

**SOLICITATION OF EXPRESSIONS OF
INTEREST**

**West Virginia Statewide Addressing and Mapping Board
(WVSAMB)**

EOI# SAM-0202

November 7, 2002

TABLE OF CONTENTS

PART 1. GENERAL INFORMATION	1
1.1 PURPOSE.....	1
1.2 PROJECT DESCRIPTION.....	2
1.3 EOI FORMAT.....	2
1.4 INQUIRIES.....	2
1.5 VENDOR REGISTRATION.....	3
1.6 ORAL STATEMENTS AND COMMITMENTS.....	3
1.7 ECONOMY OF PREPARATION.....	3
1.8 LABELING OF THE EOI SECTIONS.....	3
1.8.1 EXPRESSIONS OF INTEREST.....	3
1.8.2 CONTRACT TERMS AND CONDITIONS.....	4
1.8.3 COPYRIGHTS AND PROPRIETARY INFORMATION.....	4
1.8.4 INFORMATIONAL SECTIONS.....	4
1.9 PROPOSAL FORMAT AND SUBMISSION.....	4
1.9.1 RESPONSE.....	4
1.9.2 COPIES.....	4
1.9.3 DELIVERY.....	5
1.10 REJECTION OF EXPRESSIONS OF INTEREST.....	5
1.11 INCURRING COSTS.....	5
1.12 ADDENDA.....	5
1.13 INDEPENDENT PRICE DETERMINATION.....	6
1.14 PRICE QUOTATION.....	6
1.15 PUBLIC RECORD.....	6
1.15.1 SUBMISSIONS ARE PUBLIC RECORD.....	6
1.15.2 WRITTEN RELEASE OF INFORMATION.....	6
1.15.3 RISK OF DISCLOSURE.....	6
1.16 SCHEDULE OF EVENTS.....	6
1.17 MANDATORY PRE-BID CONFERENCE: NOT APPLICABLE.....	7
1.18 BOND REQUIREMENTS: NOT APPLICABLE.....	7
1.19 NO DEBT AFFADAVIT.....	7
PART 2. OPERATING ENVIRONMENT AND BACKGROUND	7
2.1 LOCATION.....	7

2.2 BACKGROUND	7
PART 3. PROCUREMENT SPECIFICATIONS.....	8
3.1 GENERAL REQUIREMENTS	8
3.2 SPECIAL TERMS AND CONDITIONS.....	8
3.2.1 BID AND PERFORMANCE BONDS: NOT APPLICABLE	8
3.2.2 INSURANCE REQUIREMENTS.....	8
3.2.3 LICENSE REQUIREMENTS	8
3.2.4 NO DEBT AFFIDAVIT	8
3.2.5 MINIMUM VENDOR QUALIFICATIONS	8
3.2.6 LITIGATION BOND: NOT APPLICABLE.....	9
3.3 GENERAL TERMS AND CONDITIONS.....	9
3.3.1 CONFLICT OF INTEREST.....	9
3.3.2 PROHIBITION AGAINST GRATUITIES.....	9
3.3.3 CERTIFICATIONS RELATED TO LOBBYING.....	9
3.3.4 VENDOR RELATIONSHIP	10
3.3.5 INDEMNIFICATION.....	10
3.3.6 CONTRACT PROVISIONS	10
3.3.7 GOVERNING LAW.....	11
3.3.8 COMPLIANCE WITH LAWS AND REGULATIONS	11
3.3.9 SUBCONTRACTS/JOINT VENTURES.....	11
3.3.10 TERM OF CONTRACT & RENEWALS.....	11
3.3.11 NON-APPROPRIATION OF FUNDS.....	12
3.3.12 CONTRACT TERMINATION	12
3.3.13 CHANGES.....	12
3.3.14 INVOICES, PROGRESS PAYMENTS, & RETAINAGE	12
3.3.15 LIQUIDATED DAMAGES: N/A	13
3.3.16 RECORD RETENTION (ACCESS & CONFIDENTIALITY).....	13
3.4 SCOPE OF WORK.....	13
3.4.1 PROJECT EXTENT	13
3.4.2 PERFORMANCE CRITERIA/ PRODUCT SPECIFICATIONS	14
3.5 TECHNICAL PERFORMANCE CRITERIA	14
3.5.1 TECHNICAL IMAGERY AND RELATED SPECIFICATIONS.....	15
3.5.1.1 HORIZONTAL ACCURACY REQUIREMENTS.....	15
3.5.1.2 AERIAL IMAGERY	16

3.5.1.3	IMAGERY TYPE: NATURAL TRUE COLOR (24 BIT).....	16
3.5.1.4	TEMPORAL REQUIREMENTS	17
3.5.1.5	TILE SIZE BY RESOLUTION/SCALE	17
3.5.1.6	EXTENT AND DISTRIBUTION OF IMAGERY.....	18
3.5.1.7	ORIENTATION AND UNITS	19
3.5.1.8	CAMERA AND FOCAL LENGTH.....	20
3.5.1.9	OVERLAP	20
3.5.1.10	AIRBORNE GLOBAL POSITIONING SYSTEM (ABGPS)	20
3.5.1.11	ALTERNATE SENSOR CAPABILITIES	20
3.5.2	PROJECT CONTROL AND ORIENTATION	21
3.5.2.1	PROJECT CONTROL.....	21
3.5.2.2	GROUND CONTROL REQUIREMENTS.....	21
3.5.2.3	PROCEDURES.....	21
3.5.2.4	PROCESSING	23
3.5.3	PHOTOGRAMMETRIC PROCESSING.....	23
3.5.3.1	SCANNING.....	23
3.5.3.2	ANALYTICAL AERIAL TRIANGULATION	23
3.5.3.3	PLANIMETRIC VECTOR COMPILATION	24
3.5.3.4	ORTHOPHOTO RECTIFICATION, MOSAICKING AND PROCESSING	29
3.5.3.5	ONBOARD SENSORS	31
3.5.3.6	DIGITAL TERRAIN MODEL (DTM)	31
3.5.4	PROJECT MANAGEMENT, CONTROL AND DELIVERABLES.....	33
3.5.4.1	OFF-SHORE LABOR	33
3.5.4.2	MANAGEMENT PLAN	33
3.5.4.3	ON CALL POINT OF CONTACT.....	33
3.5.4.4	PROJECT INITIATION MEETING AND PROJECT PLAN	33
3.5.4.5	POST-FLIGHT EVALUATION MEETING	33
3.5.4.6	STATUS MEETINGS	34
3.5.4.7	STATUS REPORTS.....	34
3.5.4.8	DATA DELIVERABLES.....	36
3.5.4.9	PROJECT SURVEY CONTROL AND BLIND QA POINT DELIVERABLES.....	37
3.5.4.10	AERIAL FILM AND RAW IMAGE FILE DELIVERABLES	40
3.5.4.11	AERIAL TRIANGULATION	41
3.5.4.12	DIGITAL TERRAIN MODEL (DTM)	42
3.5.4.13	PLANIMETRIC DATA AND DIGITAL ORTHOIMAGERY DELIVERY TILE FORMATS	43
3.6	VENDOR QUALIFICATIONS, EXPERIENCE AND REFERENCES.....	47

3.7	LEGAL AND GENERAL TERMS AND CONDITIONS.....	47
PART 4.	PROPOSAL FORMAT	47
4.1	VENDOR’S PROPOSAL FORMAT	47
4.2	EVALUATION PROCESS, SPECIFIC PROPOSAL INSTRUCTIONS AND CRITERIA FOR TECHNICAL PROFICIENCY SCORE	48
4.2.1	METHOD OF EVALUATION	48
4.2.2	SPECIFIC PROPOSAL INSTRUCTIONS	48
4.2.2.1	THE COMPANY	48
4.2.2.2	THE SERVICES	48
4.2.2.3	REFERENCES, QUALIFICATIONS, AND SUPPORTING MATERIALS	49
4.2.2.4	SPECIFIC PLAN FOR COMPLIANCE	49
4.2.2.5	PROJECT PLAN OF THE VENDOR.....	49
4.2.2.6	AERIAL OVERFLIGHTS.....	50
4.2.2.7	RE-FLIGHTS.....	50
4.2.2.8	PROFICIENCY	50
4.3	EVALUATION CRITERIA	50
4.3.1	DEVELOPMENT OF “SHORT LIST” OF VENDORS AND INTERVIEWS....	50
4.3.2	CRITERIA FOR ORAL PRESENTATION / INTERVIEWS	51
4.3.3	NEGOTIATIONS AND CONTRACT AWARD.....	51
4.3.4	ATTACHMENTS.....	52
4.3.4.1	ATTACHMENT A: TASKS (400’ DESIGN SCALE ONLY, STATEWIDE COVERAGE):	53
4.3.4.2	ATTACHMENT B: TASKS (100’ DESIGN SCALE ONLY, SUPPLEMENTAL AREAS 1-6).....	55
4.3.4.3	ATTACHMENT C: TASKS (100’ DESIGN SCALE ONLY, UNDEFINED URBANIZED AREAS.).....	56
4.3.4.4	ATTACHMENT D: GRID MAP TEMPLATE (400’ AND 100’; WV STATE PLANE NORTH AND SOUTH ZONES, NAD83).....	INSERT

LIST OF TABLES

TABLE 1	MEDIA DELIVERABLES:.....	44
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LIST OF FIGURES

FIGURE 1.	WEST VIRGINIA STATE PLANE NORTH AND SOUTH ZONES.....	60
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SOLICITATION OF EXPRESSIONS OF INTEREST

West Virginia Statewide Addressing and Mapping Board (WVSAMB)

EOI# SAM-0202

PART 1. GENERAL INFORMATION

1.1 PURPOSE

Pursuant to West Virginia Code Section 5G-1-1, et seq., the Acquisition and Contract Administration Section of the Purchasing Division (State), on behalf of the West Virginia Statewide Addressing and Mapping Board (“Board” or “SAMB” below) is soliciting Expressions of Interest (EOI) in establishing a contract through negotiations with a qualified engineering Vendor or engineering Vendor team with high-level photogrammetric capabilities to develop consistent statewide digital orthoimagery, digital terrain models and limited planimetric compilation of features needed to facilitate E-911 addressing and to otherwise support the West Virginia Statewide Addressing and Mapping Program (WVSAMP).

The intent is to develop base maps compatible for presentation at map scales of 1:4,800 (1”=400’; 400’ design scale) for the entire state, and at map scales of 1:1,200 (1”=100’; 100’ design scale) for selected supplemental urbanized areas of the state. A contract to support the West Virginia Statewide Addressing and Mapping Program will be awarded for aerial photography acquisition in the spring of 2003 during leaf-off conditions and subsequent delivery of digital orthoimagery and specified and state-selected optional planimetric mapping products within eighteen (18) months after contract award. At the State’s discretion, extensions or modifications to the initial contract may be considered for subsequent years.

All associated survey, photogrammetric, and planimetric data shall also be delivered to facilitate later third-party compilation of additional planimetric or topographic features.

The State and its Agents shall have the sole authority to define and prioritize the delivery of areas on a statewide, regional, or county by county basis to facilitate the goals of the addressing program, with the understanding that any scheduling shall accommodate reasonable aerial flyover, photogrammetric production, and planimetric mapping processes.

In addition to the requirements described in this Solicitation of Expressions of Interest (EOI), the SAMB is also accepting responses from qualified Vendors or Vendor teams regarding the addressing portion of SAMB’s mission as specified under West Virginia Code Section 24E-1-1, et seq. At this time, the SAMB has developed considerably less specific ideas on how it might accomplish the addressing portion of the project. Vendors are encouraged but not required to respond with teaming partners that can bring expertise both in statewide mapping and in E-911 addressing. A clear definition of the roles and relationships within and between teaming partners is requested. Vendors should concentrate on responding to SAMB’s immediate aerial photography and planimetric mapping needs, but Vendors are also invited to submit responses to SAMB’s addressing needs, including the submission of

anticipated concepts and methods of approach to the addressing project. However, only the proposed scope of work regarding the photogrammetric and planimetric mapping portions of this solicitation shall be considered for initial implementation by the State and the subject of negotiations pursuant to this EOI and West Virginia Code Section 5G-1-1, et seq.. The State expressly reserves the right, however, to limit any contract entered into pursuant to this EOI to the mapping activities described herein, or to certain aspects of the mapping activities. The State also reserves the right to issue any subsequent request or requests for proposals for specific statewide addressing work as it deems necessary to fulfill its requirements, and is under no obligation, implied or actual, to conform with Vendor's expectations regarding possible contracted work outside the scope of this EOI.

1.2 PROJECT DESCRIPTION

The Statewide Addressing and Mapping Board is charged with developing an integrated addressing and photogrammetric base mapping system for the entire State of West Virginia. The system includes aerial photography for the development of digital maps and a computerized Geographic Information System (GIS) that will interface with and contribute to the needs of the following: county Enhanced 911 services, state and local government agencies, telephone companies, US Postal Service, and utility systems, with a special focus on public safety and emergency response. The base maps and data to be supplied by the successful bidder will be a foundation of this system. The entire project undertaken by the Board is referred to herein as the "Project," or as the West Virginia Statewide Addressing and Mapping Program (WVSAMP or SAMP).

The aerial photography, digital orthoimagery, and planimetric feature specifications and performance criteria indicated in Part 3 have been established to provide for the development of high-quality base maps.

1.3 EOI FORMAT

This EOI has four (4) parts. "Part 1" contains informational sections, "Part 2" describes the background and working environment of the project, "Part 3" is a statement of the specifications for the services requested pursuant to this EOI, contractual requirements, and general terms/conditions, and "Part 4" explains the required format of the Vendor's response to the EOI, the evaluation criteria the State will use in evaluating the proposals received, and how the evaluation will be conducted.

1.4 INQUIRIES

Additional information inquiries regarding this EOI must be submitted in writing to the State Buyer with the exception of questions regarding proposal submission which may be oral. The deadline for written inquiries is identified in the Schedule of Events, Section 1.15. All inquiries of specification clarification must be addressed to:

Ron Price, Buyer Supervisor
Purchasing Division
2019 Washington Street, East
P.O. Box 50130
Charleston, WV 25305-0130

Phone: (304) 558-0492, x219
Fax: (304) 558-4115
Email: rprice@gwmail.state.wv.us

Absolutely NO contact shall be made by the vendor with any member of the EOI evaluation committee. Violation shall result in rejection of the bid. The State Buyer named above is the sole contact for any and all inquiries after this EOI has been released. Only questions submitted in writing, such as for an Addendum, shall become part of the official record and warrant a response. Vendors may submit questions to the State Buyer by email or fax.

1.5 VENDOR REGISTRATION

Vendors participating in the bid process should complete and file a *Vendor Registration and Disclosure Statement* (Form WV-1) and remit the registration fee. A Vendor is not required to be a registered in order to submit a proposal, but the **successful bidder must** register and pay the fee of forty-five dollars (\$45.00 US) prior to the award of an actual purchase order/contract. The WV-1 form is available at:
<http://www.state.wv.us/admin/purchase/VRC/wv1.pdf>

1.6 ORAL STATEMENTS AND COMMITMENTS

The Vendor must clearly understand that any verbal representations made or assumed to be made during any oral discussions held between Vendor's representatives and any State personnel (including without limitation, the SAMB) are **not** binding. Only the information issued in writing and contained in the final written contract, after approval by the Purchasing Division and the Office of the Attorney General, shall be binding.

1.7 ECONOMY OF PREPARATION

Proposals shall be prepared simply and economically, providing a straightforward, concise description of Vendor's abilities to satisfy the requirements of the EOI. Emphasis should be placed on completeness, brevity, and clarity of content.

1.8 LABELING OF THE EOI SECTIONS

The sections within this EOI contain instructions governing how the Vendor's proposal is to be arranged, submitted and to identify the material to be included therein. The Vendor's response should follow the sections as described herein and be labeled accordingly for ease of evaluation, especially Parts 3 and 4 of this EOI.

1.8.1 EXPRESSIONS OF INTEREST

A response to the sections included in Parts 3 and 4, and including Attachments A-D, will be the basis on which the Vendor's relative qualifications for the job will be assessed. Those Sections describe the anticipated approach by SAMB to the project. An indication of agreement or disagreement with that approach, plus a full explanation of how the vendor intends to comply, or alternatively, how the vendor intends to modify the approach stated in

the performance data in order to comply shall be required. **A simple “yes” or “no” response to these sections will not be considered adequate.**

SAMB is soliciting all anticipated concepts and proposed methods of approach to the project of the vendors. However, where an anticipated specification, term, or condition is “highly recommended,” “recommended” or stated as if it would be mandatory, the vendor’s response must specifically state whether or not the vendor agrees with the anticipated specification, term or condition, and must state whether or not the vendor’s own recommended approach complies with that anticipated by SAMB, or alternatively, how the vendor’s suggested approach differs from the one anticipated by SAMB and how that approach is, in the vendor’s opinion superior to that anticipated by SAMB.

