the interest/impact of the particular question to a specific industry vertical
- The email would be distributed directly to ITAG industry advisors who have signed up to participate, and committed to 48 hour turnaround
- The GITA staff person will then draft a response – do we need a review panel? BOD??
- There was an idea that the responders would come together in a conference call or webcast mode to review the response and establish consensus on the response
- Brief discussion followed on a few trial run ideas
 - Geospatial One Stop – Milo Robinson from FGDC provided a brief overview, and the goal I think was to solicit ways that utilities can participate and contribute to the NSDI
 - Closely related was the development of a model agreement for data sharing. On this point, Brad Lawrence clearly pointed out how his group in Canada had completed this effort, and were already operating successfully. Many felt that perhaps the first step would be to review that agreement as a starting point for a US agreement.
 - An additional idea was to have the six verticals provide feedback on the current GTR survey questionnaires – before I weigh in on this, I'll have to review what the coordinators notes from the ITAG meeting contain in terms of modifications discussed during our session – we probably have plenty of input from there.

ELECTRIC BREAKOUT

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TOP APPLICATIONS LIST

A:

- Trouble Call/Outage Analysis
- Mobile Work Force Automation
- Engineering Work Order Design
- Work Management
- CIS Integration
- Mobile GIS Computing

B:

- Executive Info./Support System/Access
- Distribution Automation Interface
- SCADA Interface
- Data Migration
- Enterprise Asset Management
- Long Term Planning Management (Load Forecasting, Marketing)
- Reliability Center Maintenance (RCM)
- Engineering Analysis

C:

- Conversion/Data Capture
- Homeland Security
- Land Management
- Vegetation Management
- Transmission
- Joint Use

TOP TECHNOLOGIES LIST

A.

- Internet/Intranet
- Pen Computing/Mobile Computing/Field Device
- Disconnected/Connected Data Access
- Web Services
- EAI
- Tablet
- Wireless

B.

- Data Storage
- GIS Software Choices
- GPS
- Nonproprietary Programming (XML)
- Windows/Windows NT

C.

- OO Software Development Tools
- Digital Orthophotography
- Document Management
- Blue Tooth

CRITICAL ELECTRIC INDUSTRY ISSUES

GITA can assist with training sessions, and lessons learned sessions. Information from forums such as GEOXchange could be maintained in a historical archive available to members.

- 1) Upgrading Software Versions
 - Costs-benchmarks
 - Customization
 - External drivers
 1. Operating system
 2. Database
 3. Hardware
 - Vender support for older systems
- 2) Enterprise integration - mergers/acquisitions
- 3) Process improvement
 - Data accuracy
 - Up-to-date
 - Change management
- 4) Strategic Planning
- 5) Staffing/Resource Management
 - Outsourcing
 - Aging Workforce
 - Organization turnover

GAS BREAKOUT

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TOP APPLICATIONS LIST

- 1) CIS Integration with GIS/AM/FM
- 2) Work Management/Process Automation
- 3) Facility Maintenance—Monitoring and Management
- 4) Mobile Data Collection/Viewing/Access
- 5) Leak Detection/Management
- 6) Gas Outage Management System
- 7) Cathodic Protection
- 8) Asset Management/Plant Maintenance
- 9) Replacement Maintenance Monitoring/Management
- 10) Risk Management
- 11) Damage Prevention
- 12) Dispatching

TOP TECHNOLOGIES LIST

- 1) Pen/Mobile Computing
- 2) Internet/Intranet
- 3) GPS
- 4) Wireless Access
- 5) Data Exchange/OGIS
- 6) Digital Orthophotography
- 7) Document Management/Workflow
- 8) Satellite Imagery
- 9) Spatial Data in Standard RDBMS
- 10) Information security
- 11) Wireless communication (including cell phones, PDA's, etc)
- 12) LIDAR
- 13) Platform upgrades

