

Techno-Commercial Proposal
to
State of West Virginia Department of
Administration
to provide
Develop a GIS Database for the Digital
Conversion of Countrywide Tax Maps

July 2012

Version 3.0

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WV PURCHASING
DIVISION

Submitted by

NIIT
technologies

Trust us to find the way

NIIT Technologies Inc.

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1. Cover Letter

Doc Ref: EIC/DOC/USA/WVPTD/07/2012

State Tax Division
Property Tax Division
Greenbrooke Building
1124 Smith Street
Charleston, WV 25301

Sub: Submission of Techno-Commercial Proposal to Develop a GIS Database for the Digital Conversion of Countrywide Tax Maps

NIIT Technologies Inc. is pleased to submit the proposal to develop a GIS database for the digital Conversion of Countrywide Tax Maps for State of West Virginia, Property Tax Division.

With absolute capacity and credentials, we are confident to take up the work. Further, please find this dossier of information as our detailed and qualified response to the RFQ. You will find our company details duly demonstrating our track record and credentials.

We shall be glad to provide any clarification and or additional information where ever prompted during the evaluation process. Onward, we aspire to provide our end-to-end GIS Portfolio to West Virginia Property Tax Division (WVPTD).

I do hereby certify that the all information furnished in the proposal is true, accurate and complete.

Thanking you,

Sincerely,

For NIIT Technologies Inc.

Subash Sivakumaran



Authorized Signatory

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E-mail: subash.sivakumaran@niit-tech.com

2. Executive Summary

West Virginia State Property Tax Division (WVPTD) has intended for a Request for Quotation (RFQ) response for digitization of tax maps in accordance to its standardized guidelines and procedures for Mingo County having approximately 369 tax maps and 25,986 parcels.

Based on the requirements studied in the RFQ NIIT Technologies is pleased to submit the WVPTD and pleased to give its services for the following scope as enlisted below:

1. Rectification of Tax Maps
2. Vectorization
 - a. Attribute Tagging
 - b. IAS Data Linking
 - c. Annotation Symbol Tagging
3. Replication of Original Cartographic Styles, Elements and Arrangement of Tax Maps
4. Publishing of Finished Tax Maps in true GIS Manner
5. Effective, open and communicative process with the county and West Virginia Property Tax Department (WVPTD) throughout all the phases of the project.

Following will be the deliverables for the above scope of work:

1. User Needs Assessment document
2. Data Inventory Document
3. ArcGIS Geodatabase containing a seamless, countywide surface polygon parcel feature class along with attributes and associated IAS data attached to each polygon .
4. Finished tax maps including digital map series established by districts and maps numbers compatible with the most current version of ArcGIS map series functionality.
5. Final map document (MXD) of map grids for county's existing map series.
6. Digital annotation and symbols existing on the county tax maps and digitized road centre line and road buffers.
7. Lot lines, hydrology, land hooks.
8. Configuration of MXD document for auto generation of tax maps into PDF.

3. Technical Approach and Methodology

3.1 Project Definition

3.1.1 Project Background

State of West Virginia Property Tax Division (WVPTD) is soliciting for a GIS database development of county wide tax maps using the latest Esri software for assisting the counties with their tax mapping programs.

3.1.2 Comprehending the Statement of Work

NIIT Technologies understands the statement of work detailed in the RFQ and with its proven track record of delivering the relevant projects to various government, public and private sector in USA, Europe and Middle East and Asia. NIIT hereby proposes the conversion of tax maps to GIS cadastral layer and as per the updated Geodatabase design. Following will be the activities performed within this scope:

1. Rectification of Tax Maps
2. Vectorization
 - Attribute Tagging
 - IAS Data Linking
 - Annotation Symbol Tagging
3. Replication of Original Cartographic Styles, Elements and Arrangement of Tax Maps
4. Publishing of Finished Tax Maps in true GIS Manner
5. Effective, open and communicative process with the county and West Virginia Property Tax Department (WVPTD) throughout all the phases of the project.

3.2 Proposed Approach and Methodology

NIIT Technologies proposes to adopt the following approach to meet the requirements of WVPTD:

i. User Need Analysis

NIIT Technologies will commence the project by carrying out a requirement analysis of the existing systems and data at Mingo County. An expert team from NIIT Technologies will interact with WVPTD team and understand in detail the current requirement and to build an efficient system for effective project management, problem resolution and time-based project delivery and acceptance. This will be achieved through:

- Review of existing tax maps available with WVPTD.
- Interaction with identified project team of WVPTD.
- Review of OrthoPhotos and secondary imagery provided by WVPTD.
- Review of Integrated Assessment System (IAS) data.
- Assess the specific requirements of data digitization and its quality, standards and specifications desired by the WVPTD.
- Assess the specific requirements of geo-referencing of the tax maps and its quality, standards and specifications desired by the WVPTD.
- Review of customization requirement on ArcGIS.
- Defining acceptance and delivery plan.

Interaction with identified project team of WVPTD

At the end of this phase NIIT Technologies will deliver a User Needs Assessment document jointly in agreement with WVPTD project team.

ii. Pilot Project

NIIT Technologies will initially perform a pilot project for the below mentioned activity on the district or set of tax maps provided by the county in order to provide an insight into the quality of maps, potential training needs, cost adjustments, our infrastructure capacity, strength of QC methodologies and work schedule.

iii. Data Inventory

NIIT Technologies will carry out the inventory of all the Tax maps, especially Parcel data in Urban and rural areas, road network, rail network, easements and in-land water. NIIT Technologies will prepare inventory lists of all the data with the observations. The inventory report along with information on errors, gaps and quality issues, will be submitted to the client for approval and necessary action. The

georeferencing, digitization and attribution will be carried out for the data passing the quality requirements.

