## Department of Transportation (DOT):
## GIS Quality Assurance & Control

**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 while the process is actively performed by a team of about 10 GIS Editors in order to capture and measure the performance of each active GIS task as currently performed. The Quality Assurance Manager is tasked to measure, quantify and improve the Quality of the GIS Editing process. Annually, the Team of 10 GIS Editors edits the entire roadway system of Florida, made of hundred thousands of roadways, millions of segments and intersections.

The QA function is responsible to define (and continually update and execute):
- QA Committee with Roles and Responsibilities
- QA&QC Targets and definition
- 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:
  - o Allow the Editor to find all the answers he/she might have during their daily processes
  - o Allow the Safety Office Manager to review each aspect of the process and discuss about possible modifications (if/when needed).
  - o Allow the Safety Office Manager the possibility to replace GIS personnel, when if needed, without loosing of know-how.
  - o Allow for a new GIS Editor to start processing with a minimum time of training and knowledge transfer.

The QC function is responsible to define (and continually update):
- A series of *QC Measures* to estimate 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 will allow the Safety Office to:
  - o Make sure each process reaches and remains in a status of "*Quality Control*" (as defined in the QA Handbook), if no changes to the "*controllable input factors*" have been applied to the system.
  - o Identify the overall Status of each Process over time, and make sure any changes (including personnel turn-over, changes of policies and procedures, changes of Base Map NavTeq/TeleAtlas, etc.) will result in a Quality improvement or at least in maintaining the previous Quality threshold.

- o Compare sub-set of Products by County produced using the same Editing Process to identify possible Quality issues or improvements.
- o Compare sub-set of Products by Editor produced using the same Editing Process to identify possible Quality issues or improvements.
- A series of QC Procedures in order to verify, control and improve the Status of the Process though the Quality Measures over time. Since the Information Technology Nature of the GIS Editing Processes applied to the BaseMap Project, those procedures will be 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) is 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.
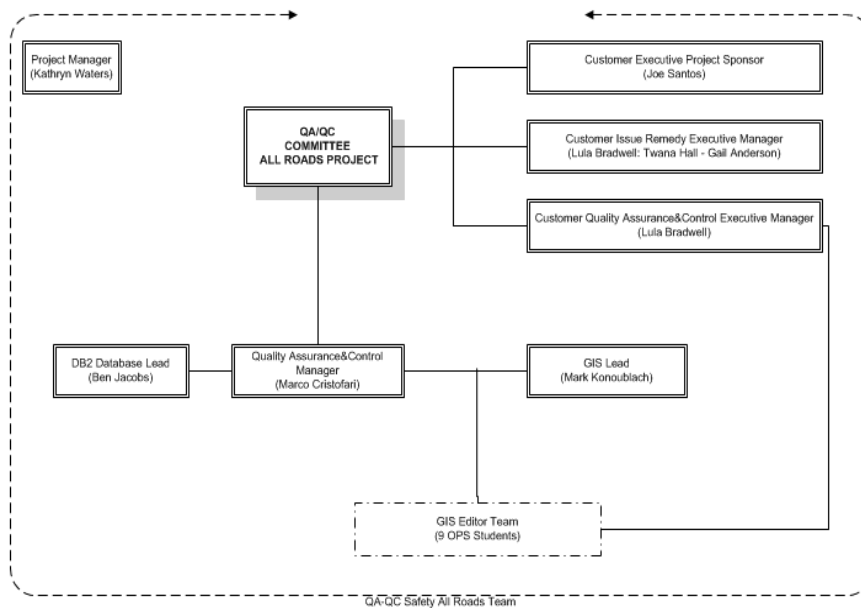


**Description of Services**: The Quality Engineering Consultant is responsible for establishing and implementing quality assurance and compliance processes for the IT organization. Works closely with IT leaders to develop and implement an overall quality maturity roadmap and plan for each IT functional area. Works with development, testing and production teams to develop, publish and implement software quality assurance plans. Reviews progress toward the plan regularly with IT leaders, technical teams and customers to make modifications as necessary. Establishes internal IT service quality control standards, policies and procedures. Monitors, evaluates, manages and executes audit processes to ensure compliance. Coordinates

and facilitates quality assurance activities across projects with project managers. Provides guidance and subject matter expertise to IT teams on QA methodologies and processes, educates them on their responsibilities/accountabilities for the purpose of achieving on-time and quality deliverables. Makes recommendations and directs improvements to the software development lifecycle process. Documents non-compliance to policies, process and standards and assists in their resolution. Analyzes and identifies trends in IT performance metrics. Designs, monitors and analyzes performance metrics program for quality improvement initiatives. Conducts audits and analyzes findings to develop appropriate corrective action recommendations. Provides training on established processes and policies. Needed skills and knowledge include 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—Capability Maturity Model (SEI-CMM). Senior IT professional experienced at managing teams, developing and implementing QA\QC procedures. This individual is familiar with using GIS tools in an Oracle environment and using maps. Responsible for overseeing QC of the Base Map during upgrades to newer versions of NavTeq and during new node placements. Responsible for providing guidance and support to the staff data entry team and collection metrics on the work progress and QC efforts. Responsible for generating maps to support the HSIP annual report.

**Technology/Environment**:

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

**Company Services Provided:**

- Quality Engineering Consultant

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