CRITICAL GAS INDUSTRY ISSUES

- Corporate Vision/Strategic Plan
- Regulatory Compliance (including pipeline integrity support for LDC's)
- Data Integrity
- Damage Prevention
- Enterprise Integration
- Data Sharing Sensitivity (including homeland security)
- Records Management (digital vs. hard copy)
- Competition for Internal Money

LOCAL GOVERNMENT AND PUBLIC WORKS BREAKOUT

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TOP APPLICATIONS LIST

- 1) Emergency Management
- 2) Economic development
- 3) Public Safety
- 4) One Call Center
- 5) Community Planning
- 6) Right of Way Management
- 7) Parcel development and management
- 8) e-government
- 9) Permitting
- 10) Code Enforcement
- 11) Asset Management

TOP TECHNOLOGIES LIST

- 1) Web
- 2) GIS
- 3) Mobile Computing
- 4) GPS
- 5) Wireless Solutions
- 6) Systems Integration (Inter-Enterprise Integration)
- 7) Intelligent Transportation Systems
- 8) SCADA
- 9) IT Architecture
- 10) Data warehousing
- 11) Document Management

CRITICAL LOCAL GOVERNMENT AND PUBLIC WORKS INDUSTRY ISSUES

- 1) Infrastructure Management
- 2) Information Sharing policies
 - In local government
 - Outside local government
- 3) Legal & Financial Accountability
 - GASB 34
 - Asset Management
 - Risk Management
 - Capital Investment programs
- 4) ROI Analysis
 - What is it?
 - Political support needed?
 - Improved services
- 5) GITA should do the following for the above issues
 - Find and publish Best Practices
 - Drive National Leadership
 1. Policies
 2. Standards
 3. Practices
 - Inform the membership of the standards and policies that are in place through
 1. Workshops
 2. Webcasts
 3. Papers
 - Create a committee that meets on standards

PIPELINE BREAKOUT

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TOP APPLICATIONS LIST

- 1) Integration of Facility/ Operational/Maintenance Data
- 2) Risk Management
- 3) Regulatory Compliance—Integrity Management Regulations
- 4) Field Operations/Reporting
- 5) Work Process Management
- 6) Planned Outage Management
- 7) Environmental Management
- 8) SCADA
- 9) Engineering Design
- 10) Land Management

TOP TECHNOLOGIES LIST

- 1) Integration Software
- 2) Internet/Intranet
- 3) Field Computing/Field Data Collection
- 4) Open GIS--ISAT/PODS
- 5) Data Security
- 6) Data maintenance Tools
- 7) Survey Data Capture
- 8) CIS, ILI, and SOILS Data Integration
- 9) Electronic Document Management
- 10) Change Detection

- 11) Data sharing between users
- 12) Data sharing between applications

CRITICAL PIPELINE INDUSTRY ISSUES

- Threat Assessment – For integrity management
- Acquisition Data - from purchasing a new company
- Public Awareness – API 1162 New Regulations
- Reporting – DOT Reporting, FERC Reporting, SEC Reporting, Tax Reporting

TELECOMMUNICATIONS BREAKOUT

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TOP APPLICATIONS LIST

- 1) Engineering Analysis/Network Analysis
- 2) Facility Model Analysis and Planning
- 3) Work Management
- 4) Accounting/Financial System Interface
- 5) Marketing/Business Geographics
- 6) Engineering Work Order Design
- 7) Legal and Regulatory Support Applications
- 8) CIS & ERP Integration with AM/FM/GIS
- 9) Spatial Asset Management (web display) Network Inventory to mean all
- 10) Customer Care
- 11) Outage Management

TOP TECHNOLOGIES LIST

- 1) Data Storage/Data Warehouse
- 2) Internet/Intranet
- 3) Data Exchange/OGIS
- 4) Pen & Mobile Computing/Data Capture
- 5) Document Management/Work Flow
- 6) Nonproprietary Programming/Source OLE-COM
- 7) Wireless (802.11G; LIDAR)
- 8) GPS
- 9) OO Software Development Tools
- 10) BB Comm/Fiber, Microwave
- 11) Spatially Integrated Corporate Model

