

**AN EXECUTIVE SUMMARY OF THE PHASE ONE REPORT
OF THE PROJECT**

**“DEFINING AND COMMUNICATING
GEOSPATIAL INDUSTRY WORKFORCE DEMAND”**

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DEFINING AND COMMUNICATING GEOSPATIAL INDUSTRY WORKFORCE DEMAND

EXECUTIVE SUMMARY

The President's High Growth Job Training Initiative is a strategic effort to prepare workers to take advantage of new job opportunities in high growth, high demand and economically vital sectors of the economy. The program is sponsored by the U.S. Department of Labor's Employment & Training Administration (DOL-ETA). Fourteen targeted industries have been selected and three, including Geospatial Technology, have been identified as important emerging high growth industries. According to Jennifer McNelly, Director of DOL-ETA's Business Relations Group, geospatial was targeted due to the nation's reaction to 9/11 and the need to develop national disaster response capabilities, with community planning based on geospatial skills.

The objectives of this project are:

1. To define the diverse geospatial industry components, characteristics, and skills required to fill geospatial occupations, so that schools and One-stops can understand them and provide the necessary training;
2. To develop an effective and compelling public outreach program for distribution through existing DOL-supported education and information channels, to address the lack of public awareness of geospatial technologies and their applications, and to make a better connection between the geospatial industry and populations of potential workers;
3. To pilot and demonstrate an innovative tool correlating current location-based industry demand with educational and workforce opportunities;
4. To pilot and demonstrate a specific application of these new outreach materials and information tools to better align educational, employment, and economic development programs with employers' labor needs.

This report describes the project's Phase I efforts to collect information and build consensus among stakeholders and industry leaders regarding the trends of the geospatial industry and its workforce demand. The specific objectives are:

1. To summarize the results of the two thought-leader roundtables held in Washington, D.C. on October 6th 2005 and January 27th 2006;
2. To summarize responses to an online feedback mechanism, which collected responses during the months between the two roundtables;
3. To present information about industry definition, market segmentation, workforce demand, and challenges in meeting the demands;
4. To seek feedback from a large group of stakeholders regarding the critical issues broadly defined above.

DEFINING THE GEOSPATIAL TECHNOLOGY INDUSTRY

Based on an analysis of existing industry definitions, comments obtained from the online feedback mechanism, and discussions at the two round table events, the following industry definition is recommended for adoption by DOL.

Recommended Definition: The geospatial industry acquires, integrates, manages, analyzes, maps, distributes, and uses geographic, temporal and spatial information and knowledge. The industry includes basic and applied research, technology development, education, and applications to address the planning, decision-making, and operational needs of people and organizations of all types.

GEOSPATIAL MARKET SEGMENTATION

Defining the market is difficult given the current lack of record-keeping. There are many ways to segment the geospatial industry. It is critical to determine what would work best for collecting data about geospatial workforce demand.

Recommendations: Use a matrix, segmenting first by technology skills and second by industry type. This approach to segmentation will provide the greatest flexibility for inclusion of geospatial skills in diverse professions and will accommodate new job functionality and skills as the technology develops.

GEOSPATIAL TECHNOLOGY INDUSTRY WORKFORCE NEEDS

To assess U.S. workforce needs, we must equip ourselves with a better system for collecting data about geospatial workforce needs.

Recommendations: DOL should consider adding new Standard Occupation Classification codes to reflect the emergence of geospatial professionals. GIS/Geospatial Analyst and GIS/Geospatial Technician should be assigned priority for addition as new SOCs. GIS/Geospatial Manager and GIS/Geospatial Application Developer should receive future consideration or be added as new geospatial categories to existing technical management and software development SOCs.

It is challenging to project geospatial workforce needs at the national level. GITA is developing methodology for its Denver pilot project to determine industry workforce demand at the level of a metropolitan area. AAG provides an analysis based on DOL BLS projections of job growth by occupations from 2002 to 2012.

Recommendations: We recommend a combination of top-down and bottom-up quantification methods. Bottom-up methodology would involve surveying of industry in a metro area to determine geospatial workforce demand. The top-down approach would determine demand within broad occupational categories, assuming a linear relationship between growth in the overall profession and growth in its geospatial portion.

GEOSPATIAL SKILLS AND COMPETENCIES

The most comprehensive work on geospatial workforce competencies to date has been conducted by the University of Southern Mississippi. Cyndi Gaudet and colleagues identified 12 roles and 39 competencies within the geospatial workforce. Using the online feedback mechanism, we asked participants to identify the roles where there will be a shortage of workers in the next 10 years. We also asked if the 13 Gaudet technical competencies adequately describe the competencies in respondents' organizations.

Recommendations: The University of Southern Mississippi's Geospatial Workforce Competency Model should be refined and updated. It would be helpful to clarify the differences between the terms "roles," "competencies," "occupations," and "job titles." A fifth group of competencies may be added to include discipline-specific application competencies such as "environmental applications," "geological applications," "demographic applications," or "sociological applications." "Standards" and "interoperability" may be added to the existing technical competencies. Level of competency is also important.

MEETING GEOSPATIAL WORKFORCE NEEDS

We asked respondents to identify the academic disciplines that are critical in providing education for the future geospatial workforce. The two most often identified disciplines were computer science and geography. Four-year university/bachelor's degree, on-the-job training, vendor-specific training, apprenticeship and master's degree were identified as important education and training mechanisms.

The concluding session of the January roundtable provided a group discussion of gaps between future competency needs and current training and education, including the following concepts:

- GIS education needs to become much more prevalent in all levels and links between related areas of study to geospatial applications need to be strengthened. The percentage of students enrolled in GIS programs needs to be significantly increased through aggressive outreach campaigns and by building awareness of the geospatial industry in general.
- Geographical sciences and geospatial technologies must be embedded in core curricula of K-12 and K-16.

- The National Research Council's publication Learning to Think Spatially: GIS as a Support System in the K-12 Curriculum should be used to better integrate geospatial thinking into existing courses.
- In addition to the NRC report, efforts by professional associations should be leveraged to help build a comprehensive educational strategy to help meet the current and future geospatial workforce demand.
- Employers and educators must work together to develop effective strategies to close the gap between geospatial workforce demand and supply. The geospatial industry must articulate its workforce needs to ensure that educators respond with curricula that result in appropriately educated and trained individuals.
- Two year (community-based) colleges should assume a strong role in training new geospatial technologists and meeting on-the-job training needs of local professionals.
- There is a need for training in spatial analysis within the domains of social, behavioral and economic sciences, statistics and quantitative analysis.

GITA and AAG would like to acknowledge the many geospatial industry professionals who have provided comments and suggestions on the project's Phase 1 report. Additional comments are welcomed and will be synthesized into a final version of the report and submitted to the Department of Labor Employment Training Administration in the near future.

Please visit <http://www.aag.org/giwis/> and follow the links to provide your comments.