

# Florida Department of Transportation

## State Safety Office (SSO): GIS Quality Assurance & Control

### Enterprise 24x7 Inc. Project Summary

#### Overview

The Department of Transportation (DOT), State Safety Office had a need for services to provide a Quality Assurance Manager to analyze, verify and improve the GIS Editing process actively performed by a team of about ten GIS Editors in order to capture and measure the performance of each active GIS task as currently performed. The Quality Assurance Manager was tasked to measure, quantify and improve the Quality of the GIS Editing process as a result of the monitoring and process review. Annually, the Team of GIS Editors edits the entire roadway system of Florida, made of hundreds of thousands of roadways, millions of segments and intersections.

The Quality Assurance (QA) portion of this project involved the definition, evolution and execution the following tasks:

- QA Committee with Roles and Responsibilities
- QA&QC Targets and definitions
- QA Escalation Procedures to assign and resolve issues
- Weighted Project Risk Analysis Matrix
- Definition of Standards which include a well-defined and continually updated a Technical GIS-Editor All-Roads QA Handbook for the GIS-Editor describing all the series of GIS Procedures and QA/QC Business Rules which must be adopted and followed by all the GIS Editors during their daily operations. This book of knowledge to be successful must:
  - Provide answers to the Editors they have during their daily processes
  - Allow the Safety Office Manager to review each aspect of the process and discuss possible modifications (if/when needed).
  - Provide sufficient documentation to allow the Safety Office Manager the possibility to replace GIS personnel, as needed, with minimal impact to the overall team progress.
  - Provide sufficient documentation to allow a new GIS Editor to start processing with a minimum training time and sufficient knowledge transfer.

The Quality Control (QC) portion of this project involved the definition, evolution the following tasks:

- Determine a series of QC Measures to project the "Target Process Tolerance" and the "Current Process Tolerance" for each different GIS Process applied by the team during the Annual Editing Process. To be successful, the trend of the chosen Quality measures overtime needed to allow the Safety Office to:
  - Ensure sure each process reached and remained in a status of "Quality Control" (as defined in the QA Handbook), when no changes to the "controllable input factors" were applied to the system.
  - Identify the overall Status of each Process over time, and confirm changes (including personnel turn-over, changes of policies and procedures, changes of Base Map NavTeq/TeleAtlas, etc.) resulted in a Quality improvement or at a minimum did not cause the quality to fall below the previous Quality threshold.
  - Compare sub-set of Products produced using the same Editing Process to identify possible Quality issues or improvements by County.