Data Received Media: Serial no. of Hard Drive If any)		Data Size	
		Total no. of Folders	
Received Date:	[dd/mm/yy]	Total no. of Files	
Data Content Details			
Data able to read	Yes <input type="checkbox"/> No <input type="checkbox"/>		
Data able to unpacked	Yes <input type="checkbox"/> No <input type="checkbox"/>		
Detailed Description of Data content			
Description of Data content	<ul style="list-style-type: none"> • Size of Data after unzip • No. of directory • No. total file • List of files • File type counts • RTx Region • No of Copyright protected folder • List of Copyright protected files 		
Remarks			
List of Data Directory Attachments for References	Name of Attached .zip file		
Received By (Name)		Checked By (Name)	
Signature		Signature	
Date	[dd/mm/yy]	Date	[dd/mm/yy]

Figure 1: Sample of the Data Inventory Template

iv. Geodatabase Model

NIIT Technologies will utilize the existing Geodatabase model provided by WVPTD to carry out the current assignment. The provided data model will be reviewed and changes/update required, if any, will be communicated accordingly. NIIT Technologies will support WVPTD for updating any changes. The cost and time implications for the same will be mutually discussed between NIIT Technologies and WVPTD for further implementation.

v. Data Development/Digitization

NIIT Technologies proposes the following data digitization approach. However the workflow would be finalized in mutual consultation with WVPTD after a detailed requirement analysis.

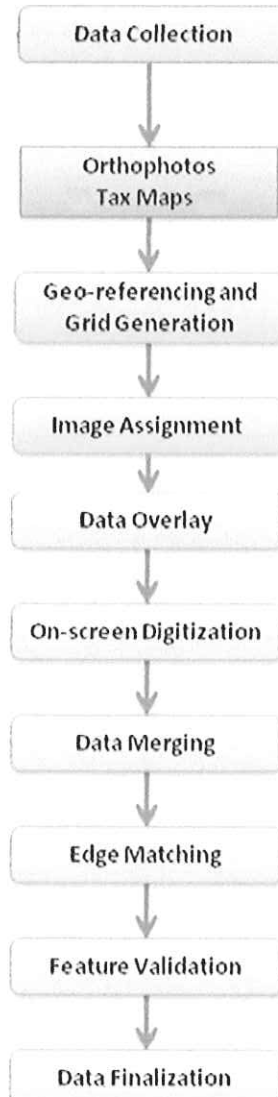


Figure 2: Proposed Data generation workflow

a) Rectification of Tax Maps

NIIT Technologies will carry out the geo-referencing for all the Tax Maps provided by the WVPTD keeping in view all the standards and tolerances as detailed in the RFQ.

b) Grid based Digitization (Production)

NIIT Technologies will make use of the Buckingham City sourced OrthoPhoto and create grids for systematic image allocation, data digitization, validation and quality control.

The GIS centerline road data provided by the WVPTD will be used to first establish the road Polygon with Standard Right Of Way (ROW).

Polygon of the larger land area "Islands" which will be formed along the ROW's boundary and will be further cut into the unit Parcel. The tax maps will be used to create the parcels verifying

the same from gridded Orthophoto. The method will ensure the best fit accuracy from the orthophoto and tax parcel data along the reference ROW.

NIIT Technologies will establish a standard workflow, within ArcGIS environment, based on the available orthophoto grids or sections to allocate resources and progress / process monitoring. This will help tile wise systematic creation of features to build the parcel data.

c) Data Merging and revalidation

After validation of all the created data sets, NIIT Technologies will merge the different grids and produce a section wise output. The ArcGIS data management tool will be used to perform this operation. After merging the final output will be re-validated with respect to the relative data source. Then the final output will be go for further accuracy analysis to ensure edge matching and data uniformity.

d) Edge-matching

This is the process of creating new topology and all the polygon features. The entire data set would be edge matched. To support the edge-matching process, NIIT will use the Edge Match tool on the Spatial Adjustment toolbar to quickly create links between features that are supposed to adjoin along a tile edge. The edge matched data will be reviewed through visual analysis to ensure feature accuracy and undertake necessary corrections, if any.

NIIT Technologies will ensure the quality of deliverable data with minimum cumulative errors. After the edge matching and before the attribution of the data the features will undergo a quality check for identifying and removal of Duplicate Features and IDs as stated by methods in following points:

- Duplicate IDs: In this method we will remove all the duplicate IDs as this is a unique feature in the Geodatabase.
- Invalid "Null" Values: In this step we will perform the separate Quality check for any invalid "Null" values created in features.

e) Data Attribution

The attribute data with the desired information will be provided by WVPTD to NIIT Technologies. This data will be standardized and corrected for errors, for all the 25,986 parcels in number.

f) Quality Check/ Quality Assurance

The Section wise data created will be subjected to quality control based on NIIT Technologies standards. Being an ISO 9001 – 2008 certified and CMMi Level 5 assessed company, NIIT Technologies follows standards based quality control procedures to achieve its goal of 'error-free' data delivery. The proposed quality methodology will include tile wise evaluation of digitized data to

compute both commission and omission errors along with digitization accuracy. Some of the quality parameters are discussed below.