1.8.2 CONTRACT TERMS AND CONDITIONS

A contract is anticipated to be arrived at pursuant to West Virginia Code Section 5B-1-1, et seq., and as per Section 4 of this EOI. Consistent with West Virginia law, under no circumstances will SAMB enter into, or be bound by, any contract terms or conditions not approved by the Purchasing Division or the Attorney General’s Office, notwithstanding any other oral or written indication whatsoever to the contrary.

1.8.3 COPYRIGHTS AND PROPRIETARY INFORMATION

Pursuant to West Virginia Code Section 24E-1-7, any writing or other work created by bidders in connection with or related to the project described herein, or this Request for Proposal, is a “work made for hire” within the meaning of the copyright laws of the United States, 17 U.S.C. Section 101, et seq. All right, title and interest to such writing or other work vests in the Board. Pre-existing copyrighted works or other proprietary information must be clearly identified as such. No proprietary information of the bidder may be submitted in response to this EOI without the express written permission of SAMB.

1.8.4 INFORMATIONAL SECTIONS

Any informational sections (such as “Instructions to Vendors”) included in the document do not require a response from the vendor. They are intended to aid the vendor in structuring an effective proposal capable of meeting the needs of the issuing agency.

1.9 PROPOSAL FORMAT AND SUBMISSION

1.9.1 RESPONSE

Vendors must complete a response to all mandatory specifications in order to be considered.

Each proposal must be formatted as per Parts 3 and 4 of this EOI. No other arrangement or distribution of the proposal information may be made by the bidder. Failure on the part of the bidder to respond to specific requirements detailed in the RFP may be basis for disqualification of the proposal. The State reserves the right to waive any informalities in the proposal format and minor irregularities. ***COPIES***

All copies must be submitted to the Purchasing Division **prior** to the date and time stipulated in the RFP as the opening date. All bids will be date and time stamped to verify official time and date of receipt. ***Electronic responses (e.g., pdf files) to the solicitation are not allowed.***

1.9.3 DELIVERY

Vendors mailing proposals should allow sufficient time for mail delivery to ensure timely arrival. The Purchasing Division cannot waive or excuse late receipt of a proposal which is delayed and late for any reason according to State Code 5A-3-11. Any proposal received after the bid opening date and time will be immediately disqualified in accordance with State law and the administrative rules and regulations.

Submit one (1) original EOI and fifteen (15) convenience copies to:

Ron Price, Senior Buyer
Purchasing Division
2019 Washington Street, East
PO Box 50130
Charleston, WV 25305-0130

All proposals must be received at the above addresses on or before Wednesday, 11/20/02, 1:30 PM (Eastern):

The outside of the response envelope or package(s) should be clearly marked with:

BUYER:	Ron Price
REQ #:	SAM-0202
Opening Date:	11/27/02
Opening Time:	1:30 PM (Eastern)

1.10 REJECTION OF EXPRESSIONS OF INTEREST

The State shall select the best value solution according to Section 5G-1-3 of the West Virginia State Code. However, the State reserves the right to accept or reject any or all proposals, in part or in whole at its discretion. The State reserves the right to withdraw this EOI at any time and for any reason. Submission of, or receipt by the State of proposals confers no rights upon the Vendor nor obligates the State in any manner.

A contract based on this EOI and the Vendor's proposal, may or may not be awarded. Any contract resulting in an award from this EOI is not valid until properly approved and executed by the Purchasing Division and approved as to form by the Attorney General.

1.11 INCURRING COSTS

The State and any of its employees or officers shall not be held liable for any expenses incurred by any bidder responding to this EOI for expenses to prepare, deliver the proposal, or to attend any mandatory pre-bid meeting or oral presentations.

1.12 ADDENDA

If it becomes necessary to revise any part of this EOI, an official written addendum will be issued by the State to all potential Vendors of record, and may be distributed via electronic means (e.g., email, .pdf file, etc).

1.13 INDEPENDENT PRICE DETERMINATION

A Contract will not be considered for award if the negotiated price was not arrived at independently without collusion, consultation, communication, or agreement as to any matter relating to prices with any competitor.

1.14 PRICE QUOTATION

NO "COST," "PRICE," OR "FEE" QUOTATION SHALL BE REQUESTED, INCLUDED, OR PERMITTED IN THE EOI RESPONSE. Costs shall only be considered during negotiations with the successful Vendor.

1.15 PUBLIC RECORD

1.15.1 SUBMISSIONS ARE PUBLIC RECORD

All documents submitted to the State Purchasing Division related to purchase orders/ contracts are considered public records. All bids, proposals, or offers submitted by bidders become public information and may be available for inspection during normal official business hours in the Purchasing Division Records and Distribution center after the award is complete and documents have been microfilmed.

1.15.2 WRITTEN RELEASE OF INFORMATION

All public information may be released with or without a Freedom of Information request. However, only a written request will be acted upon with duplication fees paid in advance. Duplication fees shall apply to all requests for copies of any document. Currently the fees are \$0.50/page, or a minimum of \$10.00 per request which ever is greater.

1.15.3 RISK OF DISCLOSURE

The only exemptions to disclosure of information are listed in West Virginia Code §29B-1-4. Primarily, only trade secrets as submitted by a bidder are the only exemption to public disclosure. The submission of any information to the State by a vendor puts the risk of disclosure on the vendor. The State will make a reasonable effort not to disclose information that is within the guidelines of §29B-1-4 and is properly labeled "proprietary information not for public disclosure". The State does not guarantee non-disclosure of any information to the public.

1.16 SCHEDULE OF EVENTS

The following schedule of events will apply:	DAY, DATE, TIME
Release of EOI:	Wednesday, 11/6/02
Written Questions Submitted from Vendors:	Monday 11/18/02, 4:30 PM
Addendum Issued:	Thursday 11/21/02
Expressions of Interest Opening Date:	Wednesday, 11/27/02, 1:30 PM

Submission of “Short List” to Purchasing:	Friday, 12/6/02
Vendor Interview Dates (week of)	Monday, 12/16/02
Final Ranking/Vendor Selected:	Friday, 12/20/02
Contract Award Date (approximate):	Wednesday, 1/15/03

The State may modify this schedule at any time, at their sole discretion.

1.17 MANDATORY PRE-BID CONFERENCE: NOT APPLICABLE

1.18 BOND REQUIREMENTS: NOT APPLICABLE

1.19 NO DEBT AFFIDAVIT

West Virginia State Code §5A-3-10a(3)(d) requires that all bidders submit an affidavit regarding any debt owed to the State. The affidavit *must* be signed and submitted prior to award. It is preferred that the affidavit be submitted with the proposal. The form is available at <http://www.state.wv.us/admin/purchase/vrc/debt.pdf>

PART 2. OPERATING ENVIRONMENT AND BACKGROUND

2.1 LOCATION

The West Virginia Statewide Addressing and Mapping Board (SAMB) conducts its regular meetings in Charleston, West Virginia. The current Chairman of the Board is the State GIS Coordinator located in Charleston, West Virginia. The Board currently meets twice monthly. SAMB has hired the team of Michael Baker, Jr., Inc. including Dr. Terry Keating to serve as Project Manager, who will be responsible for coordinating all technical work on the Project, including all mapping and GIS activities under an award pursuant to this EOI. The successful vendor will be required to cooperate with the Project Manager on all aspects of project design, engineering and implementation, and to provide periodic reports, as requested by the Project Manager and SAMB as work progresses.

2.2 BACKGROUND

The West Virginia Legislature created the West Virginia Statewide Addressing and Mapping Board in the 2001 session (Senate Bill 460, codified as *W. Va. Code Section 24E-1-1 et seq.*). The mission of the Board is to advance the infrastructure of West Virginia by overseeing two major tasks: 1) providing new high quality digital mapping of the entire State of West Virginia; and, 2) assigning a standard city-style address to every identifiable structure in the state. The Board is funded primarily under the Incentive Regulation Plan of Verizon West Virginia Inc., approved by the Public Service Commission of West Virginia in *Case Nos. 00-1318-T-GI, et al.*, on October 3, 2001.

The successful bidder’s principal contacts will be with the SAMB Project Manager and with the Board’s Chairman, West Virginia GIS Coordinator, Craig Neidig.

It is imperative that the project be completed as soon as possible. As a result, SAMB and its Project Manager have set forth their own specific ideas on performance data, concepts and approaches, as incorporated in this document. Vendors are not limited to those ideas, but are encouraged to submit their own ideas on performance data, concepts and approaches. The qualifications of each vendor, however, will be determined based not only on that vendor's experience, but also on how well the vendor's response demonstrates that the vendor has a grasp of the project being undertaken by SAMB and how well the vendor's vision of the project integrates into and dovetails with SAMB's vision.

PART 3. PROCUREMENT SPECIFICATIONS

3.1 GENERAL REQUIREMENTS

The Vendor shall furnish all labor, resources and materials required to develop and deliver digital orthoimagery and planimetric data for the State of West Virginia, in accordance with the specifications herein.

The State shall become the sole owner of all deliverables and associated intermediate data.

3.2 SPECIAL TERMS AND CONDITIONS

3.2.1 BID AND PERFORMANCE BONDS: *NOT APPLICABLE*

3.2.2 *INSURANCE REQUIREMENTS*

The successful bidder must have Professional Liability insurance coverage (including automotive liability insurance coverage) with policy limits of no less than \$1,000,000, and must list the Board as an "additional insured" as its interests may appear. Insurance certificates are required prior to award but are not required at the time of bid.

3.2.3 *LICENSE REQUIREMENTS*

The successful Vendor must present a Workers' Compensation Certificate upon award.

3.2.4 *NO DEBT AFFIDAVIT*

West Virginia State Code §5A-3-10a-(3)(d) requires that all vendors submit an affidavit of debt which certifies that there are no outstanding obligations or debts owing the State of West Virginia. The No Debt Affidavit is attached to this EOI which *shall* be completed, signed and returned *with* the vendor's proposal. If bidding a joint proposal, a No Debt Affidavit must be completed for both vendors.

3.2.5 *MINIMUM VENDOR QUALIFICATIONS*

As a minimum qualification for consideration, the Vendor or a member of the Vendor team shall be a registered Professional Engineer. Proof of licensure will be required.

3.2.6 LITIGATION BOND: NOT APPLICABLE

3.3 GENERAL TERMS AND CONDITIONS

By signing and submitting their proposal, the successful Vendor agrees to be bound by all the terms contained in Section 3 of this EOI.

3.3.1 CONFLICT OF INTEREST

The Vendor affirms that it, its officers or members or employees presently have no interest and shall not acquire any interest, direct or indirect which would conflict or compromise in any manner or degree with the performance or its services hereunder. The Vendor further covenants that in the performance of the contract, the Vendor shall periodically inquire of its officers, members and employees concerning such interests. Any such interests discovered shall be promptly presented in detail to the SAMB.

3.3.2 PROHIBITION AGAINST GRATUITIES

The Vendor warrants that it has not employed any company or person other than a bona fide employee working solely for the vendor or a company regularly employed as its marketing agent to solicit or secure the contract and that it has not paid or agreed to pay any company or person any fee, commission, percentage, brokerage fee, gifts or any other consideration contingent upon or resulting from the award of the contract. For breach or violation of this warranty, the State shall have the right to annul this contract without liability at its discretion, and/or to pursue any other remedies available under this contract or by law.

3.3.3 CERTIFICATIONS RELATED TO LOBBYING

The Vendor certifies that no federal appropriated funds have been paid or will be paid, by or on behalf of the company or an employee thereof, to any person for purposes of influencing or attempting to influence an officer or employee of any federal entity, a member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with the awarding of any federal contract, the making of any federal grant, the making of any federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment or modification of any federal contract, grant, loan, or cooperative agreement.

If any funds other than federally appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee or any agency, a member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with this federal contract, grant, loan, or cooperative agreement, the Vendor shall complete and submit a disclosure form to report the lobbying.

The Vendor agrees that this language of certification shall be included in the award documents for all sub-awards at all tiers (including subcontracts, sub-grants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly. This certification is a material representation of fact upon which reliance was placed when this contract was made and entered into.

3.3.4 VENDOR RELATIONSHIP

The relationship of the Vendor to the State shall be that of an independent contractor and no principal-agent relationship or employer-employee relationship is contemplated or created by the parties to this contract. The Vendor as an independent contractor is solely liable for the acts and omissions of its employees and agents.

The Vendor shall be responsible for selecting, supervising and compensating any and all individuals employed pursuant to the terms of this EOI and resulting contract. Neither the Vendor nor any employees or contractors of the vendor shall be deemed to be employees of the State for any purposes whatsoever.

The Vendor shall be exclusively responsible for payment of employees and contractors for all wages and salaries, taxes, withholding payments, penalties, fees, fringe benefits, professional liability insurance premiums, contributions to insurance and pension or other deferred compensation plans, including but not limited to Workers' Compensation and Social Security obligations, and licensing fees, etc. and the filing of all necessary documents, forms and returns pertinent to all of the foregoing.

The Vendor shall hold harmless the State, and shall provide the State, SAMB and its Project Manager with a defense against any and all claims including but not limited to the foregoing payments, withholdings, contributions, taxes, social security taxes and employer income tax returns.

The Vendor shall not assign, convey, transfer or delegate any of its responsibilities and obligations under this contract to any person, corporation, partnership, association or entity without expressed written consent of the SAMB.

3.3.5 INDEMNIFICATION

The Vendor agrees to indemnify, defend and hold harmless the State, SAMB and its Project Manager, their officers, and employees from and against: (1) Any claims or losses for services rendered by any subcontractor, person or firm performing or supplying services, materials or supplies in connection with the performance of the contract; (2) Any claims or losses resulting to any person or entity injured or damaged by the Vendor, its officers, employees, or subcontractors by the publication, translation, reproduction, delivery, performance, use or disposition of any data used under the contract in a manner not authorized by the contract, or by federal or state statutes or regulations; (3) Any failure of the Vendor, its officers, employees or subcontractors to observe state and federal laws, including but not limited to labor and wage laws.

3.3.6 CONTRACT PROVISIONS

After the most qualified Vendor is identified, and fee negotiations are concluded, a formal contract document will be executed between the State and the Vendor. In addition, the EOI and the Vendor's response will be included as part of the contract by reference. The order of precedence is the Contract, the EOI and the Vendor's response to the EOI.

3.3.7 GOVERNING LAW

This contract shall be governed by the laws of the State of West Virginia. The Vendor further agrees to comply with the Civil Rights Act of 1964 and all other applicable laws (federal, state or local government) and regulations.

3.3.8 COMPLIANCE WITH LAWS AND REGULATIONS

The Vendor shall procure all necessary permits and licenses to comply with all applicable laws, federal, state or municipal, along with all regulations, and ordinances of any regulating body.

The Vendor shall pay any applicable sales, use, or personal property taxes arising out of this contract and the transactions contemplated thereby. Any other taxes levied upon this contract, the transaction, or the equipment, or services delivered pursuant hereto shall be borne by the contractor. It is clearly understood that the State of West Virginia is exempt from any taxes regarding performance of the scope of work of this contract.

3.3.9 SUBCONTRACTS/JOINT VENTURES

The Vendor is solely responsible for all work performed under the contract and shall assume prime contractor responsibility for all services offered and products to be delivered under the terms of this contract. The State will consider the Vendor to be the sole point of contact with regard to all contractual matters. The Vendor may, with the prior written consent of the State, enter into written subcontracts for performance of work under this contract, however, the vendor is totally responsible for payment of all subcontractors.

3.3.10 TERM OF CONTRACT & RENEWALS

Contract approval and award will be in accordance with West Virginia Code Section 5G-1-1, et seq., and this EOI, particularly Section 4 hereof. This contract will be effective on the date set upon award, and shall extend for the period of one (1) year, at which time the contract may, upon mutual consent, be renewed. Such renewals are for a period of up to one (1) year, with a maximum of five (5) one year renewals, or until such reasonable time thereafter as is necessary to obtain a new contract. The "reasonable time" period shall not exceed twelve (12) months. During the "reasonable time" period the vendor may terminate the contract for any reason upon giving the SAMB ninety (90) days written notice. Notice by Vendor of intent to terminate will not relieve Vendor of the obligation to continue to provide services pursuant to the terms of the contract.