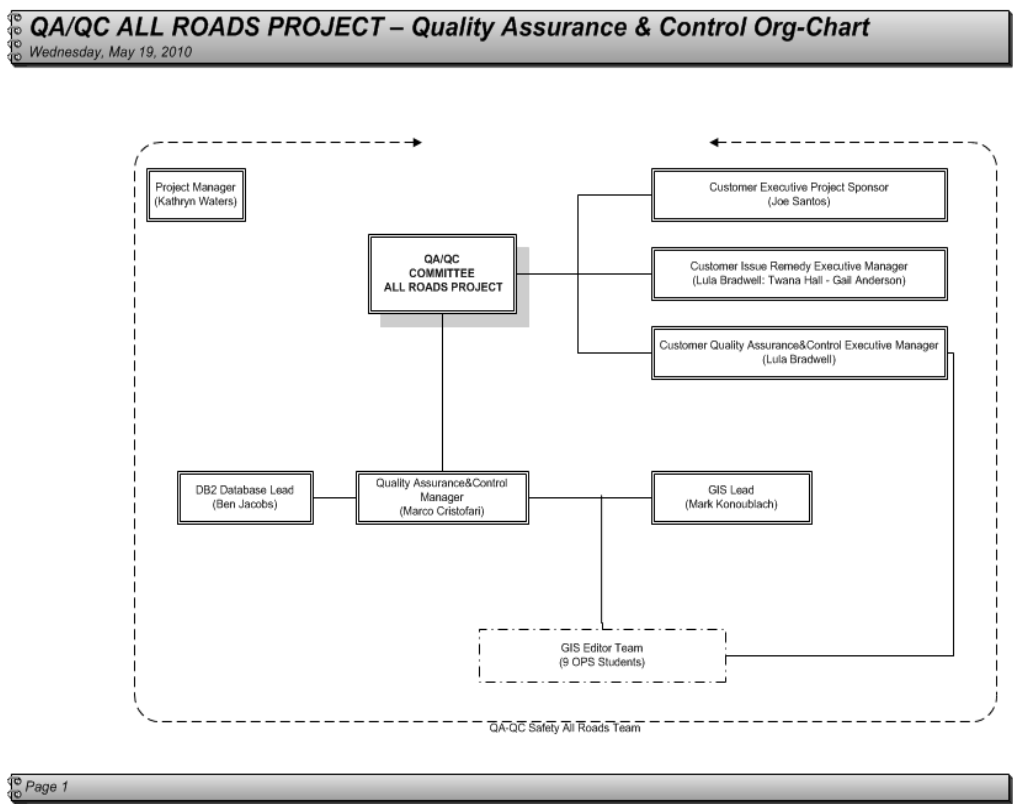
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- Compare sub-set of Products produced using the same Editing Process to identify possible Quality issues or improvements by Editor.
- Determine a series of QC Procedures in order to verify, control and improve the Status of the Process through the Quality Measures over time. Since the Information Technology Nature of the GIS Editing Processes applied to the Base Map Project, those procedures were based on QC methodologies and Statistics, Mathematical, Relational Database and GIS methods, techniques and tools.

The QC function (with the support of the GIS Supervisor for the GIS related tasks) was responsible to create and execute the QC Procedures approved by the QA Committee and present findings and results to the QA Committee for the overall evaluation of the Processes, including status, improvements, etc.



### E24X7INC Services

The **Quality Engineering Analyst (QEA)** was responsible for establishing and implementing quality assurance and compliance processes for the FDOT-SSO organization. The QEA worked closely with IT leaders to develop and implement an overall quality maturity roadmap and plan for each IT functional area. The QEA worked with development, testing and production teams to develop, publish and implement software quality assurance plans. The QEA reviewed progress against the plan regularly with IT leaders, technical teams and customers to make modifications as required. The QEA established internal IT service quality control standards, policies and

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procedures. The QEA monitored, evaluated, managed and executed audit processes to ensure compliance. The QEA coordinated and facilitated quality assurance activities across projects with project managers and project sponsors. The QEA provided guidance and subject matter expertise to IT teams on QA methodologies and processes and educated them on their responsibilities/accountabilities for the purpose of achieving on-time and quality deliverables. The QEA made recommendations and directed improvements to the software development lifecycle process. The QEA documented non-compliance to policies, process and standards and assisted in their resolution. The QEA analyzed and identified trends in IT performance metrics. The QEA designed, monitored and analyzed performance metrics for quality improvement initiatives. The QEA conducted audits and analyzed findings to develop appropriate corrective action recommendations. The QEA provided training on established processes and policies. Skills and knowledge required for the QEA included systems lifecycle development, project management, quality management and improvement methodologies and standards such as Total Quality Management (TQM), Six Sigma and the Software Engineering Institute's Capability Maturity Model (SEI-CMM). The QEA was a senior IT professional experienced at managing teams, developing and implementing QA\QC procedures. This consultant was familiar with the use of GIS tools in an Oracle environment and map interfaces. The QEA was responsible for overseeing the QC of the Base Map during upgrades to newer versions of NavTeq and during the creation of new nodes. The QEA was responsible for providing guidance and support to the staff data entry team and collecting metrics on the work progress and QC efforts. The QEA was responsible for generating maps and map layers to support the HSIP annual report.

### Technologies Leveraged

- Quality Assurance Standards
- ArcIMS
- Oracle Database
- VB
- Quality Control Standards
- ArcSDE
- DB2
- MS Office
- Business Analysis Techniques
- MS-Access
- SQL/PLSQL