Positional/Spatial Accuracy: Spatial accuracy of the digitized features will be determined by visual review in comparison to the relative source and data capture project specifications for 'best fit' accuracy. The data will be validated to ensure

- No feature or object is duplicated
- No missing features
- Feature interpretation errors
- Features do not overlap
- Features do not self-intersect

NIIT Technologies has established standard based procedures involving multiple checks and validations to ensure data quality and integrity. Overview of the same is provided in the following sections:

1. Database Validation checks

Check name	Description
Domain	Validates coded value and range domains to ensure that all values meet domain constraints
Relationships	Searches for records that are orphans or have improper cardinality in a relationship class
Subtype	Searches for feature classes with improper or null (optional) subtypes

2. Default checks

Check name	Description
Invalid Geometry	Finds features whose geometry is empty, nothing, or not simple as well as those with empty envelopes
Multipart Polygon	Finds polygon features with more than one part or that contain a hole
Non-Linear Segment	Finds polyline features with nonlinear segments such as arcs and curves
Polyline or Path Closes on Self	Finds paths and lines in polylines that touch or cross themselves

3. Duplicate Geometry checks

Check name	Description
Duplicate	Finds features of the same geometry type that are collocated and optionally

Geometry	share attributes. Features can be either from two different feature classes or within the same feature class.
Duplicate Vertex	Finds vertices from the same feature that are collocated or within a specified tolerance of one another.

4. Feature on Feature checks

Check name	Description
Geometry on Geometry	Finds features that have a specific spatial relationship, either from two different feature classes or within the same feature class
Intersection on Geometry	Finds features from one feature class that are within a specified tolerance of an intersection between two other features from two feature classes or within the same feature class
Polygon Overlap/Gap is Sliver	Finds gaps and overlaps between polygon features from two different feature classes

5. Polygon Checks

Check name	Description
Evaluate Polygon Perimeter and Area	Finds parts, rings, segments, or entire polygons for features whose area or perimeter is within a specified range
Invalid Hole Feature	Finds features that have a spatial relationship with holes in a polygon feature class
Polygon Sliver	Finds polygons below a specified thinness ratio and whose area is within a specified threshold, optionally

6. Table checks

Check name	Description
Execute SQL	Finds records based on a SQL query WHERE clause run against row attributes
Regular Expression	Finds records where values for string fields do not match the specified format
Table to Table Attribute	Finds values that match or do not match between feature class attribute fields and table fields
Unique ID	Searches for duplicate values in a table or feature attribute field across the entire database

7. Topology checks

Check name	Description
Find Dangles	Searches for polylines that have dangles within a specified tolerance
Topology Rules	Finds features that violate topology rules defined in the database
Parcels cannot overlap.	Adjacent parcels have shared boundaries.
Shared edges	Adjacent counties have shared boundaries. Counties must completely cover and nest within states.
Orphan	Finds topology edges that are not connected to the topology graph
Unnecessary Parcels	Finds adjacent polygons features that share a line and have attribute values that are identical on editable fields
Unnecessary Polygon Boundaries	Finds adjacent polygon features that share a boundary and have attribute values that are identical on editable fields

8. Advanced checks

Check name	Description
Composite	Finds records based on a series of Geometry on Geometry or Table to Table Attribute checks run on a single object class
Sampling	Generates a set of features from one or more layers

vi. Application Development Strategy

NIIT Technologies follows proven ETVX approach to carry out the system development, effectively perform the activities and thereby assure delivery involved in the development/customization of GIS application.

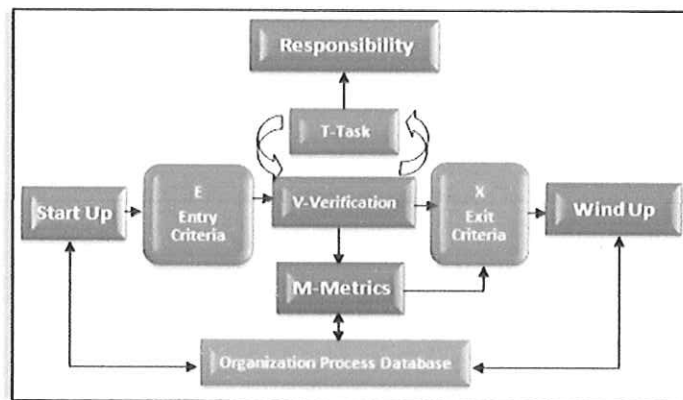


Figure 3: ETVX Approach

For every activity to be performed in the various phases of the development lifecycle there is a well-defined Entry Criterion.

The **Entry Criteria** identifies the nature of information required for initiation of the activity. The idea of laying down the Entry Criteria is to avoid re-sequencing of tasks, due to lack of information required during the performance of the activity.

The tasks to be carried out under each activity will be defined. They specify the path to be taken for transformation of the Input to the specified output. It gives an order and a direction to ensure that expected results are achieved. For each tasks the person/role Responsible for its execution is clearly defined. NIIT TECHNOLOGIES has a standard process framework, which defines the tasks for various activities under each phase of development life cycle. Normally this is tailored to suit the needs of the project.

Verification and Validation are control points which provide mid-way corrections to avoid any major lapses. Setting up of control points ensures that no irreversible or irreparable damage is done. For any task the verification and validation to be done along with the roles involved is identified as per the process framework. Peer Reviews and Unit testing are example of verification and validation.

Metrics are used to measure the performance of the tasks and verification process. NIIT Technologies has a well-defined framework, which details the metrics to be used, the collection points, techniques to be employed for collation and the variations acceptable in the measures.