Any change in federal or state law, or court actions which constitute binding precedent in West Virginia, and which significantly alters the Vendor's required activities or any change in the availability of funds, shall be viewed as binding and shall warrant good faith renegotiation of the compensation paid to the Vendor by the SAMB and of such other provisions of the contract that are affected. If such renegotiation proves unsuccessful, the contract may be terminated by the State upon written notice to the Vendor at least thirty (30) days prior to termination of this contract.

3.3.11 NON-APPROPRIATION OF FUNDS

If the SAMB is not allotted funds in any succeeding fiscal year for the continued use of the service covered by this contract by the West Virginia Legislature, the State may terminate the contract at the end of the affected current fiscal period without further charge or penalty.

The State shall give the Vendor written notice of such non-allocation of funds as soon as possible after the SAMB receives notice. No penalty shall accrue to the SAMB or State in the event this provision is exercised.

3.3.12 CONTRACT TERMINATION

The State may terminate any contract resulting from this EOI immediately at any time the Vendor fails to carry out its responsibilities or to make substantial progress under the terms of this EOI and resulting contract. The State shall provide the Vendor with advance notice of performance conditions which are endangering the contract's continuation. If, after such notice, the Vendor fails to remedy the conditions contained in the notice, within the time period contained in the notice, the State shall issue the Vendor an order to cease and desist any and all work immediately. The State shall be obligated only for services rendered and accepted prior to the date of the notice of termination.

The contract may also be terminated upon mutual agreement of the parties with thirty (30) days prior written notice.

3.3.13 CHANGES

If changes to the original contract become necessary, a formal contract change order will be negotiated by the State, the SAMB and the Vendor, to address changes to the terms and conditions, costs of work included under the contract. An approved contract change order is defined as one approved by the Purchasing Division and approved as to form by the West Virginia Attorney General's Office, encumbered and placed in the U.S. Mail prior to the effective date of such amendment. An approved contract change order is required whenever the change affects the payment provision and/or the scope of the work. Such changes may be necessitated by new and amended federal and state regulations and requirements.

As soon as possible after receipt of a written change request from the SAMB, but in no event more than thirty (30) days thereafter, the Vendor shall determine if there is an impact on price with the change requested and provide the SAMB a written statement to identifying any price impact on the contract or to state that there is no impact. In the event that price will be impacted by the change, the Vendor shall, provide a description of the price increase or decrease involved in implementing the requested change.

NO CHANGE SHALL BE IMPLEMENTED BY THE VENDOR UNTIL SUCH TIME AS THE VENDOR RECEIVES AN APPROVED WRITTEN CHANGE ORDER FROM THE STATE.

3.3.14 INVOICES, PROGRESS PAYMENTS, & RETAINAGE

The Vendor shall submit invoices, in arrears, to the SAMB at the address on the face of the purchase order labeled "Invoice To" pursuant to the terms of the contract. Progress payments may be made at the option of the Agency on the basis of percentage of work

completed if so defined in the final contract. Any provision for progress payments must also include language for a minimum 10% retainage until the final deliverable is accepted.

If progress payments are permitted, Vendor is required to identify points in the work plan at which compensation would be appropriate. Progress reports must be submitted to the Agency with the invoice detailing progress completed or any deliverables identified. Payment will be made only upon approval of acceptable progress or deliverables as documented in the Vendor's report. Invoices may not be submitted more than once monthly and state law forbids payment of invoices prior to receipt of services.

3.3.15 LIQUIDATED DAMAGES: N/A

3.3.16 RECORD RETENTION (ACCESS & CONFIDENTIALITY)

Vendor shall comply with all applicable federal and State of West Virginia rules and regulations, and requirements governing the maintenance of documentation to verify any cost of services or commodities rendered under this contract by Vendor. The Vendor shall maintain such records a minimum of five (5) years and make available all records to Agency personnel at Vendor's location during normal business hours upon written request by the Agency within ten (10) days after receipt of the request.

Vendor shall have access to private and confidential data maintained by Agency to the extent required for Vendor to carry out the duties and responsibilities defined in this contract. Vendor agrees to maintain confidentiality and security of the data made available and shall indemnify and hold harmless the State and Agency against any and all claims brought by any party attributed to actions of breach of confidentiality by the Vendor, subcontractors, or individuals permitted access by Vendor.

3.4 SCOPE OF WORK

The Vendor shall furnish all labor, resources and materials required to develop and deliver digital orthoimagery and planimetric data for the State per the requirements specified.

3.4.1 PROJECT EXTENT

The project encompasses the entire land area of the State of West Virginia, or 24,078 square miles, more or less (Census 2000). The state boundary shall be buffered at a minimum of one thousand feet (1000'). Border areas of the state proximate to Virginia, Pennsylvania (along the Mason-Dixon line) and with Ohio (along the Ohio River), and Kentucky (along the Big Sandy and Tug Rivers), and Maryland (along the Potomac River and Mason-Dixon line) shall be buffered a minimum distance of 1000' or to the opposite river bank, whichever distance is greater. The entire coterminous land area of West Virginia shall be included in the program.

The lower resolution 400' design scale digital orthoimagery and planimetric data shall be developed over the predominantly rural areas of the state covering approximately 25,000 square miles. The **supplemental** higher resolution digital orthoimagery and planimetric data shall be developed over designated urban/suburban or other high priority areas of the state covering approximately 2,500 square miles. The Vendor has the sole responsibility to

determine the true extents of the various mapped areas at all scales with guidance from the State.

3.4.2 PERFORMANCE CRITERIA/ PRODUCT SPECIFICATIONS

The performance criteria / product specifications listed below, define the quality of the product that is required for the SAMB and its capability to support additional (post project) data development by third party vendors. The digital ortho-product is defined here, in terms of traditional photogrammetric processing terminology and specifications. However, ultimately, the final quality of the resultant product, not the processing method, for the purposes of creating an accurate, complete and up-to-date road centerline file and addressing points for the State of West Virginia is the ultimate focus of this EOI. Vendors are encouraged to submit innovative proposals using the latest proven technologies with which they are experienced that will conform to project requirements and produce the intended outcome.

[Instructions to Vendors: The criteria for Vendor's technical proficiency score are set forth in subsection 4.2.2.8. In responding to the technical specifications below, Vendors must specify not only that they will comply, but also clearly articulate their respective specific plans for compliance. Under each subsection for technical criteria below, responses must, in addition to indicating compliance with each technical specification, provide a written statement demonstrating Vendor's ability to meet the technical specifications, including the quality, effectiveness and expertise of equipment, personnel and other resources the Vendor is offering. In addition to such a written statement under subsection 3.5.4 "Project Management, Control and Deliverables," the Vendor shall, under that subsection, fully articulate Vendor's understanding of the scope of SAMB's overall purpose and demonstrate how Vendor will produce a product that will fully integrate into the Board's overall mapping and addressing system (reference also Request for Proposal, EOI # SAM0201, attached hereto). Scores will be based on the quality of the substance of Vendor's written demonstrations, as well as the interview/oral presentation provided for below.]

3.5 TECHNICAL PERFORMANCE CRITERIA

The following specifications and performance criteria are intended to be the minimum required to meet the project objectives. Variations in individual elements of the performance criteria will be considered. However, proposals that include alternative methodologies must conclusively demonstrate that the resulting product will meet or exceed the product quality defined by SAMB using the performance criteria or product specifications listed in this section. All proposals must clearly indicate how each performance criteria / product specification is met or compensated for using alternative methodologies.

The Vendor shall, if necessary, propose alternative processing strategies, image quality specifications, or acceptance standards for digital imagery. State reserves the right to agree to or modify any Vendor-proposed standard prior to commencement of work.

3.5.1 TECHNICAL IMAGERY AND RELATED SPECIFICATIONS

3.5.1.1 Horizontal Accuracy Requirements

The imagery collected for this project shall support the development of digital base mapping that meets or exceeds the **horizontal** accuracy requirement for Class 1 mapping standards in conformance with *ASPRS Accuracy Standards for Large-scale Maps, Class 1 (1990)* at the **specified equivalent map scales** except for any deviations specified in this document.

For the purposes of this EOI, horizontal map accuracy is defined as the root mean square (RMS) error in terms of the project's planimetric survey coordinates (X,Y) for checked points as determined at full (ground) scale of the map. The RMS error is the cumulative result of all errors including those introduced by the processes of ground control surveys, map compilation and final extraction of ground dimensions from the map. The limiting RMS errors established by this standard are the maximum permissible RMS errors for 90% of the check points on a map. These limits of accuracy apply to tests made on well-defined points.

Scale: 1:4,800 (1"=400') ASPRS, Class 1

Limiting RMS for E (X) coordinates = 4.0' = 2*GSD

Limiting RMS for N (Y) coordinates = 4.0'

Optional Scale: 1:1,200 (1"=100') ASPRS Class 1

Limiting RMS for E (X) coordinates = 1.0' = 2*GSD

Limiting RMS for N (Y) coordinates = 1.0'

Accuracy will be reported according to the Federal Geographic Data Committee (FGDC) Geospatial Positioning Accuracy Standards, Part 3: National Standard for Spatial Data Accuracy [NSSDA] (1998).

Circular RMS error:

Circular Root Mean Square Error ($RMSE_r$) = $1.4142 * 2 * GSD$ in Easting = $1.4142 * 2 * GSD$ in Northing

= 5.657' at 400' design scale

= 1.414' at 100' design scale

Absolute accuracy according to NSSDA testing:

NSSDA accuracy (20+ points) such that $1.73 * \text{Circular RMSE} < 9.8'$ at 400' design scale

NSSDA accuracy (20+ points) such that $1.73 * \text{Circular RMSE} < 2.4'$ at 100' design scale

[Note: Vertical accuracy is specified within the Digital Terrain Model (DTM) section of this EOI.]

3.5.1.2 Aerial Imagery

All imagery collected shall conform to the ASPRS Draft Aerial Photography Standards (1995) unless otherwise specified herein.

1. Vendors shall develop a proposed flight plan and otherwise describe in their proposal how the imagery will be captured, including:
 - a. Type of aerial camera, including detailed specifications
 - b. Film type, if used
 - c. Intended flying height
 - d. Focal length
 - e. Intended scan resolution
 - f. Forward lap, side lap, allowable tip, allowable tilt, allowable crab of imagery
2. The camera system shall have the resolving power Average Weighted Area Resolution (AWAR) of at least 90 lines/mm.
3. Flight directions shall preferably be in cardinal directions and orthogonal (either North/South or East/West). It is preferred to include cross flights to tie the ends of flightlines together.
4. Only late-winter/early-spring flying shall be accepted.
5. The Vendor shall prioritize the acquisition of West Virginia imagery and preferably have more than one aircraft standing by (and in their immediate control) for the limited number of days usually acceptable to capture imagery. Vendors shall indicate whether they intend to have aircraft on-site within West Virginia available during clear weather conditions and for what duration aircraft will remain on-site.
6. The SAMB understands that 100' design scale mapping usually occurs before surrounding 400' design scale maps are produced (higher resolution maps should be used to control and connect the lower resolution features). In this project, it may be necessary to contract for some 100' design scale maps after the 400' design scale maps are produced. Where reasonable to do so, the 400' design scale photography should continue through the 100' design scale areas to minimize edge effects during the aerotriangulation process and to facilitate controlling the later 100' design scale mapping.

3.5.1.3 Imagery Type: Natural True Color (24 bit)

Photography or digital imagery shall be the equivalent of natural true color, minimum 24-bit, to include 256 levels of value for each color band (Red, Green, Blue), with 0=black, 255=white. The highest natural color film resolution available or equivalent sensor shall be used.

3.5.1.4 Temporal Requirements

All imagery shall be collected during the Late Winter / Early Spring calendar year 2003 flying season (approximately mid-February to mid-April) during maximum leaf-off conditions for deciduous vegetation in West Virginia. The sun angle shall be 30 degrees or greater unless otherwise negotiated. To the extent possible, no clouds, snow, fog, haze, smoke, or other ground obscuring conditions shall be present at the time of the flights. In the eastern highlands of the state, where there are several ski resorts and natural snow cover can persist through April, final criteria for allowable snow cover and leaf-on conditions will be determined at the Project Initiation meeting. The Vendor is encouraged to offer alternative solutions to counter the potential snow cover problem. Initial film or image processing shall remove the systematic effects of vignetting, lens fall-off, and filtering and shall use the best available dodging techniques to do so.

The State reserves the right to reject and have the Vendor redo any or all photography or imagery pertaining to problems including but not limited to, coverage, overlap & sidelap, Airborne Global Positioning System (ABGPS), quality, resolution, low sun angle, tone or contrast, or artifacts, etc., at no extra cost to the State unless the Vendor and the State had previously agreed in writing that a given condition is allowed.

3.5.1.5 Tile Size by Resolution/Scale

The Vendor shall propose the most appropriate scale or equivalent Ground Sampling Distance (GSD), flying height and number of tiles to accomplish each of the following requirements.

STATEWIDE:

Design or equivalent map scale: 1:4,800 (1"=400');

Medium pixel resolution: 2-foot GSD*;

Tile grid size: 10,000' x 10,000';

Maximum flying height shall be 14,400 feet above terrain if 6" focal length camera is used.

SUPPLEMENTAL URBANIZED AREAS:

Design or equivalent map scale: 1:1,200 (1"=100');

High resolution pixel resolution: 0.5-foot GSD*;

Tile grid size: 2,500' x 2,500';

Maximum flying height shall be 3,600 feet above terrain if 6" focal length camera is used.

[Vendors may offer alternative configurations that meet or exceed the above minimum requirements.]

3.5.1.6 *Extent and distribution of imagery*

Using the master index map concept, the Vendor shall submit planned flight lines depicting approximate exposure centers to the State for review prior to ground control surveys and at least thirty (30) days prior to scheduled image capture. The backdrop as a minimum should depict state, county, and metro area boundaries with names and the major transportation and hydrographic features. A USGS 1:100,000 scale topographic map base is also acceptable.

The Vendor shall describe the optimal estimated distribution and geographic extents for 2-foot GSD and optional 0.5-foot GSD digital orthoimagery. The exact extents and distribution of tiles for each resolution of imagery, will be finalized in consultation with the Board and the SAMB Project Manager during contract negotiations.

The following criteria shall apply:

Mandatory standard mapping: 2-foot GSD: 2-foot GSD orthoimagery shall be collected for the entire co-terminus extent of the State of West Virginia (25,000 square miles, more or less, including minimum buffers along border areas).

[Instructions to Vendor: Use Attachment A to describe standard and optional tasks for 400' design scale mapping statewide.]

Additional 100' design scale areas of 0.5-foot GSD.

Case 1, supplemental urbanized areas having defined mapping extents. These areas are likely to be included as part of the initial contract, scheduled to start in the 2003 spring flying season. Initial coverage at 100' design scale to include the following most populous or high-growth potential counties, divided into these logical project areas:

1. Kanawha Valley: Wayne (north half), Cabell, Putnam, Kanawha*
2. I-77/64 Corridor: Fayette, Raleigh*, Mercer
3. I-79 Corridor: Monongalia, Marion, Harrison
4. Northern Panhandle: Hancock, Brooke, Ohio, Marshall
5. Eastern Panhandle: Berkeley*, Jefferson*, Morgan, Mineral (Cumberland MSA vicinity)
6. Wood County

An asterisk (*) indicates those counties that have acquired aerial photography of recent vintage (two years or less) that the selected vendor in cooperation with the SAMB Project Manager should evaluate for its utility and incorporation into the proposed scope of work before flying commences in Spring 2003. If data from any of these areas are deemed suitable for inclusion, the work associated with the conversion, enhancement and upgrading of these data into deliverables consistent with those specified herein shall be described and otherwise included as part of negotiations

The initial estimation of the extent and distribution of 0.5-foot GSD coverage (defined Supplemental Areas 1-6) were approximated using the Bureau of Census Metropolitan Statistical Area (MSA), Urbanized Areas (UA) and Incorporated Places designations for West Virginia as determined by the 2000 Census. These areas were compiled by the SAMB Project Manager to create a preliminary grid coverage map for the state (see Attachment D). The Vendors shall use the included grid map as a guide to determine the extents of statewide 400' design scale and supplemental 100' design scale in their respective proposals. Reference maps and coverages of the Census data as well as the prepared grid map will be made available for ftp download electronically from the WV GIS Technical Center website. <ftp://ftp.wvgis.wvu.edu/wvsamb/eoi-sam0202/maps>. The final extents and distribution of each imagery resolution for this project will be determined during contract negotiations. The index map is currently undergoing review by the counties listed above and may be revised.

[Instructions to Vendors: Use Attachment B to prepare standard and optional tasks for each of the six pre-defined supplemental mapping areas at 100' design scale.]

