DOT: GIS All Roads Base-Map Project

Overview: The Department of Transportation (DOT), State Safety Office had a need for services to provide Information Technology (IT) resources meeting the specific following requirements for Knowledge, Skills, and Abilities for the GIS All Roads BaseMap Project:

- Knowledge of the principles, practices and techniques of system development and maintenance life cycles.
- Knowledge of Geographic Information Systems principles, design and practices.
- Knowledge of Object Oriented Programming principles, design and practices.
- Knowledge of FDOT Linear Referencing Systems.
- Knowledge of FDOT Spatial datasets and Roadway Characteristics Inventory (RCI)
- Skill in developing project plan/schedule and accurately estimating time requirements for project tasks.
- Skill in customer service.
- Skill in coding, thoroughly testing, and debugging complex applications using web based and object oriented programming languages, using Oracle, Oracle Spatial and/or DB2 databases.
- Skill in coding with the ESRI suite of GIS Products including ArcIMS, ArcObjects, and ArcSDE
- Skill in coding with Visual Studio .NET, VB.NET, and ASP.NET
- Skill in interpreting and communicating technical information related to computer programming and data processing, both verbally and in writing.
- Ability to develop and manage information systems documentation in accordance with the Department's standards.
- Ability to develop detailed user instructions and documentation.
- Ability to plan, organize, coordinate, and prioritize work assignments for him/herself or lower level programmers/analysts.
- Ability to evaluate and resolve computer application and system problems.
- Ability to work effectively with users to identify and document requirements for the maintenance or development of computer systems.
- Ability to analyze processes and workflows to design efficient information solutions.
- Ability to prepare complex computer program specifications.
- Ability to prepare computer program test plans and to create test databases and test environments.

Before 2009, the Turnpike Office of FDOT purchased the TeleAtlas Street Network, version 4, as the base for its Turnpike State Model. They had invested considerable time and effort to tag the TeleAtlas Street Network segments that corresponded to the State Highway System (SHS) with an FDOT Roadway Id. GIS routines were developed to automate this migration of Roadway Ids from the FDOT Planning Base Map to TeleAtlas Street Segments. When the FDOT Safety Office began this project, Turnpike agreed to share this dataset with Safety Office. The first task was to migrate the information from Turnpike's copy of the version 4 TeleAtlas Street Network to version 8.3 of the TeleAtlas Street Network. GIS routines were developed to

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automate this process, and GIS tools were created to assist in the editing of segments that required a manual manipulation.

Once the FDOT roadway Ids belonging to the SHS had been placed on the TeleAtlas Street Network, version 8.3, the Safety Office began expanding the network to include the Roadway Ids belonging to the Highway Performance Monitoring System (HPMS) sample roads. Turnpike had already developed GIS routines to conflated Roadway Ids from the FDOT Planning Base Map to the TeleAtlas Street Network. These routine were adapted to automate the conflation of roadway Ids belonging to the HPMS sample from the FDOT Planning Base map to the TeleAtlas Street Network. After these routines were completed, a substantial amount of hand editing remained, and the GIS editing tools mentioned above were used to complete this task. At this point, roadway Ids that were in the FDOT Planning Base map were also in the All Roads Base map. This constituted what will be referred to as the "**primary**" routes.

Since the Safety Office had been given the task to generate crash analysis for **off system roads** (defined here as "**secondary**"), the Safety Office began the process to tag all remaining segments in the TeleAtlas Street Network with a FDOT Roadway Id. FDOT has not assigned a roadway Id to these roads.

In 2009, there was a FDOT roadway Id on every segment in the TeleAtlas Street Network, version 8.3. There are over 450,000 roadway Ids for the 2 million segments in the network.

In 2010, the FDOT purchased the NavTeq Street Network. In the Fiscal year 2009-2010, new routine and procedures were implemented to migrate the FDOT route information in the TeleAtlas Street Network to the NavTeq Street Network.

Enterprise 24x7 Inc provides IT consulting services to assist DOT with the support of programs, processes and other activities implemented for the purpose of developing, deploying and maintaining the GIS All Roads Base Map Project.

Description of Services: The Executive, Applications Development coordinates systems analysis and applications development activities through direct and indirect staff. Directs development teams in the areas of scheduling, technical direction, future planning and standard development practices. Participates in quality improvement activities for the development organization. Meets scheduled milestones to ensure project/ program objectives are met in a timely manner and has an in-depth knowledge of the principles, theories, practices and techniques for managing the activities related to planning, managing and implementing systems analysis and applications development projects and programs. Safety Office has been tasked to transfer FDOT information onto a commercially available digital street network, and this individual oversees that process. This process will involve assembling FDOT-maintained, tabular and spatial data and providing instructions to Safety staff for the transfer of information to the digital street network. This individual is responsible for creating a documented procedure for the transfer, and will create quality assurance procedures to insure the transfer was done correctly. This individual trains Safety staff in the use of tools that have been developed for this purpose, and throughout this process, run the quality assurance procedures. When Safety personnel have completed their portion of the task, this individual processes the data so that a linear referencing system is created using the digital street network.

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The Web Applications Programmer, GIS Component Architect develops, maintains, and supports applications for the organization's Internet/Intranet sites and GIS application. Gathers and analyzes requirements. Programs all or selected components of web applications. Documents components and applications. Develops automation techniques to enable end-user content publishing; programs, tests and implements mapped graphic images, forms, web pages and GIS application; handles client browser support inquiries; maintains links to external sites and accuracy on internal links while ensuring up-to-date information. Researches, evaluates and recommends new Internet and GIS tools and applications for use in assigned responsibilities. This individual will be actively involved in the transfer of information to the digital street network along with Safety staff. This individual will assist in training Safety staff, and overseeing the day to day work of Safety Office staff.. This individual will provide answers to questions Safety Office staff will have when transferring information to the digital street network.

The Project Manager is responsible for overall coordination, status reporting and stability of complex and cross-functional project oriented work efforts. Manages multiple projects simultaneously. Establishes and implements project management processes and methodologies for the IT community to ensure projects are delivered on time, within budget, adhere to high quality standards and meet customer expectations. Responsible for tracking key project milestones and adjusting project plans and/or resources to meet the needs of customers. Partners with senior management of the business community to identify and prioritize opportunities for utilizing IT to achieve the goals of the enterprise. Possess extensive knowledge and expertise in the use of Project Management methodologies and tools and understand human resources policies and practices and change management techniques. Liaison between the Technical team, the client and the company. This individual will create Statement of Work and Project Plan for the project, define project deliverables, identify project risks, review monthly billings versus worked hours, will verify time-sheet versus assigned tasks, create and update spread-sheet with billings to date, remaining amount, and remaining hours. This individual will ensure the project is run in budget, and will communicate with the client and the team in case of delays, risks and issues as quickly as possible.

Technology/Environment:

- ArcIMS
- Oracle Database
- .NET
- Ms-Access
- ArcObjects
- DB2
- Java
- VB
- ArcSDE
- SQL/PLSQL
- J2EE
- C#

Company Services Provided:

- Application Development Executive
- Web Applications Programmer
- Project Manager

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