The **Exit criterion** identifies the conditions, which must be fulfilled to end the activity.

vii. Data submission

NIIT Technologies will deliver the cleaned and quality passed Parcel polygon feature class and finished tax maps along with the QA/QC report for the delivered data

viii. Client Review

After the data is given to for the review, WVPTD /Mingo County will check the data for the accuracy and standards of best fit as defined in the user need analysis. Any errors found in the data will be handed over to NIIT Technologies.

Responsibilities of WVPTD/Mingo County:

- 1) The UAT will be carried out by the county as per the mutually agreed data validation criteria.
- 2) It is assumed that WVPTD/Mingo County will facilitate the feedback with the report within agreed timeframe after the data is delivered.

ix. Final Data Delivery

NIIT Technologies will deliver the cleaned and quality passed Parcel polygon feature class after correcting all the errors as reported by WVPTD/Mingo County. NIIT Technologies will undertake the necessary corrections as per the feedback.

3.3 Additional Requirements

NIIT Technologies will deploy its experienced resources to provide the WVPTD/Mingo County with:

- I. Procedures, tools and workflows for post project maintenance as needed by the County.
- II. Assist the County installing the map book and provide adequate assistance in maintenance of tax maps.
- III. Submit WVPTD one time overhead cost analysis
- IV. Provide WVPTD and County all the Georeferenced .tiff files and associated spatial data.
- V. A final report for project milestone and/or results along with the final tracking log used during monthly progress report.

4. Compliance to Appendix B – Technical Information Specification

S.No.	Requirement	Complied/Not Complied	Response
1	Spatial Definitions	Complied	NIIT Technologies will implement the North American Datum of 1983 (NAD83) along with the West Virginia State Plane Coordinate System (in feet) for the digitized tax maps.
2	Tax Map Accuracy Standards	Complied	NIIT Technologies will ensure that its resources deployed for this project will comply to the horizontal accuracy thresholds to meet or exceed 1:4800 or +/- 13.33 ft (National Map Accuracy Standards in WV § 4.2.a.1). NIIT Technologies will perform a detailed requirement analysis of the existing maps with the state for any horizontal inaccuracies and inherent spatial problems and will act accordingly.
3	Data Sources	Complied	NIIT Technologies will utilize the core geographic layers provided by the State.
3.1	Digital Color Orthophotography	Complied	NIIT technologies will utilize the orthophotos provided by the State.
3.1.a	Secondary Imagery	Complied	NIIT technologies as and when required will utilize the secondary imagery provided by the State for as an aid for digitizing the tax map elements. All the deviation from RFQ specifications emerged due to the usage of these secondary images will be documented in the attributes and metadata of the layer and also in the project documentation.
4	Map Sheets and Index Grids	Complied	NIIT Technologies will digitally create the index sheet using geo-rectified tax map boundaries for

S.No.	Requirement	Complied/Not Complied	Response
			<p>into a data layer in order to develop a Digital map book using Data Driven Pages toolset of ArcMap. This data layer will be having necessary attributes such as fixed scale, tax map rotation and unique jurisdictional identifiers.</p>
5	Roads	Complied	<p>NIIT Technologies will perform a requirement analysis as mentioned in above requirement analysis section and will finalize the user needs assessment document in joint agreement by the County and NIIT Technologies.</p> <p>NIIT Technologies will digitize the centre line data provided by the county and will further prepare the right-of-way (ROW) by creating buffers of widths specified from authoritative data source from the county.</p> <p>NIIT Technologies will verify for the overlap of the parcel polygons over the created buffers and edit the parcel polygons which overlap the ROW.</p> <p>During requirement analysis phase NIIT Technologies will perform a gap analysis in requirement analysis phase for the road network data in coordination with county and WVDOH Right-of-Way Division in order to determine the addition/removal of roads.</p> <p>NIIT Technologies will identify and resolve procedural methods for road network data</p> <p>NIIT Technologies will use the process of digitization as mentioned in Approach and Methodology section.</p>
6	Railroads	Complied	<p>NIIT Technologies will create the ROW for railroads in similar manner as suggested in above section for roads.</p>

S.No.	Requirement	Complied/Not Complied	Response
7	Easements	Complied	NIIT Technologies will digitize an easement lines discernible in the imagery based on the specification determined by the county.
8	In-Land Water	Complied	<p>NIIT Technologies will digitize the in-land water (waterway, bank, or island) within hydrographic data layer.</p> <p>Based on the provision of high/low water level data by the county, NIIT Technologies will be able to reflect in the high/low water level within the hydrographic layer.</p>
9	Parcel Layer Attributes	Complied	NIIT Technologies in requirement analysis phase will map various potential stakeholders who are using the GIS parcel data and will also map the required fields of Integrated Assessment Data (IAS) based on the user's needs to update the existing Geodatabase design with the county approved set of fields.
10	Tax Map Rectification	Complied	NIIT Technologies will use orthophotographs provided by the county for geo-rectification of the scanned tax maps in conformance to the specified industry standards and in adherence to the steps outlined in the RFQ.
10.1	Control Points and Transformations – 1 st Order Affine	Complied	NIIT Technologies will establish the control points in adherence to the respective RFQ requirement.
10.2	Geo-rectification Difficulties	Complied	<p>NIIT Technologies will follow a minimal error tolerance for roads to follow the roads on the imagery in intent to preserve the shape of the parcels in the map.</p> <p>If in any case the tax map is inherently inaccurate NIIT Technologies will follow the respective process as specified in the RFQ.</p>