Case 2, areas having currently undefined mapping extent. These areas are NOT likely to be included as part of the initial contract but may be activated during 2003 or in subsequent project years as interest and funding allows. The SAMB or individual counties may choose to contract these areas separately as well. For estimating purposes, additional **optional** mapping at 0.5-foot GSD orthoimagery may eventually include the following whole counties or portions thereof, divided into these rational project areas:

1. McDowell, Wyoming
2. Mingo, Logan, Boone
3. Other incorporated areas and county seats not already acquired
4. State Parks and Forests, Significant Physical Features (i.e., New River Gorge), or Cultural or Historic significance (i.e., Moundsville, etc.)
5. Other areas of special significance (mining sites, flood plains, etc.)

It is anticipated that some counties and municipalities, in conjunction with other stakeholder groups (for example FEMA, County Commissions, Public Service Districts [PSDs], etc.) may request, through SAMB, to add additional areas. For these undefined mapping extent areas, the vendor shall be asked to negotiate per square mile estimates including volume discounting based on extent mapped for these types of areas. Unless otherwise negotiated, fees shall remain fixed for a period of 18 months following the end of the initial contract.

[Instructions to Vendor: Use Attachment C to prepare estimates for standard and optional tasks for undefined mapping extent areas at 100' design scale. The Vendor should be prepared to discuss per square mile cost estimates during negotiations. DO NOT include cost estimates in this section.]

3.5.1.7 Orientation and Units

Imagery for the project will be referenced to the North American Datum of 1983 (NAD 83) horizontal datum using the latest adjustment and the North American Vertical Datum of

1988 (NAVD 88) vertical datum. The National Geodetic Survey (NGS) GRFP 99 model shall be used in the derivation of orthometric heights. Imagery shall be oriented to the West Virginia State Plane North and South zones using U.S. Survey Feet.

3.5.1.8 Camera and Focal Length

Cameras or digital sensors shall account for Forward Motion Compensation (FMC). A six-inch focal length camera shall be the nominal requirement. If a 12-inch focal length camera is used, alternative flying heights may be acceptable as long as other requirements can be met. Other sensor types and configurations may be used subject to the Vendor's meeting all relevant and equivalent specifications.

3.5.1.9 Overlap

Imagery shall be near vertical and adhere to the minimum forward and sidelaps as specified within the ASPRS standard. The Vendor is cautioned that the State expects the aerial team shall meet these minimums in spite of large fluctuations in elevation so the aerotriangulation process remains solid.

3.5.1.10 Airborne Global Positioning System (ABGPS)

ABGPS flight navigation system shall be used to accomplish pinpoint color aerial photography on predetermined camera exposure stations resulting in a regular spatial grid format. Vendors shall propose their approach for ABGPS solution.

The accuracy of existing ground reference stations for use with Airborne GPS shall be within 2-centimeters or better as defined in the *FGDC-STD-007.2-1998, Geospatial Positioning Accuracy Standards Part 2: Standards for Geodetic Networks*. Existing control from the National Spatial Reference System (NSRS) database, which meets the FGCS document *Geometric Geodetic Accuracy Standards Specifications For Using GPS Relative Positioning Techniques* (1989), can be used if it is of Second Order, Class I.

Camera exposure station coordinates shall be determined from ABGPS techniques. Two Global Positioning System (GPS) ground reference stations shall be preferred. At least one of these stations shall be in the project aerotriangulation block area.

Standard deviations of GPS coordinates at the exposure stations based on the post processing of the raw AGBPS positions against two or more base stations in both the forward and backward directions shall average to be less than 10 cm. Additionally 95% of the centers shall have deviations under 15 cm and 99% of them shall be less than 20 cm.

Currently only one Continuous Operation Reference Stations (CORS) operates in Beckley, WV (http://www.ngs.noaa.gov/CORS/WVirginia/wvirginia_bkly.html)

3.5.1.11 Alternate Sensor Capabilities

SAMB will consider the use of compatible digital cameras or multispectral sensors that are demonstrated to be able to produce imagery that meets or exceeds the performance criteria of this solicitation. Regardless of the image capture technology used, the quality of the final orthoimagery product, as specified herein, must be achieved. The Vendor shall describe any proposed alternative technologies and the anticipated risks and benefits to the project. Self

calibration and in-situ calibrations may be accepted in lieu of USGS camera calibration for sensors other than analog mapping cameras. Prior calibration data shall be submitted for any non-traditional imaging sensors. The Vendor shall also plan to discuss any associated differences in costs using proposed alternative technologies during the Vendor negotiations. ***[However DO NOT include any cost or pricing information in this section. Costs will only be considered during the negotiation phase with the successful vendor].***

3.5.2 PROJECT CONTROL AND ORIENTATION

3.5.2.1 Project Control

All ground control for the project must be tied to the West Virginia High Accuracy Reference Network (West Virginia HARN 2000) and must be established by a professional licensed to practice land surveying in the State of West Virginia.

Any control established for use in the project shall be secured in accordance with the National Geodetic Survey (NGS) standards and all coordinates and data should be of acceptable quality to meet Second Order, Class I specifications unless otherwise specified herein.

The vertical control shall, at a minimum, shall be surveyed to meet the Third Order vertical accuracy specifications in NAVD 88 datum unless otherwise specified herein.

Horizontal accuracy: Expected combined local and network accuracy at 95% confidence of less than or equal to five (5) centimeters (approximately 0.20 feet) as determined by the residuals of the network adjustment.

Vertical accuracy: Expected combined local and network accuracy at 95% confidence of less than or equal to five (5) centimeters (approximately 0.20 feet) as determined by the residuals of the network adjustment.

3.5.2.2 Ground Control Requirements

The Vendor shall describe in detail how horizontal and vertical ground control will be established, and how the imagery will be referenced to both horizontal and vertical ground control. The Vendor shall be prepared to discuss which control survey specifications or standards may be too cost prohibitive, and if so shall suggest alternative standards during negotiations. ***DO NOT include any cost information in this section.*** The SAMB shall have sole discretion to approve alternative approaches to the survey.

3.5.2.3 Procedures

1. The Vendor shall be responsible for establishing a ground control plan of sufficient density and accuracy to perform the required orthophoto mapping (and if selected, optional contouring) at the required accuracies.
2. The Vendor shall determine whether or not to panel the control points such that the specified accuracies can be met. Paneling is recommended.
3. A minimum of one (1) control point shall be located at the corners and major indentations and inflection points of each block solution. In cases where there are large bodies of water

- (lakes and rivers) that define the block boundaries, additional control shall be located along the hydrographic features to stabilize the block geometry.
4. The existing CORS stations and other conforming NGS approved stations shall be used to constrain the network adjustment.
 5. All coordinates and residuals shall be reported in latitude, longitude and ellipsoidal height and *using the specified datum and projection coordinates and units of measure*.
 6. The Vendor shall provide written documentation that the published coordinates for monumented points used to constrain the network are based upon GPS-derived observations adjusted to the existing CORS.
 7. Surveys to establish these horizontal control points shall use differential, dual-frequency Global Positioning System (GPS) receivers.
 8. Any additional required vertical control shall be derived from GPS surveys using the specified geoid to determine orthometric heights in the specified unit of measure.
 9. Offsets to horizontal points shall not be allowed. Aerotriangulation control points shall normally be placed at the elevation of the surface DTM so they can be used to QA the DTM and resultant orthorectified maps.
 10. Ground control shall be required for verification and QA, regardless of the orientation sensors available on board the aerial platform used for capture of the digital imagery.
 11. In addition to surveying the needed photo control points required for aerotriangulation, and at the Vendor's expense, a minimum of 25 additional, blind, *aerotriangulation (AT)* QA points shall be established and measured in the office and field overall per 400' equivalent scale AT block with at least 6 well-distributed QA points per 100' equivalent scale aerotriangulation block. These points shall be selected for the Vendor's survey team by the project manager and vendor photogrammetrist and approved by the State.
 12. AT QA points generally shall be placed **at ground level (also to be used to check the DTM)**, be visible on the photography and resultant orthophotos and be located within stereo models along the edge of each block (generally at the corners) and at least 500 feet from other control points. No offsets to poles or other features are allowed. The GPS coordinate values for these blind QA points shall be delivered **only** to the State and not to the aerotriangulation team. *The survey professional shall sign and certify in writing that the production staff did not and shall not have access to the coordinates of QA points for any reason.*
 13. In addition to surveying the needed photo control points and blind QA points required for aerotriangulation, the Vendor shall have the surveyor provide a minimum of 20 additional, blind, photo-identifiable *orthorectification* QA points which shall be established and measured in the field *for each tile delivery lot*. These points shall be interspersed throughout the delivery area away from the QA points used for aerotriangulation. The general layout shall be shown on the master index map for approval by the State. The coordinate values for these blind QA points shall be delivered **only** to the State. ***The survey professional shall***

sign and certify in writing that the production staff did not and shall not have access to the coordinates of orthorectification QA points for any reason.

3.5.2.4 Processing

1. All GPS surveys shall be performed using post-processed static differential survey techniques.
2. The network or sub-network for each survey shall consist solely of independent, non-trivial baselines. Cross-ties shall be used between stations whenever 10 legs observation lines separate stations or the geometry of the network is such that isolated sub-nets exist.
3. At least half the stations shall have two independent measurements.
4. Only processed baselines that have fixed ambiguity resolutions shall be included in the network.

3.5.3 PHOTOGRAMMETRIC PROCESSING

All processing shall be performed in the softcopy environment.

3.5.3.1 Scanning

If film is scanned, the Vendor shall scan using an aperture (pixel size) that is no finer than the effective resolving power of the combined film and lens system. For an 80 line pairs per millimeter color infrared film, the minimum resolving power is 1/80 mm or 0.0125 mm (12.5 microns). Scan resolution shall not exceed 20 microns for aerotriangulation solution.

Where a film-based camera is proposed, image scanning shall be performed directly from the original color aerial film. The same imagery shall be used both for performing aerotriangulation as well as processing for DTMs, compilation and orthophotography.

Scans shall be produced such that the orthorectified imagery can meet the stated specifications for uniform color, tone, contrast and clarity. Any negative systematic effects of exposing, processing and scanning shall be eliminated in the resultant digital files prior to orthorectification. Even if the color balance and contrast of the scanned images are deemed acceptable, the final color and contrast of the orthorectified files may need to be further enhanced and balanced.

3.5.3.2 Analytical Aerial Triangulation

Combined AGPS supported automatic aerotriangulation with all sensors data shall be carried out for photo control point densification using Least Square Matching (LSM) techniques at a minimum. Large blocks shall be formed as far as possible. The main consideration for block size shall be the efficiency of data processing and management.

The aerotriangulation accuracy measures shall be:

1. **Accuracy of image observations $\sigma_0 \leq 6 \mu m$ [Over 6 microns is subject to review.]**
2. **RMSE in height at check points: 1/10,000 of flying height is required.**

400' design scale; RMSE = 1.44'

100' design scale; RMSE = 0.36'

3. RMSE in E and N at check points: 1/10,000 of the flying height.

400' design scale; RMSE = 1.44'

100' design scale; RMSE = 0.36'

4. μ_x and $\mu_y < 6 \mu\text{m}$ as RMS residuals at the image points.

Aerotriangulation Processing and QA Measurement Requirements:

1. It is highly recommended to use cross flights at the ends of flightlines.
2. The Vendor shall describe the photogrammetric equipment, software, and procedures to be used to accomplish the orientation.
3. The camera or sensor shall use airborne positioning (ABGPS) and may use as necessary angular orientation devices (IMU) to reduce the necessity for extensive ground control.
4. Analytical aerotriangulation using a rigorous bundle block adjustment shall be required if an IMU is not used.
5. Any alternative proposed process to orient imagery to ground control shall be described in detail, including how the alternative process will allow the required accuracies for the delivered orthoimagery to be met.
6. The State shall direct the Vendor to select, document and survey 25 overall or at least 10 blind QA points per aerotriangulation block. The Vendor's survey team shall provide the State, and not the aerotriangulation or production staff, reduced coordinates for these points in spreadsheet format.
7. The QA point field coordinates shall be checked against the aerotriangulated values using NSSDA procedures.
8. Performance criteria is for NSSDA analysis [of 20+ QA points] is for QA points to be within 1.73 RMSE for appropriate scale.
9. The aerotriangulation solution shall be able to output theoretical accuracy of the block adjustment.

3.5.3.3 *Planimetric Vector Compilation*

Limited compilation of planimetric features shall be compiled in stereo to assist the addressing process. These and other map features will be used for developing and maintaining structure addressing, road inventories, designation of emergency service zones (ESZ), Master Street Address Guide (MSAG) & Address Inventory databases, etc. The Vendor shall not be responsible for assigning proper names to identified features.

3.5.3.3.1. *Planimetric Transportation Features (3D)*

Road Centerlines

- *Lines:* This feature shall represent the following road types: interstate, US, state, county, township, and city roads and streets. This feature should also include all exit/entrance ramps, connectors and other methods of egress for limited highway systems.
- Each category of road shall have its own feature type (e.g., Spatial Data Standards for Facilities, Infrastructure and Environment [SDSFIE] entity set, or other equivalent). Information on the SDSFIE can be found at: <http://tsc.wes.army.mil/products/TSSDS-TSFMS/tssds/html/>
- It is preferred, but not required, to stereo digitize transportation features in a consistent direction, i.e., from south to north and from west to east.

Railroad Centerlines

- *Lines:* This feature shall represent all active railroad lines. Abandoned railroad right-of-way and those lines converted to rail-trails shall be identified where possible.
- Each category of rail line shall have its own feature type (e.g., SDSFIE entity set, or other equivalent).

Driveway Centerlines

- *Lines:* This feature shall represent all driveways over 200' in length, driveways leading to two or more addressable or habitable structures, and all "tertiary" roads such as forestry & game land roads, logging roads, utility line roads, mining roads, etc.

Overpasses, Bridges and Tunnels or Ferry Routes

- This feature shall represent all tunnels, bridges and overpasses or ferry routes as 3D closed *polygons*. Multi-level bridges shall each be represented as unique features, one for each level. Railroad tunnels, culverts, trestles and bridges shall be so designated.
- Transportation centerlines shall be continuous when they cross bridges or enter tunnels.

Naming of Features. Above Feature types shall not be named.

3.5.3.3.2. *Planimetric Structures*

- *3D Centroids:* This feature shall represent the stereo compiler's best effort to recognize and digitize any and all individual "habitable" or "addressable" structures (such as houses, trailers and mobile homes, garages, barns and sheds, office

buildings, schools, churches, social halls, sports arenas, stores, hospitals, etc.) **where individuals may reside or gather for business, meetings, entertainment, recreation, religion, or any other social events.** Both single and multi-addressable 'habitable' or 'addressable' structures shall be assigned centroids. No field validation is expected or necessary by the photogrammetrist. However, for the purpose of having the State later estimate the number of occupied floors in multi-addressable structures, building centroid elevations shall be determined. (This is accomplished by placing the floating dot at the level of the higher set of eaves of the structure or at the highest roofline that appears to be at ceiling level of the top floor (not the peak of the roof). After obtaining an intelligent elevation, slide the centroid horizontally such that it is in the building near the center.)

- *Polygons*: Larger and readily identifiable multi-addressable structures such as apartment buildings, shopping malls, industrial complexes, military sites, etc., shall have the footprints stereo digitized as well as having a 3D centroid placed within the bounds of the structure.
- Structure Features shall not be assigned names.

3.5.3.3.3. *Planimetric Hydrographic Features*

Hydrographic Features

- This feature shall represent all bodies of water such as lakes, reservoirs, ponds, rivers, streams, etc.
- Each category of feature shall have its own unique feature type (e.g., SDSFIE entity set, or other equivalent).
- Streams and Rivers shall be represented as 3D *lines*. Only streams with visible water shall be collected. Streams shall be single line up to 10 feet wide for 100 scale, or 50 feet wide for 400 scale. Double lines, representing left and right bank, shall be collected where those dimensions are exceeded.
- Lakes and Ponds as *polygons*. Lakes and ponds shall not be differentiated. Only lakes and ponds with visible water shall be collected. The minimum dimension for collection shall be 100 feet in length or width. Lakes and ponds shall be level and shall be considered exclusion areas in the Digital Terrain Model (DTM) processing.
- Swamps and Marshes as *polygons*. Swamps and marshes shall be considered the same feature class and shall not be further be differentiated. Only clearly identifiable swamps and marshes shall be collected. The minimum dimension for collection is 1000 feet in length or width.
- Intermittent features (water not present at time of photo) shall not be collected.
- No flow direction will be required, but consistent digitizing in one direction (e.g., upstream) is preferred. In any case, the breaklines will be in 3D so flow direction may be inferred.