CRITICAL PIPELINE INDUSTRY ISSUES

- 1) Data quality?
 - Incorrect
 - Inconsistent
 - Incomplete
 - Redundant
 - Varying scales and quality
 - Distinction between physical network and data systems that represent that network, especially with number of touches to network over time (typically >60K dispatches per day in a tier 1 provider company)
- 2) Network modeling and semantics across systems
- 3) Multiple systems
- 4) Managing paper records and inventory data – conversion and maintenance
- 5) Systems silos
- 6) Legacy systems and legacy assumptions that limit the utility of the systems and information
 - Closed world assumption is rampant (if the system doesn't know about it, it doesn't exist)
- 7) Accessibility to data – who, where, when?
- 8) Synchronization between groups, especially problematic with growing reliance on outsourced groups
 - Lack of face-to-face communication with increased outsourcing, remote groups, proliferation of teams working on similar issues
 - E.g., one group takes a pole out of service while another group is attaching a new cable to it

- 9) Mix of applications
 - Technology changes require new applications to be developed
 - E.g., PON, long-loop DSL
- 10) Market changes
 - Line losses
 - Product commoditization leads to lower prices, which in turn drives lower margins
- 11) Wholesale/retail implications
 - Systems
 - Networks
 - Information exchanges
- 12) VOIP
 - New technology that breaks everything! (Systems, networks, assumptions, business models, network models – e.g., concept of circuits)
 - QoS & SLAs
 - Huge demand will drive rapid change
 - OSS deficiencies
 - E911 location services
 - Is location meaningful anymore? location on the earth's geography and/or location on the network topology
 - Design
 - Existing plant and investment – must reuse to leverage historical investment base → new life for old plant
- 13) Documentation attrition – shrinking knowledge base in the systems and in the network
 - Meta-data is problematic (hard to document, easy to lose)

WATER/WASTEWATER BREAKOUT

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TOP APPLICATIONS LIST

- | | |
|---|--|
| <ul style="list-style-type: none"> 1) Workflow Applications 2) Document Management 3) Security 4) cMOM Compliance 5) Regulatory Reporting 6) Asset Management 7) Facility Management 8) Management Information Systems 9) Leak Detection 10) GIS Migration/Integration 11) AM/FM GIS Migration 12) Field Computing 13) Modeling 14) System Integration 15) CMS | <ul style="list-style-type: none"> 16) CIS/CRM 17) Outage management 18) Engineering Design 19) Planning and resource management 20) ERP 21) EAI 22) Messaging 23) Work Management 24) SCADA 25) Security/Incident Management System (IMS) 26) LBS 27) Routing 28) Dispatching 29) AVL |
|---|--|

TOP TECHNOLOGIES LIST

- 1) GPS
- 2) GIS Software
- 3) Mobile computing
- 4) Redlining
- 5) Field data capture
- 6) Data exchange OGIS
- 7) Physical Database
- 8) Database Management
- 9) WiFi/Wireless technologies
- 10) Application integration
- 11) Workflow integration
- 12) Document management
- 13) Orthophotography
- 14) Imagery
- 15) LIDAR
- 16) Web Services
- 17) Thin Client/Portal
- 18) Non-proprietary source OLE/COM

CRITICAL WATER/WASTEWATER INDUSTRY ISSUES

- 1) Compliance
- 2) Regulation
- 3) Budget
- 4) Integration
- 5) Complacency
- 6) Change Management
- 7) Project Management
- 8) Security
- 9) Aging Infrastructure
- 10) Compare Issues from Australia GTR for commonalities
- 11) Have copy of report (GTR) for advisors to become familiar with
- 12) Define objectives of report and how it is used
- 13) Too much detail may deter response
- 14) Bring together a joint conference with AWWA/APWA/CNCIS and Surveying community (include URISA)
- 15) IMTech looking to expand (could be included with GITA)