S.No.	Requirement	Complied/Not Complied	Response
11	Tax Map Index Grid	Complied	As mentioned above, NIIT Technologies will create a index map using data driven pages toolset and each polygon feature of the index map layer will contain the attributes as specified in the RFQ.
12	Vectorization of Index Parcels	Complied	<p>NIIT Technologies during requirement phase in consultation with West Virginia Property Tax Division (WVPTD) will map the inaccuracies in the legal descriptions for rural areas to signify the weak points in county's base layers in consideration to the future maintenance efforts of the county.</p> <p>NIIT Technologies will use ArcGIS topology validation/snapping tool available with the county in order to eliminate silvers, gaps or overlaps within the digitized parcel layer.</p>
12.1	Coordinate Geometry (COGO)	Complied	During the requirement analysis NIIT Technologies will identify hotspots if any such as overlaps, gaps and slivers and request the county for deeds, plats and related material necessary for use of ArcGIS COGO tools
13	Tax Parcel Attribute Tagging	Complied	<p>NIIT Technologies will adhere the Tax Parcel Attribute Tagging requirements for the following:</p> <ul style="list-style-type: none"> • "RootID" field for the relational link to the IAS database. • "PID" field for each parcel polygon. • The other attributes listed as will be detailed in the finalized user needs assessment document.
13.1	Special PIDs and Generic Parcels	Complied	NIIT Technologies will provide the PIDs to all vector layers as specified in the respective RFQ

S.No.	Requirement	Complied/Not Complied	Response
			requirement.
14	Annotation	Complied	NIIT Technologies will create the annotation objects listed in the requirement analysis phase adhering to the respective requirement of the RFQ.
15	IAS Data Linkages	Complied	<p>NIIT Technologies will link the IAS database with the GIS parcel polygons using "Root ID" field as mentioned above in Tax Parcel Attribute Linking requirement.</p> <p>NIIT Technologies will propose software customization based on the detailed requirement gathering in the requirement analysis phase for the following:</p> <ul style="list-style-type: none"> • Functional interface for the GIS graphic data and IAS textual data. • Compatible interface with Esri Software. • Customization of queries and reports.
16	Metadata	Complied	NIIT Technologies will build the metadata for the parcel dataset meeting the North American Profile (NAP) of ISO 19115, the FGDC (1998). It will contain the entire data finalized during the requirement analysis phase.
17	Monthly Deliverables	Complied	NIIT Technologies will provide monthly progress in an excel sheet as per the documentation specified in the RFQ.
18	Finished Tax Maps	Complied	NIIT Technologies will adhere to the requirement of Finished Tax Maps intended in the RFQ.
19	Data Quality Objectives (DOQ)	Complied	NIIT Technologies will follow its QA/QC procedures as specified in the proposed approach and methodology section (above) and

S.No.	Requirement	Complied/Not Complied	Response
			adhering to the standards and requirements detailed in the respective section of the RFQ.
19.1	Geo-rectifying Tax Maps	Complied	NIIT Technologies will follow the guidelines and standards for geo-rectifying the tax maps as detailed in the RFQ corresponding section.
19.2	Other QC Mechanisms	Complied	NIIT Technologies will follow the guidelines and standards for other QC mechanisms as detailed in the RFQ corresponding section.

5. Project Management

5.1 Project Management Overview

Our overall approach to Project Management is based on the premise of one Manager having “total responsibility and accountability” to meet the cost, schedule and technical objectives of the project. This approach is implemented by utilizing structured processes for defining and organizing all elements of the project and providing clear and concise delegation of responsibility and accountability to the supporting organization for production of specific work products.

The management process includes the responsibility for day-to-day management of the overall performance of the project. The baseline for measurement of progress and success are key dates for Deliverables, Acceptance criteria, Dependencies, Quality Assurance requirements, Change Management requirements, periodic reporting requirements and any other project specific requirements.

The Project Manager carries the total responsibility of successful implementation of the project throughout the Data Development Life Cycle. Consultants provide additional, independent and objective information to management. The Critical Success Factors for project control are:

1. Stringent reviews and reporting
2. Product quality through effective Process controls
3. Measurements through Metrics – both Process and Product
4. Regular communication and feedback

5.2 Review and Reporting Mechanism

NIIT Technologies will follow the below mentioned steps for Reviews and Reporting:

- NIIT’s Project Manager will interface with the Project Manager of WVPTD.
- Regular reporting mechanism and frequency shall be formulated at the project start up and that shall become the part of the project plan. There will be day to day reviews for progress reporting by the different consultants.
- Regular monthly review meeting will be held to exchange status, discuss problems, bottlenecks and solutions.
- Project Steering Committee meeting will address issues, which cannot be resolved in the Project Management Committee review meetings or call for a change in the review and reporting procedures.
- Each of these reviews will cover various aspects of the project such as Risk management, quality assurance, project progress, progress against project baselines and the status of configuration management.

5.3 Query Management

During the course of the project, there will be queries raised by NIIT related to the functional and technical issues of the project to WVPTD. The response to the queries will be expected as per the time for response to be set at the start of the project.

5.4 Reception and Approval of Deliverables

NIIT Technologies will send deliverables to WVPTD as per the project deliverable plan. After the receipt of the deliverables, WVPTD will immediately give confirmation to NIIT once WVPTD has received the deliverables, they will review them within the agreed time frame. After reviewing the deliverables, WVPTD will need to approve them formally and this will be communicated to NIIT Technologies. In case, some changes are required by WVPTD in those deliverables, the same will be communicated to NIIT Technologies Project Manager. The necessary changes will be incorporated and sent same back to WVPTD for approval.