- No hydrographic feature names or reach codes shall be required.
- Lines shall have single coordinate triplets where they meet and shall not have undershoots or overshoots where the lines normally come together.
- All hydrographic features shall be collected at the visible land-water interface.
- Edgematch within and between production blocks shall be required.
- Hydrographic features in the DTM, when overlaid on the final orthophoto, shall appear within 3 pixels of the same feature on the orthophoto with 90% confidence.
- Hydro lines shall be continuous (if the feature is continuous, visible and identifiable), but not edited for topological integrity or connectivity. Lines shall be continuous (elevation estimated) when passing under bridges.
- Elevation values shall be within the vertical accuracy specification for the respective scale.

Dams and Spillways

- Dams and Spillways, shall be defined as points or polygons to the extent they are visible and identifiable. Other critical features such locks, canals, etc. shall be identified also.
- Each category of feature shall have its own unique feature type (e.g., SDSFIE entity set, or other equivalent). No names of features shall be assigned.

3.5.3.3.4. General Planimetric Features Delivery Specifications

- All planimetric features shall be delivered in ESRI shapefile and associated .dbf attribution tables compiled as necessary to deliver these planimetric features per 50,000' x 50,000' tile set. Partial tiles containing planimetric data are acceptable. The Vendor shall avoid creating artificial nodes between stereomodels and the smaller tile boundaries. The Vendor will be required to identify unique feature subclasses in transportation, hydrography, and structures. An example of the classification that may be required is the Spatial Data Standards for Facilities Infrastructure and Environment (SDSFIE) for transportation, hydrography, and buildings entity sets. Final feature class designations will be proposed by the Vendor and shall be approved by the State.
- A second set of transportation centerline features shall also be delivered in a MicroStation .dgn format using the current West Virginia Department of Transportation (WVDOT) CADD Standards. These standards have been incorporated into a MicroStation macro that will place drawing data onto the proper level, with the established line weight, color, style, text sizes, and so on using the WVDOT Resource Files. Inconsistencies between these specifications and the WVDOT standards shall be discussed and resolved in the vendor's response. The WVDOT CADD Standards can be found at:

http://www.wvdot.com/9_consultants/9b_designaids.htm

- Each feature shall be collected with its own unique code to facilitate translations and topological processing. Transportation data shall be processed and edited such that topology builds error-free.
- The 3D elevations associated with the transportation and hydrographic features shall be used to improve the DTM surface. The transportation and hydrographic features shall be placed as coded breaklines within the ASCII text file used to deliver the DTM files as well as being used and delivered in ESRI shapefile format.
- The largest available scale of imagery shall be used to collect all planimetric and elevation features.
- The Vendor shall edit the transportation features for topological integrity and connectivity. Polygon features shall be closed. There shall be 100% coordinate and logical edge matching between and within tiles. Roads shall be broken at true intersections. Overpasses and underpasses shall not break.
- All dangling and pseudo nodes shall be checked for validity. Invalid dangling and pseudo nodes shall be eliminated.
- Digital features shall not extend beyond the neat line of each modular tile as defined in the digital planimetric mapping specifications.
- Line and polygon features shall appear smooth when plotted at the respective design scales.
- Planimetric features shall adhere to the same horizontal and vertical accuracy specifications as the orthophoto products.
- Vendor shall include a QC process that inspects the compilation process for completeness and accuracy and deliver the completed QC forms to the State.

Vendors shall otherwise propose all necessary procedures needed to develop and deliver a digital map base that will assist addressing contractors to graphically locate the source of a 911 call.

3.5.3.3.5. Planimetric performance criteria

Transportation: 99% of identifiable transportation features shall be properly collected.

Structures: 90% of identifiable addressable structures shall be properly collected.

Hydrography: 95% of identifiable hydrographic features shall be properly collected.

Where no size criteria is listed, the maximum allowable omissions are 1/4" at map scale in length and/or width.

3.5.3.4 Orthophoto Rectification, Mosaicking and Processing

3.5.3.4.1. Rectification

1. To minimize vertical distortion of above ground features, orthorectification shall be restricted primarily to neat model areas, using the centers of each model rather than every other model.
2. Overpasses/bridges along roadways shall retain correct horizontal location and geometry. Features (especially roads under the overpass) that approach the underside of the overpass/bridge shall be rectified to their correct ground locations. The practice of assuming the DTM under and around the elevated overpass is at the same elevation as the overpass for purposes of orthorectification is unacceptable. Some smears will be allowed where the TIN surface is near vertical between the overpass/bridge and the ground beneath and imagery is missing due to the perspective view. These smears shall be patched from similar nearby imagery whenever practical to do so.
3. Smears shall generally be removed except in situations pre-approved by the State.
4. Cubic convolution sampling shall be used unless otherwise approved by State.

3.5.3.4.2. Radiometric Performance Criteria

The digital orthoimagery within each state plane coordinate zone shall be generally seamless. The imagery will be geometrically and radiometrically correct and match seamlessly without noticeable differences. Ortho-rectification and mosaicking shall result in producing ortho imagery having sharp uniform balanced color contrast, and containing minimum scratches, artifacts, or dust, consistently across the database.

Radiometry acceptance criteria shall be determined jointly through consultations between the Vendor and the SAMB Project Manager by processing small prototype signature areas. These sample areas shall be submitted to the SAMB Project Manager for review. Once the optimal characteristics have been approved by the SAMB Project Manager, all other images shall have their contrast and brightness values adjusted to that of the prototype signatures. The goal is to produce digital imagery of near consistent tone and contrast throughout the state, as well as within single images.

The Vendor shall ensure imagery is quality controlled at all stages and be, edge matched, free from double image 'ghosting' effect at the mosaicking edges, and sharp without blurring effect.

3.5.3.4.3. Radiometry

The difference in average pixel values on either side of a mosaic seamline shall not exceed 70 density units, when measured on a homogeneous surface with similar characteristics (water surfaces are exempt from this requirement). Greater differences may be allowed, upon approval by the SAMB Project Manager, if the correction will cause significant degradation of the image content on either side.

Blemishes, scratches and dust performance criteria: These artifacts, when viewed at the intended mapping scale, shall be generally acceptable within these limits:

If 1 pixel wide but less than 100 pixels in length.

If 2 pixels wide but less than 60 pixels in length.

If 3 pixels wide but less than 20 pixels in length.

If 4 - 8 pixels wide but less than 10 pixels in length.

Clusters of artifacts that do not individually meet these criteria shall be considered unacceptable if more than 10 are visible within a viewing screen at 1:1 zoom.

Artifacts exceeding these limits shall be acceptable if ground feature detail is not obscured, or if the brightness value of the pixels in the artifact is under 170. Otherwise they shall be removed.

3.5.3.4.4. Smears

Smears shall be corrected by adding mass points or breaklines to the delivered DEM as necessary to reflect actual terrain or by image processing where appropriate. Where DTM corrections or image processing will result in reduced horizontal accuracy or misrepresentation of the location or appearance of important features (structures, roads, etc.), the smear may remain untreated.

3.5.3.4.5. Mosaicking

1. Match lines shall be selected interactively. Match lines are only allowed where adjacent rectified images lie at the surface of the DTM used to create the orthoimages and are at the same elevation. . Limited exceptions may be allowed in heavy tree cover subject to prior review and approval from the SAMB Project Manager in advance of delivering these areas.
2. Mosaic lines shall not cross through buildings, bridges or other man-made structures not at ground level unless suspended or unavoidable. Join lines between overlapping images shall be interactively selected to minimize tonal variations and visible join lines.
3. 90% edge pixels along tested mosaic lines for well defined features to match within two GSDs. Remaining 10 percent to match within 3 pixels. Tiles shall be mosaicked so the images appear to be completely seamless when displayed or plotted at equivalent design scales.
4. There shall be no overlap or underlap or slivers of pixels either within or between tiles.
5. A majority of sun flares on water bodies shall be removed prior to delivery by inserting non-flared pixels of similar characteristics.
6. The images shall be edge matched so that tonal values are consistent across the edges and there is minimal evidence of the join. One or more reference images, approved in advance by the State, shall be used as reference.
7. There shall be minimal measurable radiometric seams within or between flightlines, stereomodels, or tiles. Deliverables shall include additional adjustment of radiometric values as necessary to accomplish tonal consistency across images.

8. Radiometric adjustment shall include color balancing, overall tone adjustment and brightness and contrast enhancements of the imagery over the entire project. Dark and light areas shall be evened out.
9. Where a 100' design scale tile meets a 400' design scale tile, maximum relative shift shall be equal to or less than five feet (5') on well defined ground features (roads, sidewalks, curbs) with an overall seven foot (7') maximum on all measurable features.

3.5.3.5 *Onboard Sensors*

The use of a digital camera, Inertial Measurement Unit (IMU) and other technology such as LIDAR is optional. Regardless of the methods or technologies used, the quality of the final product as specified in this Section must be achieved. The Vendor shall specify what alternative technologies are employed during image acquisition and/or post-processing.

3.5.3.6 *Digital Terrain Model (DTM)*

The Digital Terrain Model (DTM) developed for this project shall be of the quality required to support development of digital orthophotography at the parameters specified and meet a minimum vertical DTM accuracy. The DTM surface shall be delivered for acceptable use for future image orthorectification (possibly having different perspective centers) and 3D visualization.

3.5.3.6.1 *Vertical Accuracy Specification*

The elevation data collected for this project shall support the development of digital base mapping that meets a NSSDA **vertical** DTM accuracy standard sufficiently accurate to meeting the horizontal standards for orthorectification **and** creates a DTM with the following minimum accuracy. ASPRS vertical accuracy standards shall not be used.

1:4,800 (1"=400' design scale) areas:

DTM data expressed in TIN format shall further be compiled and then tested to meet a vertical accuracy standard of ten (10) feet at 95% confidence level consistent with NSSDA.

Optional 1:1,200 (1"=100' design scale) areas:

DTM data expressed in TIN format shall further be compiled and then tested to meet a vertical accuracy standard of four (4) feet at 95% confidence level consistent with NSSDA.

[According to NSSDA, accuracy at the 95% confidence level is defined to be equal to 1.96 times the RMS error as calculated by using test points to compare elevations interpolated from the delivered TIN with elevations derived from higher order surveys for the same horizontal positions.]

A DTM developed to support contour mapping is not within the scope of this EOI, but shall be considered as an option, and should be stated as an option in the Technical portions of the proposal.

3.5.3.6.2. *Elevation Data Specifications*

1. The planimetric features (transportation, hydrography) and additional breaklines (such as walls, ditches, ridges, valleys and other prominent visible ground surface features) shall be used to properly define the terrain.
2. Standing water bodies shall be level. Streams and rivers shall have breaklines along the water surfaces and along inflection points along the banks.
3. In order to avoid unnatural visual appearance of bridge decks, interstate overpasses, railroad trestles and similar features in the digital orthoimagery, edge of pavements at all levels shall be included as break lines with the elevation values associated with those features and included in the DTM.
4. DEM data shall have a vertical accuracy sufficient to meet the horizontal accuracy requirement to produce orthophoto maps and create elevation surfaces useful to portray 3D visualization surfaces, further specified below.
5. DTM data expressed in TIN format shall further be used and tested to meet a vertical accuracy stated previously. The State may rely on A/T passpoints and perhaps other field survey points to assess accuracy.
6. Whether photogrammetric compilation, LIDAR, IFSAR, or another sensor technology is used, elevation deliverables shall meet the same vertical accuracy specifications.
7. The Vendor shall deliver a continuous DEM surface with no disjoints, overlap or underlap between models or tiles.
8. The State acknowledges that NON-OPTIONAL, DTMs shall be collected only to meet orthorectification and 3D visualization accuracy and will not be trustworthy to be used for contour generation.

3.5.3.6.3. *Over-Edge*

The DTMs shall be compiled over-edge at least 1 inch at map scale beyond the neat boundary of the project area to eliminate edge effects.

3.5.3.6.4. *Elevation Data QA Process*

1. The Vendor shall otherwise indicate the process used to collect and QA elevation data.
2. Vendors shall use blind AT and ortho QA points to determine the integrity of the elevation surface.
3. Vendors shall later interpolate elevations from the derived TIN surface using the measured **horizontal** locations from the **AT and orthorectification** QA process and report the interpolated TIN elevations to the State QA team, who will compare them with field-derived elevations.
4. Vendors shall not use stereo model measurements to measure Z values. Instead the delivered TIN file data shall be used.

3.5.4 PROJECT MANAGEMENT, CONTROL AND DELIVERABLES.

3.5.4.1 Off-shore labor

The Vendor shall specify the types and extent to which off-shore labor is utilized in the performance or work related to this EOI. The SAMB has a stated preference for the use of domestic production resources where possible. However, the SAMB understands that in a competitive global economy, the use of exclusively domestic labor may not be feasible or practical, either technically or economically. ***Vendors will be required to submit a Federal Form SF-328 pertaining to foreign interests, and during negotiations will be asked to provide separate cost estimates based on the use of domestic versus off-shore labor for specific identified tasks.***

3.5.4.2 Management Plan

The Vendor shall propose a management plan for the project, which clearly establishes lines of communication, authority and responsibility with regards to management of the project. The plan must be developed to demonstrate efficient and effective communication on all aspects of the project and to minimize the administrative overhead of SAMB. The plan must also state how the Vendor will ensure that SAMB will receive the deliverables specified above, and in a timely manner that will fit into SAMB's overall purpose and mapping and addressing system. The management plan shall include at a minimum the following items:

3.5.4.3 On Call Point of Contact

An individual or a team of individuals shall be identified by Vendor and contact information provided that will allow SAMB to contact the Vendor's "Point of Contact" anytime during regular business hours (i.e., 8:00 AM to 5 PM), Eastern Standard Time.

3.5.4.4 Project Initiation Meeting and Project Plan

The Vendor shall meet with SAMB within two (2) weeks subsequent to Contract award to review the required Vendor project plan.

The Vendor will present the project schedule and project plan and if possible, the initial flight plan for review and approval by SAMB at the project initiation meeting. The Vendor shall provide a timeline for final flight plan presentation and approval, control survey plan, delivery schedule for all products, and provide a time frame for the State to respond.

The master index map shall be under development and at a minimum include the preliminary tile boundaries (as polygons), state boundary, county boundaries, major metro areas and associated annotation and flightlines already determined.

The Vendor shall summarize all pertinent issues, clarifications and proposed changes resulting from the meeting and shall distribute them to the SAMB for approval within five (5) working days after the project initiation meeting

3.5.4.5 Post-Flight Evaluation Meeting

The Vendor shall meet with the SAMB immediately following the completion of the Spring 2003 flying season, and no later than May 15, 2003. The purpose of this meeting is to evaluate the success of the spring aerial photography acquisition, and to consider alternatives for gaps where weather conditions or other factors precluded successful acquisition of aerial

photography. Any deficient areas shall be included during the Spring 2004 flying season at no expense to the State.

The Vendor shall initially provide the State, as soon as it becomes available, several completed and processed sample frames of imagery (as diapositives) representative of each set of flight conditions that may affect image quality. The State shall select the preferred frame or frames to be used by the Vendor as a template that guides subsequent deliverables and by the State to QA the resultant orthoimagery deliverables.

The Vendor shall summarize all pertinent issues, clarifications and proposed changes resulting from the meeting and shall distribute them to the State for approval within five (5) working days after the initial post-flight evaluation meeting.

3.5.4.6 Status Meetings

The Vendor shall, at a minimum, participate in four (4) additional meetings in Charleston, West Virginia in July 2003, September 2003, November 2003, and January 2004, unless deemed unnecessary by SAMB in consultation with the SAMB Project Manager. Up to two (2) additional meetings may be scheduled as required upon mutual consent of the Vendor and SAMB in consultation with the SAMB Project Manager at no additional cost to the State.

3.5.4.7 Status Reports

The Vendor shall, at a minimum, provide weekly reports to SAMB by email, updating and documenting the status of the project in relation to the project schedule and identifying any issues or concerns. The Vendor shall develop a secure, limited access Project Management Website to assist in the dissemination of project status information to the SAMB, the SAMB project manager, subcontractors, and other project stakeholders where appropriate.

3.5.4.7.1. Bi-weekly Conference Calls

1. The Vendor shall arrange and initiate bi-weekly conference calls, minimally with the SAMB Project Manager. Calls may be suspended after all flying has been completed upon mutual agreement of the SAMB and the Vendor.
2. Calls shall continue until such time as the State is satisfied that all outstanding technical, financial and contractual issues are properly resolved.
3. A draft agenda shall be delivered via e-mail and precede each call by 24 hours.
4. Conference calls shall be coordinated by and paid for by the Vendor.
5. Issues, decisions and outstanding items shall be documented by the Vendor in Microsoft Word (.doc) format and distributed via e-mail within three (3) working days following each call for signature approval by the State.

3.5.4.7.2. Additional Reporting Requirements

For no additional cost, the Vendor shall be responsible for completion of a variety of administrative and reporting requirements, in a format prescribed by the State, and at times as determined necessary by the State.

The Vendor agrees to use Microsoft Office products (i.e., Word, Excel, Access, etc.) to develop textual reports and otherwise document or communicate. ESRI compatible formats (preferably shapefiles) shall be used to depict spatially indexed items. [The Vendor may use other formats if approved in advance by the SAMB.]

1. E-mail attachments shall be delivered in formats readable by Microsoft Outlook, and compressed as necessary (e.g., using WinZip) to reduce file size where applicable.
2. At a minimum, the Vendor shall submit brief, monthly status reports to the State via e-mail, e.g., as a .doc or .pdf file (followed with a mailed paper copy) having these sections:
 - a. Title page indicating project, Vendor, report date, reporting period.
 - b. Report of all outstanding technical, administrative and financial issues or problems, recommendations to solve, and who has the responsibility to fix the problem.
 - c. Updated master index map in electronic form (.pdf or on CD), updated to contain and reflect status of deliveries.
 - d. Table, spreadsheet or chart (e.g. .pdf, Excel or MS Project file) indicating percent of work completed and delivered by process step (survey, imaging, scanning, orientation, elevation compilation, orthorectification, delivered tiles).
 - e. Recommendations that can improve the working relationship between State and Vendor.

3.5.4.7.3. Master Index Map (Web and as a Deliverable)

The Vendor shall create and use (and at the completion of the project, install on State's computers) an electronic master index map in ESRI compatible format. An updated master index map file shall be made available on the web and also be delivered four (4) times during the project via CD to operate on the State's computer. The intent is to use GIS technology to graphically show the interim and final deliverables superimposed over a set of locator base maps.

The file shall include:

1. An ArcGIS project file that includes all of the reference, backdrop, data and index features.
2. When CDs are delivered, a file name strategy that changes each time the file is updated in the form:

WV_Index_yymmdd.ext, where

WV_Index_ = master index map (uses underscores).

yy = last two digits of year (00-99) for this update.

mm = month (01–12) that this version was updated.

dd = day of this update.

ext = ESRI extension appropriate to the data and application to be used.

3. A documented schema and database design able to track work-in-process, deliveries, acceptance timeframes, etc. The index should include GIS query capabilities so status reports can be generated, as required and approved by the State.
4. A backdrop that allows users to know where they are when reviewing deliverables. The Vendor may use the WV GIS clearinghouse website (<http://wvgis.wvu.edu>) to access state and county and transportation feature shapefiles to serve as the georeferenced vector backdrop to the index map. Alternatively, the SAMB will provide the Vendor with an index map.
5. Tile boundaries for each tile (as polygons) for each type of deliverable shall have attribute fields coded with the X-Y georeferenced coordinates of the lower left corner of the tile, the filename, photo date(s), delivery status (flown, processed, rectified, QA complete, delivered, accepted, etc.).
6. An ability to turn on and off all features of detail.
7. Labeled flight lines and eventually the final imagery exposure stations. (The State and the Vendor shall review the master index map and together add or remove full resolution tiles from the index until the State approves the final limits of coverage. This shall be completed before flight maps are developed.)
8. Labeled survey control point locations and attribution.
9. Other indexed points, lines and polygons linked to a relational database having archiving and status attributes and appropriate labeling.
10. Ability to query Relational Database Management System (RDBMS) attribution and highlight appropriate graphic elements.
11. Presentation default mode that allows hardcopy output to depict progress without confused labeling and linework.
12. Installed on the State's networked computer system at the end of the project and before final payment.

3.5.4.8 Data Deliverables

3.5.4.8.1. Incremental deliveries and sign-off

All final products from successfully collected aerial photography shall be incrementally delivered according to the Vendor supplied project plan as approved by SAMB in consultation with the SAMB Project Manager. Final delivery must be submitted and accepted by SAMB within eighteen (18) months of the start date of the Contract.

3.5.4.8.2. File Name conventions

The File naming conventions will be provided by SAMB at the time of the project initiation meeting. In addition to the Digital Orthoimagery files, delivery of all data products produced in the digital ortho-development process required to facilitate the efficient development of additional planimetric and contour features by a third party Vendor is required. This will include but may not be limited to all film, raw scan digital imagery files along with the aerotriangulation solution and set-up and orientation information for the stereo models, ground control, flight lines and control plans, photo indexes, sensors and the DTM data used for rectification. Additionally the flight plan, control report and Aerial Triangulation report (if required) shall be delivered. File formats for digital products will be finalized between the SAMB and the Vendor during negotiations.

3.5.4.9 Project Survey Control and Blind QA Point Deliverables

3.5.4.9.1. Annotated Network Diagram

The Vendor shall submit a detailed control plan superimposed on the flight plan and proposed aerotriangulation blocks prior to fieldwork showing the location of control and blind QA points to be observed. A network diagram should also show the HARN and other NGS points to be tied to and indicate, using symbols and color vectors, the baselines to be independently observed during each session. The vendor shall indicate the survey standard to be used in conducting the survey.

3.5.4.9.2. Session Report

A schedule (in table form) showing the dates, occupation times, and sessions for each station in the survey shall be provided.

3.5.4.9.3. CD-ROM

Ground control and QA control for the project shall be separately documented with all GPS observation data written to CD-ROM in a non-proprietary format agreed upon between the Vendor in consultation with the SAMB Project Manager.

3.5.4.9.4. Observation Logs

An observation form for each temporary ground control station occupation shall be provided that shall include at least the following information: The form is preferred digitally, but paper is acceptable.

1. Project Name
2. Operator's Name
3. Date
4. Julian Day
5. Receiver Serial #
6. Antenna Serial #
7. Brand and name of receiver / antenna

8. Station Name
9. Session #
10. Antenna H.I. and indication for type of measurement
11. File Name
12. Actual start time and actual end time for the occupation
13. Visibility skyplots for each station observed in the network
14. Printed graphical plot indicating the number of satellites above 15 Degrees and the (Position Dilution of Precision) PDOP for each session of field observation
15. Data showing the quality of processed vectors
16. Results of a minimally constrained least squares network adjustment report including (@ 95% confidence region):
17. Statistical results clearly showing which control point is held fixed, and clearly indicating standard errors applied, and the weighting scheme used
18. Station coordinate standard deviations (x, y, z)
19. Station coordinate error ellipses (semi-major axis, semi-minor axis, azimuth of semi-major axis, height)
20. Results of the fully constrained adjustment, clearly showing all values held fixed, and clearly indicating standard errors applied and weighting scheme used
21. Digital ASCII file with minimally constrained coordinate adjustments

3.5.4.9.5. Delivery as Shapefile

An ESRI shapefile describing all **horizontal and vertical control points** used for orienting the captured imagery shall be submitted. Separate sets of shapefiles shall be submitted for the West Virginia State Plane Coordinate System (SPCS) North and South Zone versions of the horizontal control points, with each point attributed according to this section.

3.5.4.9.6. Monumentation

All ground control points collected shall be documented and marked such that they can be easily relocated by other surveyors and survive throughout the timeframe of the project, including QA by the State.

3.5.4.9.6.1 Survey Processing Data Deliveries

The Vendor shall prepare two (2) hard copy bound 8.5" x 11" survey reports, and one (1) copy of the report on CD (e.g., as a .pdf file) that includes:

- a. Title page

- b. Table of contents
- c. Summary of procedures
- d. A post-processing network diagram showing names and locations of all observed points, NGS points, and base stations and color-coded indications of which independent vectors were observed. Include a legend.
- e. Completed GPS observation forms or station logs (digital scans preferred).
- f. NGS documentation for all occupied control points.
- g. Results of a minimally constrained least squares network adjustment report including RMSE (at 95% confidence region) (on CD only preferred):
 - i. Statistical results clearly showing which Continuously Operating Reference Station (CORS) station or compatible control point is held fixed, and clearly indicating standard errors applied and weighting scheme used
 - ii. Station coordinate standard deviations (x, y, z)
- h. Results of the fully constrained least squares adjustment, clearly showing all values held fixed, and clearly indicating standard errors applied and weighting scheme used. All surveys shall be the result of a constrained 3D adjustment using CORS (on CD only preferred).
- i. Microsoft Excel spreadsheet listing point names used in the field (and/or by the aerotriangulation software) and final coordinates in specified projection and units.
- j. An FGDC compliant metadata file that accompanies the survey data.

3.5.4.9.6.2 Additional Data Delivery Items and Formats

1. Horizontal and vertical control points actually used for orienting the captured imagery shall be submitted as attributed, symbolized, point features within the master index map.
2. Each point shall be named, symbolized, and positioned, (and attributed in Z) using the specified projection along with a brief description of each point in sufficient detail to identify the point for future use.
3. Individual TIFF or jpeg image files (from original film scans or georeferenced TIFF ortho image) shall be delivered for each ground control point or QA point. The file names shall correspond to the survey point names.
4. These files shall contain a 250' x 250' patch of ground derived from the raw or orthorectified imagery, centered around the control point imaged at the highest specified Ground Resolution Distance (GRD). The files shall eventually be linked to the control points within the master index map.

5. The blind QA point field coordinates shall be reported using copies of the accompanying Excel spreadsheet. The blind aerotriangulation QA points shall be placed in one file [named AT_QA (area) (Contractor) yymmdd.xls] while the blind orthorectification QA points are delivered in another [named Ortho_QA (area) (Contractor) yymmdd.xls].

3.5.4.9.6.3 QA Documentation

1. The Vendor shall, at their expense, report accuracy of the horizontal control points according to the *Geospatial Positioning Accuracy Standards, Part 2: Standards for Geodetic Networks* developed by the Federal Geodetic Control Subcommittee (FGCS) and the Federal Geographic Data Committee (FGDC), 1998.
2. A Microsoft Excel spreadsheet shall be designed and used to report calculations and statistics.
3. A statement shall be provided and certified that, "These geodetic control data meet the <insert resultant value> centimeter local accuracy standard for the horizontal coordinate values and the <insert actual value> local accuracy standard for the vertical coordinate values (heights) at the 95% confidence level".
4. The inserted values shall be less than or equal to the stated accuracy standards specified above.

3.5.4.10 Aerial Film and Raw Image File Deliverables

During Aerial Flights. The Vendor shall initially provide the SAMB Project Manager several completed and processed sample frames of imagery (as diapositives) representative each set of flight conditions that may affect image quality as soon as it becomes available. The SAMB in consultation with the SAMB Project Manager shall: 1) select the preferred frame or frames to be used by the Vendor as a template; 2) guide subsequent deliverables, and to be used by the State to QA orthoimagery deliverables.

The roll film and/or raw digital image files shall be delivered once the digital orthoimage products have been delivered and accepted.

Each film roll or digital file shall be labeled, indicating the State as owner, Vendor name, date of photography, flight and exposure numbers, type and serial number of camera, focal length, film roll number, film type, and the nominal scale of the negatives.

Each frame shall be labeled with the acquisition date, focal length, nominal scale, roll and frame number and perhaps 1-2 short additional text items as later specified and at the discretion of the State.

The State, at its option and for no additional cost, may elect to use the Vendor's facilities for long-term storage of roll film or sensor tapes.

Delivery of scanned image files used in the production of the digital orthoimagery product shall be delivered in an untiled, uncompressed, TIFF format delivered in a media format pre-approved and acceptable to the SAMB. Media labels shall include project, client, Vendor,

date, order #, contents in readme file. The SAMB will consider an industry standard JPEG compressed scan file as well.

3.5.4.11 Aerial Triangulation

All information related to the image orientation required to facilitate the efficient use of the imagery for additional stereo photogrammetric data development by a third party shall be required for delivery. The exact attribute content and format for the DTM files will be determined by SAMB in consultation with the SAMB Project Manager prior to final delivery.

Deliverables from aerial triangulation shall include at a minimum but not be limited to the following:

1. Two (2) hardcopy, bound, orientation or aerotriangulation (A/T) reports, bound in 8.5" x 11" format, that includes:
 - a. Cover sheet
 - b. Table of contents with tabs
 - c. Narrative description of technique (equipment, software, process, exceptions, problems, resolution)
 - d. Camera calibration reports and listing of which frames used which calibrations
 - e. Hardcopy printouts:
 - i. Color index map showing tie, control and QA points using separate colors and symbols having sufficient scale to read the text labels. (Shape or .dgn format. Include legend.)
 - ii. Excel spreadsheet of blind QA points including name and coordinates (nearest 0.1 feet ONLY)
 - iii. File content documentation (README.TXT file)
 - f. Electronic A/T files (measured, refined, adjusted, ground) on CD, to include:
 - i. File containing ground control points used
 - ii. Raw measured fiducial coordinates for each photo image in the photo coordinate system
 - iii. Raw measured controls points and pass points in the photo coordinate system.
 - iv. Final bundle adjustment printout with highlighted residuals, RMSE, final coordinates.
 - v. Adjusted control points, pass points, photo centers and residuals in the NAD83/96 SPCS coordinate system with NAVD88 elevations
 - vi. Standard deviation of the adjusted control point and pass point measurements
 - vii. ASCII file or Oracle database providing exterior orientation parameters of image frame centers. The final frame ID(s) (a frame may have one or more IDs named during various field and office production steps) and six

- orientation parameters [E, N, elevation (to 0.1 feet) and omega, phi and kappa (decimal degrees to 6 places) as generated from A/T or sensor]
- viii. Camera focal length used in adjustment
 - ix. RMSE values for all adjustments
 - g. One (1) CD containing the above report and orientation data files, plus the following items:
 - i. CD labeled to include project, client, author, date, order #, contents.
 - ii. Printout of label and directory and files contained on CD in hardcopy report.
 - iii. Report narrative that explains process, software, problems, and solutions.
 - iv. README.TXT file
 - v. A/T files as specified above, readable in WORDPAD or WORD without line wrap-around.
 - vi. Excel spreadsheet containing all QA points, pass points and control points. Include columns for point ID, E, N, elevation, use code:(QA, control, pass, tie), notes (alternate ID). Report coordinates to nearest 0.1 feet ONLY.
 - vii. Index file features to include control plot diagram (symbolized in color, using different symbols and colors to show H, V and combined H&V control points, QA check points, tie points).
 2. If the Vendor creates or uses additional annotated control prints or pugged diapositives, these shall also be delivered.
 3. All other materials used by the Vendor to orient the imagery along with sufficient organization and documentation for a trained photogrammetrist to recover the orientation results shall be delivered.

3.5.4.12 Digital Terrain Model (DTM)

All information related to the DTM used for ortho rectification required to facilitate the efficient use of the imagery for additional data development by a third party shall be required for delivery.

3.5.4.12.1. DTM Delivery Tile Format

1. Files exactly encompassing geographic areas of 10,000 feet by 10,000 feet shall be used to deliver elevation data unless the State and the Vendor agree that another size is more practical.
2. CDs or DVDs shall be used as the delivery media.
3. Two (2) separate sets of files shall be delivered.
4. All media shall be clearly labeled to reflect project, client, author, date, order #, contents.

3.5.4.12.2. DEM ASCII Data File Format

1. The Vendor shall deliver an ASCII point file of XYZ coordinates with separate coding for mass points and breaklines expressed in units of measure required both by the mapping deliverables. ASCII file formats shall contain five aligned and space-delimited columns containing X-Coordinate, Y-Coordinate, Z-Coordinate, breakline type, point code.
 - a. Breakline types are:
 - i. Soft
 - ii. Hard
 - iii. Mass
 - iv. Lake or exclusion area
 - v. Spot
 - b. Point code attributes are:
 - i. 1=start of breakline
 - ii. 2=point within breakline
 - iii. 3=not used
 - iv. 4=end of breakline
 - v. 5=mass point, not part of breakline
2. The ASCII format eventually used must contain intelligently coded features to be able to be imported into and delivered in an ESRI TIN format (3D Analyst).
3. An alternative ASCII delivery format may be otherwise defined by the Vendor and approved by the State prior to delivery.

3.5.4.12.3. TIN Surface Files

The resultant TIN shall also be delivered as an ESRI TIN file useable in 3D Analyst.

3.5.4.12.4. Elevation Metadata

The ASCII DEM file shall be accompanied with an FGDC-compliant metadata file.

3.5.4.13 Planimetric Data and Digital Orthoimagery Delivery Tile Formats

For all areas, one resolution of imagery will be developed for any given tile, and each counted tile shall be complete in extent and of a single consistent resolution. In some cases it is understood there will be duplication of tiles due to overlap between areas of different resolution, but overlap of imagery between areas of different resolutions (scale) shall be minimized to the extent practical.