5.5 Escalation Mechanism and Issue Management

Effective Management of Project issues is a critical component of effective Project Control and Management. These issues need to be documented, monitored, and resolved in a consistent and timely manner. And as a last resort, when an issue remains unresolved it must be escalated to the Consulting Services Head.

A Project issue is an unresolved problem or unanswered question that is impeding the progress of a Project. Unresolved issues may arise during any Phase of the development life cycle, but are typically recognized while employing various techniques for controlling Projects, such as Progress Monitoring or Change Management.

These issues can be attributed to many reasons, for example:

- Resource constraints
- Technical problems
- Functional questions awaiting clarifications from WVPTD.
- Organizational problems

An outstanding issue is raised, and documented only when the Project Team is not able to resolve the issue i.e. outstanding issues should be dealt with at the lowest possible level. An issue need not be formally raised if it can be resolved as a byproduct of normal Project work.

All unresolved outstanding issues are raised during the Project Review Meeting, and reported in the Project Status Report.

Escalation Issues include:

- Actions needed to resolve / by whom
- Impacts / deadlines to be respected
- Time frames / completion dates
- Evolution of outstanding issues

Issue Escalation

Issues tend to escalate over time and may be handled as follows:

The issue is analyzed during a Project Review meeting with the Project Manager and Team Leader where actions for resolving it are decided on.

The issue may be settled then and there.

- Actions are identified and responsibilities assigned.
- The issue is monitored to ensure that appropriate action is taken.
- Major issues may need to be reported to the Consulting Services Head.
- Monitoring continues until the issue is resolved.

The Project Manager is the logical owner of the Issue Management process, and administers it for the entire Project. Project Manager is responsible for recognizing and defining issues and their impacts, and managing them.

Basic Principles

Basic principles for managing issues when controlling a Project include:

- Effective Issue Management requires good Project Management practice and NIIT Project Manager shall place it as one of the highest priorities.
- A process which enables good identification, documentation, escalation and resolution of issues is essential for any Project.
- **Identification** means spotting and anticipating issues early enough to enable action to limit their damage;
- **Documentation** means having a process in place to record the information required to understand the problem and its solution, and for logging progress towards resolution;
- **Escalation** means bringing the issue to the attention of the decision makers, at whatever level, and ensuring the ownership of the issue;
- **Resolution** means evaluating solutions, planning their execution, and monitoring completion.
- Institute and document the control techniques to be employed.
- Solve all problems as they emerge, at whatever level.
- Raise a formal issue at a Project Status meeting only when it cannot be solved within the boundaries of normal Project Management practice.

- Non ignorance and non-procrastination, otherwise resulting in increased costs and demoralization
- Issues are resolved not when appropriate actions are identified, but when those actions have resolved the problem.
- The Project Status Report may be used to document the issue, and as a log of all outstanding issues.

Description of the Process

- **Define the Issue:**
 - A potential issue can be identified by WVPTD or member of the Project Team. The person who raised the potential issue describes the potential issue during a Project Status meeting, where the issue is discussed and a decision is made whether to confirm it as an official issue. If so, the issue is documented on the Project Status Report, with a minimum inputs such as:
 - ✓ Project name
 - ✓ Date raised
 - ✓ Raised by (their own name)
 - ✓ Description of issue
 - New issues are reviewed with Project Manager. The Review analyzes these issues and identifies actions for resolving it. The issues may be settled during this initial Review.
- **Assign Responsibility:**
 - The Project Manager prepares the issue for assignment by assessing the impact and recommending actions.
 - Each issue would be assigned to an individual of the project team for resolution. The issue may be assigned to a Team member, the Project Manager or the Team Leader. The issue may also be escalated up and resolved in a Project Review with the Consulting Services Head.
 - A target date must be set for completion of the actions to resolve the issue. The issue is monitored by the Team Leader.
- **Resolve the Issue:**
 - The resolution of a given issue will be achieved over time through the execution of the assignment issued by the Project Manager to the designated Project resources. This will be dictated by the specific nature of the problem and the definition of the solution.
 - During this execution, the Team Leader in conjunction with the Project Manager may decide that it is appropriate to treat the issue as a change in scope, and invoke the Change Management process.

▪ **Monitor Progress**

- As the issue is resolved, the Project Status Report is updated, and the issue will be formally closed at the next Project Review meeting.
- At all Stages the issue will be monitored by the Project Manager, and Project plan will be adjusted as appropriate.
- Document Results
- The Project Manager shall ensure that the Project Status Report is updated (e.g. resolution, status closed as resolved) and distributed.
- If the Issue cannot be resolved at the Project Manager level, it is escalated to the Project Steering Committee for resolution.

5.6 Risk Analysis and Mitigation

During the lifecycle of a project; there may be risks involved. Each of these has a variant degree of impact on the execution of the project. Hence all such risks need to be identified at the beginning itself along with their mitigation plan. Risk identification and mitigation starts from the proposal stage and addressed throughout the project. NIIT Technologies will create and manage the risk plan and will be reviewed and kept live throughout the project lifecycle thus ensuring a proactive response to probable risks.

NIIT Technologies considers risk management as one of critical elements of this engagement. Our methodology for risk ranking and measurement and risk assessment are tailored with the client specific requirement & processes. Our risk management method is provided below and is followed by role it plays in testing.

The schematic below provides an overview of the Risk Management and Control Process. The major activities in Risk Management are:

- Identification of Risks
- Analysis of risks
- Mitigation of risks
- Tracking
- Communication

Management of these above mentioned risks are schematically shown in the below figure.

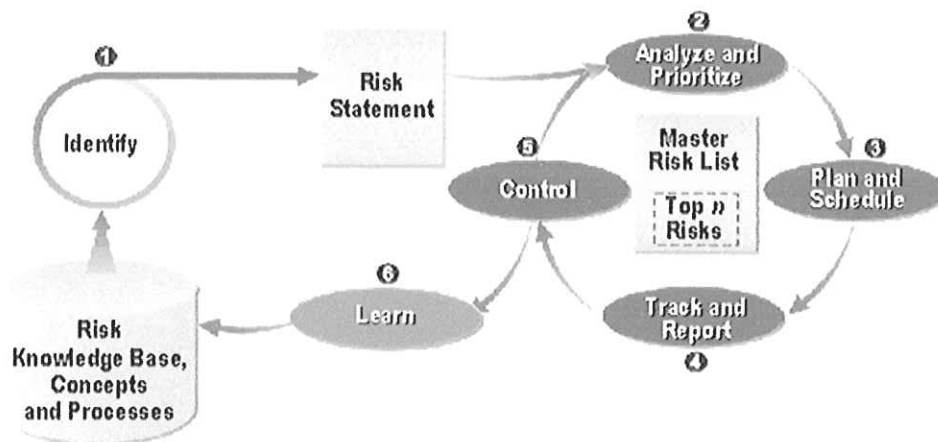


Figure 4: Risk Management Plan

Identification of Risk: Risks will be identified initially during strategy exploration and risk mitigation of 'Boot Up' phase and then revisited at every stage in the project with the involvement of the client at each stage.

NIIT Technologies proposes to use a taxonomy based questionnaire methodology for identification of risks. The use of this methodology will ensure that risks pertaining to technology, process and environment are all identified. The risks will then be documented in a standard format.

Analysis of Risk: Once the risks have been identified an analysis will be done to assess the probability of their occurrence and the resulting impact. A risk factor will be thus arrived at based on this and the risks prioritized accordingly. Given below is one such representation of the same. (This data has been taken from one of our current engagements).

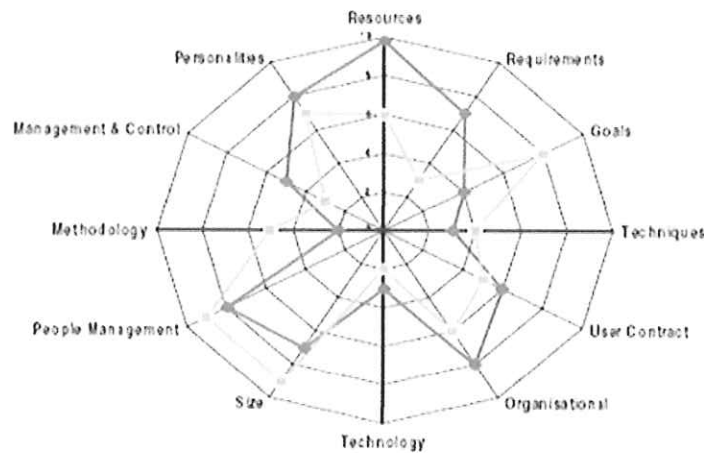


Figure 5: Analysis of Risk

The risks will then be mapped analytically on parameters of likelihood and consequent impact. A sample is attached below:

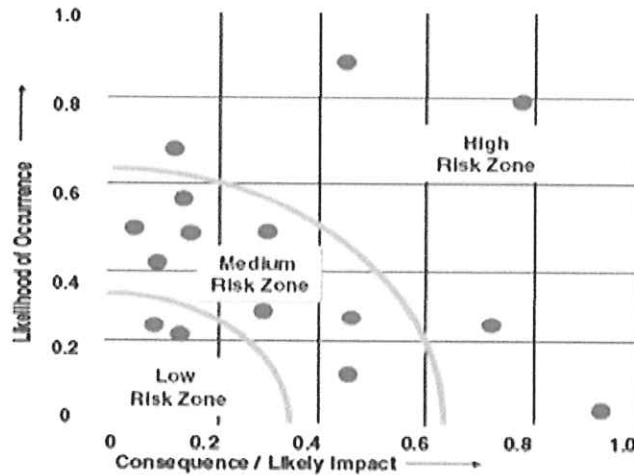


Figure 6: Risk Mapping

Mitigation of risks: After prioritization, a mitigation plan will be drawn for each risk in order to reduce its impact. NIIT intends to fully capitalize on and incorporate the experience from previous projects in drawing a robust mitigation plan.

Tracking: During the execution of the project and delivery of the service, the risks will be revisited and mitigation plans revised. Any new risk identified at that stage will also be analyzed and tracked. Successfully mitigated risks will be closed.

Communication: The Project Manager communicates the risks associated with the project to all the stakeholders in the project. The mechanism to be used will be decided in consultation with the WVPTD (and all stakeholders) and documented in the project plan. An electronic risk register will be maintained and updated at regular intervals.

6. Deliverables

NIIT Technologies will submit the following deliverables to WVPTD/Mingo County:

1. User Needs Assessment document
2. Data Inventory Document
3. ArcGIS Geodatabase containing a seamless, countywide surface polygon parcel feature class along with attributes and associated IAS data attached to each polygon.
4. Finished tax maps including digital map series established by districts and maps numbers compatible with the most current version of ArcGIS map series functionality.
5. Final map document (MXD) of map grids for county's existing map series.
6. Digital annotation and symbols existing on the county tax maps and digitized road centre line and road buffers.
7. Lot lines, hydrology, land hooks.
8. Configuration of MXD document for auto generation of tax maps into PDF.