3.5.4.13.1. Nested Tile Configuration

2,000' design scale for planimetric deliveries	50,000' x 50,000'
400' design scale orthos, 2-foot GSD, and DTMs	10,000' x 10,000'
100' design scale orthos, 0.5-foot GSD	2,500' x 2,500'

3.5.4.13.2. Content

The tile totals for each resolution shall be calculated by summing all 10,000' x 10,000' tiles with 2-foot GSD, summing all 2,500' x 2,500' tiles with 0.5-foot GSD. Tile totals shall represent a conservative estimate of the numbers of tiles for each resolution with considerable overlap of tiles resulting in a total area that exceeds the actual land area of West Virginia. Where the SAMB selects the areas of supplemental or optional high resolution 100' design scale mapping, the underlying whole, medium resolution 400' design scale tiles will be eliminated. Only whole ortho tiles shall be delivered.

3.5.4.13.3. Orientation

The grid tiles to be used shall be oriented using the West Virginia State Plane Coordinate System (SPCS), West Virginia State Plane Grid, North and South Zones, NAD83, using the origin point for the West Virginia SPCS (0,0). Tiles shall be aligned with the West Virginia SPCS grid, using either the North or South Zone depending on the extent of the county in the area of coverage. (See Figure 1 for delineation of North and South State Plane Zones.)

Tile overlap will be required along the line separating the North and South SPCS zones. If a full grid tile provides less than 1,000 feet of orthoimagery overlap between the two zones, an additional full grid tile or tiles shall be processed to provide a minimum of 1,000 feet of overlap on each side of the State Plane Zones boundary.

3.5.4.13.4. Nesting

Tiles shall be aligned and referenced to each other so they can be nested for vertical integration at the different scales of orthoimagery. For example, each 10,000' x 10,000' tile will optionally contain sixteen (16) nested 2,500 ft x 2,500 ft tiles. For the purposes of planimetric data, each 50,000' x 50,000' tile will optionally contain exactly twenty-five (25) nested 10,000' x 10,000' tiles.

3.5.4.13.5. Formats

Each final digital orthoimage tile shall be delivered in a GeoTIFF File Format v 6.0 or later, operational using ESRI and Intergraph and a MrSID compressed format operational using ESRI and Intergraph, with one (or more if overlapping delivery areas) file for each neat tile. The exact compression parameters will be decided by SAMB in consultation by the SAMB Project Manager based on file size and image quality prior to delivery of the final product.

Since TIFF World files shall be delivered, the point of origin shall be the center of the upper left pixel in each tile. If Geotiff image files header shall also reference the center of the pixel located in the upper left hand corner of the tile as the point of origin.

Vector data shall be delivered in ESRI shapefile format using a schema developed by the Vendor and approved by the State.

SAMB will require the following deliverable products and media:

Table 1
Media Deliverables

Item	Number	Description	Format	Media***
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Item	Number	Description	Format	Media***
1	1	Statewide Coverage of Digital Ortho Imagery, Digital Terrain Models, Planimetry and all Ancillary Data*	Geotiff ASCII TIN Shape	DVD
2	1	Statewide Coverage of Digital Ortho Imagery, Digital Terrain Models, Planimetry and all Ancillary Data*	Geotiff ASCII TIN Shape	DLT
3	1	Statewide Coverage of Digital Ortho Imagery by 10,000' tiles	Geotiff	DVD
4	1	Statewide Coverage of all planimetry by 50,000' tiles	Shape	DVD
5	1	Statewide Coverage of transportation layer only by 50,000' tiles.	DGN	DVD
6	1	Statewide Coverage of Digital Ortho Imagery Compressed in MrSID format by Tile	MrSID	DVD
7	1	Statewide Coverage of Digital Terrain Models by 10,000' tile	ARCgrid ASCII	DVD
8	55	1 set of individual county coverages * of Digital Ortho Imagery and planimetry by Tiles	Geotiff	DVD
9	55	1 set of individual County Coverages of Digital Terrain Models by Tile	ASCII TIN	DVD
10	55	1 set of Individual County Coverages of all Planimetric Data**	various	DVD

*55 individual sets of media, each set containing a complete block of tiles covering the extent of each of West Virginia's 55 counties, [one media set for each of West Virginia's counties] buffered by one image tile.

** All data products produced in the digital ortho development process are required to facilitate the efficient development of additional planimetric features for E-911 addressing or to derive elevation contour features by a third-party Vendor at a later date.

*** Given the anticipated large file sizes and advances in storage technology, consideration may be given to replacing described media with stand-alone external devices such as Firewire or USB 2 hard drives, etc. or other approved devices at the time of delivery. Ownership of these devices shall revert to the State upon successful delivery of the data.

3.5.4.13.6. Metadata

The Vendor shall provide metadata compiled to the current standard endorsed by the Federal Geographic Data Committee (FGDC) for each of the data deliverables. Currently, this is the Content Standard for Digital Geospatial Metadata Version 2 (FGDC-STD-001-1998). Metadata shall be provided in ASCII format capable of being parsed by the "mp" metadata

parser available from the Federal Geographic Data Committee (FGDC), or equivalent FGDC approved metadata parsers.

3.5.4.13.7. *Digital Tile index*

If not provided within the master index map, the Vendor shall provide a digital tile index to be delivered as an ESRI shapefile with the following minimum attribution:

- a) File name
- b) Time imagery collected (Eastern Standard Time)
- c) Date of imagery
- d) X-Y State Plane coordinates in lower left hand corner of the tile
- e) Corresponding DTM data file name
- f) Corresponding orientation parameters or file name
- g) Corresponding raw image file names

Additional attributes may be required which will be determined jointly by SAMB in consultation with the SAMB Project Manager and the Vendor during contract negotiations.

3.5.4.13.8. *Project Procedures Guide*

The Vendor shall prepare a **Project Procedures Guide** detailing production processes and Quality Assurance and Quality Control (QA/QC) procedures employed to insure that all products meet the required accuracy and performance standards of these specifications.

3.5.4.13.9. *Optional Map Plotting Package*

1. Vendor shall optionally provide or develop a utility program (using the VBA scripting language, written for the ArcGIS platform, or compatible) that allows SAMB or the Project Manager to create and print finished rectangular maps at any scale (nominally 1:1,200, 1:2,400, 1:4,800, 1:12,000, 1:24,000 and 1:100,000 scales).
2. User may specify map extent by a listing a series of tiles or selecting a geographic area by coordinate ranges or by selecting the lower left coordinates and indicating a size and scale of mapsheet. Users shall also have the ability to enter a set of bounding coordinate pair that activates the appropriate tile or tiles to be contained within the map or enter the tile name and activate a plot using default bounding coordinates. The plotting package should also be able to refer to select tiles from the WV project index map when selecting areas to plot.
3. Scripts that pre-establish a given map and its output parameters shall be able to be created and executed in batch mode.
4. A mock-up showing margins, east-west readable content, title block, etc., shall be developed by the Vendor and approved by SAMB or the Project Manager prior to the development of the system. The Vendor understands and agrees that a significant amount of design give and take may be required to finalize the map surround functionality.
5. The map generation program shall include built-in indexing that spatially relates the desired mapsheet-bounding rectangle to the proper inclusive tiles.

6. Margin elements shall include: title block, tile name, verbal and bar scale, coordinate datum and projection, accuracy statement, North arrow, date and scale of photography, date of production, tile location diagram and adjoining tile identification, Vendor name, legend, labeled coordinate tics in English and metric units and corner coordinates.

During negotiations, the Vendor will be asked to indicate how long the price of providing this optional service shall remain in effect.

3.6 VENDOR QUALIFICATIONS, EXPERIENCE AND REFERENCES

Vendors shall specify in detail the experience of the Vendor in similar large scale mapping projects. Scores will be based on successful experience, with special emphasis on successful experience by Vendors on providing deliverables for successful mapping projects and systems, particularly those like the overall project being undertaken by SAMB. Scores will be made on the same basis as for the technical performance criteria set forth in subsection 3.5 above, that is, Technical Imagery and Related Specifications, Project Control and Orientation, Image Processing, and Project Management and Deliverables. Vendors must separately specify in detail their qualifications and experience in each of those categories, with reference to the specific criteria set forth above. Proposals must include separate sections stating qualifications for each of the above categories, and must list specific, successful mapping projects and systems, with contact names, physical address, email, and telephone and fax numbers.

A minimum of three (3) written references is required.

3.7 LEGAL AND GENERAL TERMS AND CONDITIONS

The winning Vendor must agree to and comply with the terms and conditions of Form WV-96 (Agreement Addendum) and any other terms and conditions that may be required by SAMB, the Purchasing Division, or the West Virginia Attorney General's Office.

PART 4. PROPOSAL FORMAT

4.1 VENDOR'S PROPOSAL FORMAT

- 4.1.1. Section I. Written Narrative, as Section 4.2.2
- 4.1.2. Section II. Vendor Qualifications, as per Part 3 and Section 4.2.2
- 4.1.3. Section III. Specific Plans, as per Part 3 and Section 4.2.2
- 4.1.4 Section IV. Task Check Sheets (Attachments A, B, C)

If applicable, sign and submit an attached West Virginia Resident Vendor Preference Certificate with the proposal. The form is available at <http://www.state.wv.us/admin/purchase/vrc/Venpref.pdf>

4.2 EVALUATION PROCESS, SPECIFIC PROPOSAL INSTRUCTIONS AND CRITERIA FOR TECHNICAL PROFICIENCY SCORE

4.2.1 METHOD OF EVALUATION

A committee of three to five (3-5) individuals selected by the SAMB will evaluate the submitted proposals in accordance with the criteria stated in this EOI. The Vendor who meets all of the mandatory specifications and attains the highest point score of all vendors, out of a possible one-hundred (100) points maximum, shall be awarded the contract. The selection of the successful vendor will be made by a consensus of the evaluation committee. *Scores will be based as per Section 4.3 below.*

4.2.2 SPECIFIC PROPOSAL INSTRUCTIONS

Proposals should be as thorough and detailed as possible so that SAMB evaluation committee may properly evaluate the Vendor's capabilities to provide the required services. Vendors are required to submit the following items as a complete proposal:

4.2.2.1 The Company

The Vendor shall provide a written narrative statement to include at a minimum:

- a. Experience in providing the services described herein.
- b. Names, qualifications and experience of personnel to be assigned to the project.
- c. Resumes of staff to be assigned to the project.
- d. Names, addresses, titles and contact numbers for at least three (3) previous clients or customers
- e. Specific plans for providing the proposed services

4.2.2.2 The Services

Proposals shall address the following services, which are generally, but not necessarily, descriptive of those that may be required to complete this project (see also Attachments A-C).

- a. Development of a project schedule
- b. Conduct coordination meetings
- c. Establish project control
- d. Capture Aerial photography or airborne imagery
- e. Convert digital imagery (if required per line d above)
- f. Orient imagery to ground control
- g. Generate Digital Terrain Model (DTM)
- h. Compile planimetric features
- i. Generate digital orthoimagery
- j. Radiometrically balance, edge-match and smooth orthoimages
- k. Tile and compress orthoimages

I. Process and deliver final deliverables

4.2.2.3 References, Qualifications, and Supporting Materials

Vendors shall submit the following supporting materials detailing their qualifications and relevant experience, including but not limited to (Cross-reference and comply also with subsection 3.6 above):

- a. Submit a minimum of three (3) written references, each confirming successful results in the completion of similar relevant large-scale mapping projects.
- b. Proof of current professional licensure and certification (e.g. ISO9002, NCEES, ACSM, ASPRS, etc.)
- c. Proof of satisfactory performance in existing Qualifications Based Federal contracts (e.g. USGS CSC2, NIMA Omnibus, etc.).
- d. Documented successful completion of comparable statewide mapping projects or other projects of similar scope in size and complexity that were delivered on time and within budget, and using the same subcontractors, if relevant.

Although not required by the State for the purposes of this EOI, Federal Standard Forms SF-254 (Architect-Engineer and Related Services Questionnaire) and SF-255 (Architect-Engineer and Related Services Questionnaire for Specific Project) pertaining to Qualifications Based Selection, may be submitted as supporting documentation. If a Vendor chooses to submit a SF-255, the Vendor's technical approach and response to Parts 3 and 4 of this EOI should be included in Section 10 of SF-255.

4.2.2.4 Specific Plan for Compliance

Vendors shall submit a specific plan for complying with the terms of this EOI, including but not limited to (cross-reference and comply with subsection 3.5 above):

- a. Use of appropriate technology (hardware, software, techniques)
- b. Quality Assurance and Quality Control (QA/QC) strategy
- c. Appropriate and technically sound methods, workflow and data proposed that will produce the required deliverables
- d. Compliance with project specifications, industry standards, etc.
- e. A sound project management plan, including demonstration of the allocation of sufficient resources to complete all aspects of the work on time and within budget

4.2.2.5 Project Plan of the Vendor

Vendors shall submit a detailed project plan for addressing all of the steps in the above process while addressing each of the product specifications indicated in Section 3.

4.2.2.6 *Aerial Overflights*

The Project Plan of the Vendor shall provide an estimate of the number of aircraft on call and immediately available for the collection of the aerial photography, the total number of aircraft estimated to be used for the duration of photo acquisition, as well as an estimate of the number of personnel needed to establish ground control.

4.2.2.7 *Re-Flights*

The Vendor shall present a plan for re-visitation of areas in the event of image rejection during the Quality Control (QC) process, or where original imagery could not be collected because weather or groundcover conditions, or other factors outside the control of the Vendor precluded collection at the scheduled time of the flyover. Mechanical or technical problems shall not be considered a legitimate reason for non-collection.

4.2.2.8 *Proficiency*

Scores for technical proficiency shall be based as specified above and in subsection 3.5 for all Vendors who also meet all minimum requirements.

4.3 EVALUATION CRITERIA

Proposals shall be evaluated by SAMB using the following criteria, as per Section 3 and Sections 4.1 and 4.2 above:

	POINT VALUE
Technical Proficiency	30
References, Qualifications, and Supporting Materials	30
Specific Plan for Compliance	30
Oral Presentation and Interview (Short List Candidates only)*	10*
Scope of Contract Services Total	100

4.3.1 *DEVELOPMENT OF "SHORT LIST" OF VENDORS AND INTERVIEWS*

The written submissions will be evaluated, and a "short list" of at least three (3) Vendors will be developed based on that evaluation. In the event less than three Vendors bid, the State reserves the right to interview all Vendors or withdraw this EOI, at its sole option. All Vendors on the "short list" will be given an opportunity for an oral presentation/ interview, in order to discuss the Vendor's anticipated concepts and proposed method of approach to the assignment, including clarification of qualifications and performance data, the scope of services offered, and the needed time to complete the project.

Any Vendor who is not available for an oral presentation/ interview within the schedule of the evaluation committee and SAMB's overall project schedule will be disqualified.

A Vendor's failure to provide complete and accurate information shall be considered grounds for disqualification. The State reserves the right if necessary to ask vendors for additional information to clarify their proposals.

4.3.2 CRITERIA FOR ORAL PRESENTATION / INTERVIEWS

The oral presentation will be evaluated based on the overall impression the Vendor gives as to the Vendor's ability to deliver in accordance with the written proposal, as well as based on other factors related to the oral presentation that may reflect on the Vendor's ability to perform. Evaluations may include, but are not limited to, the following criteria:

- Credibility of the presentation
- Clarity of the presentation
- Persuasiveness of the presentation
- Background understanding of the SAMB and the statewide addressing project
- Subject matter knowledge and expertise shown in the presentation
- Ability to adapt standard practices and technology to meet the demands and unique characteristics of orthoimagery acquisition, planimetric mapping, and addressing for E-911 purposes to West Virginia
- Participation of principle Vendor personnel at the presentation meeting
- Ability to answer questions clearly and concisely
- Other factors that may reflect on the Vendor's ability to perform

Presenters are permitted (and, where effective, encouraged) to use multi-media forms of presentation, including PowerPoint, videotape, computer animation, etc. Vendors should identify any special needs for equipment in advance of the presentation. A copy of presentation materials shall be requested by the SAMB for its use. Information in the Vendor presentation of a proprietary or sensitive nature shall be avoided.

4.3.3 NEGOTIATIONS AND CONTRACT AWARD

After the oral presentation/interviews have been completed, the evaluation committee will commence negotiations as to scope of services and price with the firm or team of firms determined by consensus evaluation by the evaluation team to be the highest qualified Vendor. At the start of negotiations, the Vendor will be expected to provide immediate and detailed pricing for the projected eighteen (18) month completion schedule, including costs for any preliminary planning and project wrap-up, per the format provided as Attachments A, B, C in Section 4.3.4 below.