7. Assumptions

NIIT TECHNOLOGIES will perform its services for the WVPTD intended scope of work considering the following assumptions:


1. All the necessary source data like tax maps, street centerline data, hydrology data, orthophotographs, and secondary imagery will be provided by WVPTD/Mingo County.
2. All the necessary infrastructure hardware, software etc. will be provided by WVPTD/Mingo County for onsite phase of the project (User needs study and deployment).
3. The scope of work does not involve any survey/data creation activity.
4. The centerline data for road and rail network will be provided by WVPTD/Mingo County.
5. The IAS data provided by WVPTD/Mingo County will be in compatible format with Esri ArcGIS.
6. QC benchmark guidelines of WVPTD will be provided by County / West Virginia State Agency to NIIT Technologies.
7. Parcels will be directly created from the other source materials. There are possibilities of mismatch between Tax map and the Parcels.
8. WVPTD/Mingo County will provide the existing Geodatabase model and the production Geodatabase with all the Feature Classes.
9. All the necessary customization will be done only on Esri ArcGIS software.

8. Tax Cost Sheet

COUNTY	Digital Tax Parcel Polygon Data	Cost	Finished Tax Map Publication	Cost
MINGO	25,986	\$95,495	369	\$17,225
	Total Cost	\$95,495	Total Cost	\$17,225

Additional Onsite support can be provided at the premises of County at an additional cost (optional) if the county wants the services of NIIT GIS Project Manager – US\$ 10,500 per month

NIIT intends to provide the Offsite remote support from NIIT's Headquarters in Atlanta, Georgia or from regional offices in Vienna, Virginia. This is provided at no additional cost.

Phone# & Fax#	Email Address	Date	Vendors Name and Signature
(703)-477-0441 (770)-551-9229	Subash.sivakumaran@niit-tech.com	07/16/2012	NIIT TECHNOLOGIES INC. 

CERTIFICATION AND SIGNATURE PAGE

By signing below, I certify that I have reviewed this Solicitation in its entirety; understand the requirements, terms and conditions, and other information contained herein; that I am submitting this bid or proposal for review and consideration; that I am authorized by the bidder to execute this bid or any documents related thereto on bidder's behalf; that I am authorized to bind the bidder in a contractual relationship; and that to the best of my knowledge, the bidder has properly registered with any State agency that may require registration.

NIIT TECHNOLOGIES INC.

(Company)

SUBASH SIVAKUMARAN, SENIOR BUSINESS MANAGER

(Representative Name, Title)

(703)-477-0441 | (770)-551-9229

(Contact Phone/Fax Number)

07/16/2012

(Date)

ADDENDUM ACKNOWLEDGEMENT FORM
SOLICITATION NO.: TAX12007

Instructions: Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification.

Acknowledgment: I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

Addendum Numbers Received:

(Check the box next to each addendum received)

- | | |
|--|--|
| <input checked="" type="checkbox"/> Addendum No. 1 | <input type="checkbox"/> Addendum No. 6 |
| <input type="checkbox"/> Addendum No. 2 | <input type="checkbox"/> Addendum No. 7 |
| <input type="checkbox"/> Addendum No. 3 | <input type="checkbox"/> Addendum No. 8 |
| <input type="checkbox"/> Addendum No. 4 | <input type="checkbox"/> Addendum No. 9 |
| <input type="checkbox"/> Addendum No. 5 | <input type="checkbox"/> Addendum No. 10 |

I understand that failure to confirm the receipt of addenda may be cause for rejection of this bid. I further understand that any verbal representation made or assumed to be made during any oral discussion held between Vendor's representatives and any state personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

NII TECHNOLOGIES INC.

Company



Authorized Signature

07/16/2012

Date

NOTE: This addendum acknowledgement should be submitted with the bid to expedite document processing.
Revised 6/8/2012

STATE OF WEST VIRGINIA
Purchasing Division

PURCHASING AFFIDAVIT

West Virginia Code §5A-3-10a states: No contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and the debt owed is an amount greater than one thousand dollars in the aggregate.

DEFINITIONS:

"Debt" means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.

"Debtor" means any individual, corporation, partnership, association, limited liability company or any other form or business association owing a debt to the state or any of its political subdivisions. "Political subdivision" means any county commission; municipality; county board of education; any instrumentality established by a county or municipality; any separate corporation or instrumentality established by one or more counties or municipalities, as permitted by law; or any public body charged by law with the performance of a government function or whose jurisdiction is coextensive with one or more counties or municipalities. "Related party" means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceeds five percent of the total contract amount.

EXCEPTION: The prohibition of this section does not apply where a vendor has contested any tax administered pursuant to chapter eleven of this code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

Under penalty of law for false swearing (*West Virginia Code* §61-5-3), it is hereby certified that the vendor affirms and acknowledges the information in this affidavit and is in compliance with the requirements as stated.

WITNESS THE FOLLOWING SIGNATURE

Vendor's Name: NIIT Technologies Inc.

Authorized Signature: [Signature] Date: 07/16/12

State of Georgia

County of DeKalb, to-wit:

Taken, subscribed, and sworn to before me this 16th day of July, 2012

My Commission expires Jan 7, 2015, 20



NOTARY PUBLIC: [Signature]