If SAMB fails to negotiate a satisfactory contract with the highest qualified vendor at a fee to be determined by SAMB, in its sole discretion, to be fair and reasonable, negotiations will commence with the firm of second choice. Failing that, negotiations will commence with the third most qualified firm, and so on until negotiations have failed, in turn, with all firms on the short list. In no situation, after negotiations have been terminated with a firm, will negotiations be reopened with that firm. Should the agency be unable to negotiate a satisfactory contract with any of the originally selected professional firms, it shall select additional professional firms in order of their competence and qualifications and it shall continue negotiations in accordance with this section until an agreement is reached.

4.3.4 ATTACHMENTS

Vendors shall use each of the following Attachments as a guide to define the Tasks for the proposed project:

ATTACHMENT A: TASKS (400' DESIGN SCALE ONLY, STATEWIDE COVERAGE).

ATTACHMENT B: TASKS (100' DESIGN SCALE ONLY, SUPPLEMENTAL AREAS 1-6).

ATTACHMENT C: TASKS (100' DESIGN SCALE ONLY, UNDEFINED URBANIZED AREAS).

ATTACHMENT D: GRID MAP TEMPLATE (400' and 100'; WV STATE PLANE NORTH AND SOUTH ZONES, NAD83).

NO "COST," "PRICE," OR "FEE" QUOTATION SHALL BE REQUESTED, INCLUDED OR PERMITTED IN THE EOI RESPONSE.

4.3.4.1 ATTACHMENT A: TASKS (400' DESIGN SCALE ONLY, STATEWIDE COVERAGE):

[Instructions to Vendors: The following list of tasks will allow the SAMB to evaluate the level of effort required to of mapping at 400' mapping scale for the contiguous areas of West Virginia with the product specifications and the project development life-cycle described in Parts 3 and 4 above of the EOI. The State will use this list to calculate an independent government cost estimate associated with mapping other areas in the state at 400' mapping scale and provide a template to equitably compare the individual Vendor proposals. The list shall also form the basis of negotiating costs with the successful vendor. The Vendor shall acknowledge that the Vendor can comply with the REQUIRED mapping tasks identified in ATTACHMENT A TASKS 1-13. Failure to acknowledge compliance with each of the REQUIRED TASKS 1-13 shall be considered grounds for rejection of the Vendor proposal. Secondly, the Vendor shall provide verification that the Vendor can comply with the three OPTIONAL TASKS A 14-16 (map plotting, compile structure footprints & generate contour grade DTMs). The listed Tasks will be used to guide the discussions during the negotiations, when the Vendor will be asked to describe any and all subtasks and costs associated with the major tasks in as much detail as possible, and include appropriate intermediate QA/QC steps within each task and description. DO NOT include costs in the response to this section]

REQUIRED TASKS (400' design scale, statewide)	VENDOR COMPLIANCE (Y/N)
TASK 1. Development of a project schedule and preliminary project planning	_____
TASK 2. Conduct project coordination meetings	_____
TASK 3. Establish Project Control and blind QA	_____
TASK 4. Capture Aerial photography or airborne imagery	_____
TASK 5. Convert (scan) to digital imagery (if required per TASK 4)	_____
TASK 6. Orient imagery to ground control (AT)	_____
TASK 7A. Compile transportation features	_____
TASK 7B. Compile structures features	_____
TASK 7C. Compile hydrographic features	_____
TASK 8. Generate Digital Terrain Model (DTM)	_____
TASK 9. Generate digital orthoimagery	_____
TASK 10. Radiometrically balance, edge-match and smooth orthoimages	_____
TASK 11. Tile and compress orthoimages	_____
TASK 12. Process and deliver final deliverables	_____
TASK 13. Project wrap-up meetings	_____

OPTIONAL TASKS (AT 400' DESIGN SCALE ONLY):

[Instructions to Vendor: Describe any other work that the Vendor considers may be needed that was not included in the above Required Tasks 1-13 (itemize as needed). Note: Optional Items may NOT be included in final evaluations or negotiations at the discretion of the EOI evaluation committee.]

OPTIONAL TASKS (400' design scale):**VENDOR COMPLIANCE (Y/N)**

TASK 14. Map Plotting Package (compatible with ESRI ArcGIS).
(shall be able to be used at all scale combinations)

TASK 15. Optional work to compile all structure footprints, inhabited or not, without centroids, statewide [SAMB will add this work to **TASK 6B**, Attachment A if this option is selected]

TASK 16. Optional work to upgrade DTM integrity to deliver ten foot (10'), labeled ASPRS, class 2 contours, statewide. [SAMB will add this work to TASK 7, Attachment A if this option is selected.]

OTHER OPTIONAL TASKS. Specify below. (For 400' design scale only.)

NO "COST," "PRICE," OR "FEE" QUOTATION SHALL BE REQUESTED, INCLUDED OR PERMITTED IN THE EOI RESPONSE.

End ATTACHMENT A: TASKS (400' DESIGN SCALE ONLY, STATEWIDE COVERAGE):

4.3.4.2 ATTACHMENT B: TASKS (100' DESIGN SCALE ONLY, SUPPLEMENTAL AREAS 1-6)

[Instructions to Vendors: The following lists of tasks will allow the SAMB to evaluate the level of effort required to of mapping at 100' mapping scale for the six pre-defined areas of West Virginia with the product specifications and the project development life-cycle described in Parts 3 and 4 above of the EOI. The SAMB will use this list to calculate an independent government cost estimate associated with mapping pre-defined areas in the State at 100' mapping scale and provide a template to equitably compare the individual Vendor proposals. The list shall also form the basis of negotiating costs with the successful Vendor. The Vendor shall provide verification that the Vendor can comply with the standard mapping tasks identified in ATTACHMENT B REQUIRED TASKS 1-13. Secondly, the Vendor shall provide verification that the Vendor can comply with the two OPTIONAL TASKS B 14-15 (compile structure footprints & generate contour grade DTMs). The listed tasks will be used to guide the discussions during the negotiations, when the Vendor will be asked to describe any and all subtasks and costs associated with the major tasks in as much detail as possible, and include appropriate intermediate QA/QC steps within each task and description. DO NOT include costs in the response to this section. Please use a separate sheet for each of the pre-defined supplemental 100' design scale areas. Name Attachments B 1, B2, B3, etc.]

Supplemental Areas: Counties

1. Kanawha Valley: Wayne (north half), Cabell, Putnam, Kanawha
2. I-77/64 Corridor: Fayette, Raleigh, Mercer
3. I-79 Corridor: Monongalia, Marion, Harrison
4. Northern Panhandle: Hancock, Brooke, Ohio, Marshall
5. Eastern Panhandle: Berkeley, Jefferson, Morgan, Mineral (Cumberland MSA vicinity)
6. Wood County

REQUIRED TASKS (100' design scale only)

VENDOR COMPLIANCE (Y/N)

TASK 1. Development of a project schedule and preliminary project planning	_____
TASK 2. Conduct project coordination meetings	_____
TASK 3. Establish Project Control and blind QA	_____
TASK 4. Capture Aerial photography or airborne imagery	_____
TASK 5. Convert (scan) to digital imagery (if required per TASK 4)	_____
TASK 6. Orient imagery to ground control (AT)	_____
TASK 7A. Compile transportation features	_____
TASK 7B. Compile structures features	_____
TASK 7C. Compile hydrographic features	_____
TASK 8. Generate Digital Terrain Model (DTM)	_____
TASK 9. Generate digital orthoimagery	_____
TASK 10. Radiometrically balance, edge-match	_____

and smooth orthoimages _____

TASK 11. Tile and compress orthoimages _____

TASK 12. Process and deliver final deliverables _____

TASK 13. Project wrap-up meetings _____

OPTIONAL TASKS (100’ DESIGN SCALE ONLY)

[Instructions to Vendor: Describe any other work that the Vendor considers may be needed that was not included in Attachment A Tasks 1-13 (itemize as needed). Please use a separate sheet for each of the pre-defined supplemental 100’ design scale areas. Name Attachments B1, B2, B3, etc. Vendors are permitted to identify additional Supplemental Areas for consideration. However, additional areas may NOT be included in final evaluations or negotiations at the discretion of the EOI evaluation committee. The Vendor shall be prepared to discuss estimates of the reduction in 400’ design scale costs due to eliminating 400’ design scale maps in the 100’ design scale areas during the Vendor negotiations. DO NOT include any costs in the response to this section. Note: Optional Items may NOT be included in final evaluations or negotiations at the discretion of the EOI evaluation committee.]

OPTIONAL TASKS (100’ design scale only)

VENDOR COMPLIANCE (Y/N)

TASK 14. Optional work to compile all structure footprints, inhabited or not, without centroids, per area.

[SAMB will add this work to **TASK 6B**, Attachment B (per area) if this option is selected] _____

TASK 15. Optional work to upgrade DTM integrity to deliver two-foot (2’), labeled ASPRS, class 2 contours, per area. [SAMB will add this work to TASK 7, Attachment B (per area) if this option is selected.] _____

Additional Supplemental areas: (Specify below)

OTHER OPTIONAL TASKS. SPECIFY BELOW (FOR 100’ DESIGN SCALE ONLY).

NO “COST,” “PRICE,” OR “FEE” QUOTATION SHALL BE REQUESTED, INCLUDED, OR PERMITTED IN THE EOI RESPONSE.

End: ATTACHMENT B: TASKS (100’ DESIGN SCALE ONLY , SUPPLEMENTAL AREAS 1-6):

4.3.4.3 ATTACHMENT C: TASKS (100’ DESIGN SCALE ONLY, UNDEFINED URBANIZED AREAS.)

[Instructions to Vendors: The following list of tasks will allow the SAMB to evaluate the level of effort required to complete mapping at 100’ mapping scale for the remainder of currently

undefined urbanized areas West Virginia with the product specifications and the project development life-cycle described in Parts 3 and 4 above of the EOI. The SAMB will use this list to calculate an independent government cost estimate associated with mapping currently undefined urbanized areas in the State at 100' mapping scale and provide a template to equitably compare the individual Vendor proposals. Estimated work effort shall be calculated on a per square mile basis. The list shall also form the basis of negotiating costs with the successful Vendor. The Vendor shall provide verification that the vendor can comply with the REQUIRED TASKS identified in TASKS 1-13. Secondly, the vendor shall provide verification that the vendor can comply with the two OPTIONAL TASKS 14-15 (compile structure footprints & generate contour grade DTMs). The listed tasks will be used to guide discussions during negotiations, when the Vendor will be asked to describe any and all subtasks and costs associated with the major tasks in as much detail as possible, and include appropriate intermediate QA/QC steps within each task and description. DO NOT include any costs in the response to this section]

REQUIRED TASKS (100' DESIGN SCALE ONLY) VENDOR COMPLIANCE (Y/N)

- TASK 1. Development of a project schedule and preliminary project planning _____
- TASK 2. Conduct project coordination meetings _____
- TASK 3. Establish Project Control and blind QA _____
- TASK 4. Capture Aerial photography or airborne imagery _____
- TASK 5. Convert (scan) to digital imagery (if required per TASK 4) _____
- TASK 6. Orient imagery to ground control (AT) _____
- TASK 7A. Compile transportation features _____
- TASK 7B. Compile structures features _____
- TASK 7C. Compile hydrographic features _____
- TASK 8. Generate Digital Terrain Model (DTM) _____
- TASK 9. Generate digital orthoimagery _____
- TASK 10. Radiometrically balance, edge-match and smooth orthoimages _____
- TASK 11. Tile and compress orthoimages _____
- TASK 12. Process and deliver final deliverables _____
- TASK 13. Project wrap-up meetings _____

OPTIONAL TASKS (AT 100' DESIGN SCALE ONLY):

[Instructions to Vendor: Describe any other work that the Vendor considers may be needed that was not included in Attachment C Tasks 1-13 (Itemize as needed). Estimated work effort shall be calculated on a per square mile basis. Note: Optional Items may NOT be included in final evaluations or negotiations at the discretion of the EOI evaluation committee.]

OPTIONAL TASKS (100' design scale only)

VENDOR COMPLIANCE (Y/N)

TASK 14. Optional work to compile all structure footprints, inhabited or not, without centroids.
(calculate on a per square mile basis)
[SAMB will add this work to **TASK 6B**, Attachment C if this option is selected.]

TASK 15. Optional work to upgrade DTM integrity to deliver two foot, labeled ASPRS, class 2 contours.
(calculate on a per square mile basis)
[SAMB will add this work to TASK 7B, Attachment C if this option is selected.]

OTHER OPTIONAL TASKS. Specify below
(for 100' design scale only)

NO "COST," "PRICE," OR "FEE" QUOTATION SHALL BE REQUESTED, INCLUDED OR PERMITTED IN THE EOI RESPONSE.

End ATTACHMENT C: TASKS (100' DESIGN SCALE ONLY, UNDEFINED URBANIZED AREAS).

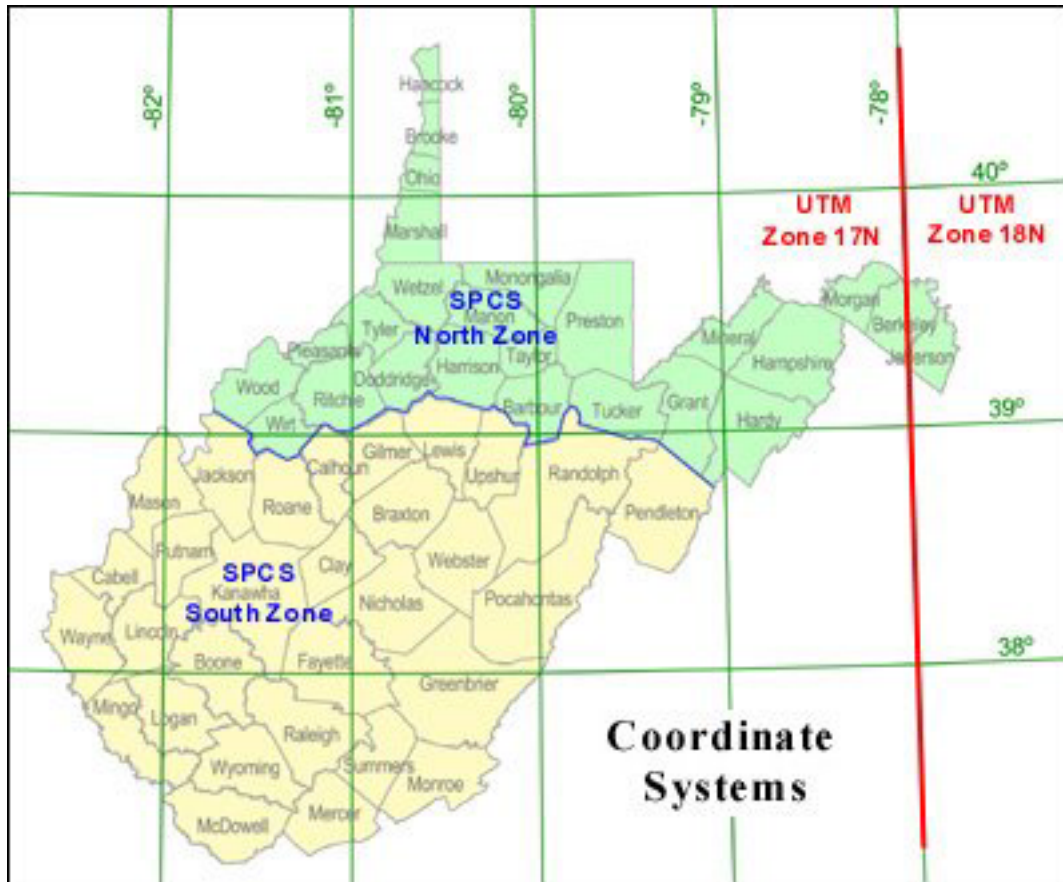
4.3.4.4 ATTACHMENT D: GRID MAP TEMPLATE (400' AND 100'; WV STATE PLANE NORTH AND SOUTH ZONES, NAD83)

SEE MAP INSERT. If hard copy insert is not included obtain a .pdf copy from:

<ftp://ftp.wvgis.wvu.edu/wvsamb/eoi-sam0202/maps>

End ATTACHMENT D: GRID MAP TEMPLATE (400' AND 100'; WV STATE PLANE NORTH AND SOUTH ZONES, NAD83)

THIS AREA INTENTIONALLY BLANK

FIGURE 1. WEST VIRGINIA STATE PLANE NORTH AND SOUTH ZONES

For a specific list of counties, also see:
http://wvgis.wvu.edu/otherdocs/standardsandpubs/spcs_wvcode.pdf