



MID-MISSOURI PUBLIC PURCHASING COOPERATIVE
REQUEST FOR BID (RFB)

Sheet 1 of 25

Bid No.:

(MM32)

Date of Bid:

(January 4, 2002)

Buyer Contact Name: Marlene Ridgway

Phone Number: (573) 886-4392

Bid Closing:

Date: January 29, 2002

Time: 9:15 A.M.

Please Note -- Pre-Bid Conference:

Date: January 18, 2002

Time: 9:00 A.M.

Commodities or Service Requested: **DIGITAL ORTHOPHOTO BASE MAPS, PLANIMETRIC AND TOPOGRAPHIC MAPPING.**

Please submit your sealed bid prior to the date and time for Bid Closing as specified above to the following office:
Pre-Bid Conference will be held at the address below:

Boone County Purchasing

601 E. Walnut, 2nd Floor

Columbia, MO 65201

(573) 886-4392



MID-MISSOURI PUBLIC PURCHASING COOPERATIVE
INSTRUCTIONS AND GENERAL CONDITIONS OF BIDDING

Sheet 2 of 25
Bid No. MM32

MMPPC Form No. 9401 (3/94)

The Mid-Missouri Public Purchasing Cooperative, herein after referred to as Cooperative, was developed in order for its members to create volume buying through standardization of quality in order to secure a greater return for the expenditure of public funds. Only Mid-Missouri governmental agencies are permitted to become members of this Cooperative.

1. Sealed bids, subject to Instructions and General Conditions, General Provisions, and any special conditions set forth herein, will be received at the Office of the Cooperative Member Agency whose address is stated in the bid documents until the bid closing date and time indicated herein for furnishing the Cooperative Member Agencies with the material and/or list of materials, supplies, equipment or services shown on the attached sheet(s).
2. Bidders must use the bid forms provided for that purpose in submitting bids, must return the announcement and bid sheets comprising this bid, give unit price, extend totals, and must contain an original legally authorized signature. Bids must be submitted in a sealed envelope identified with the bid number and date of closing. If you do not care to bid, please return bid sheets(s) and note your reason. No fax or electronic transmitted bids will be accepted.
3. Identify the item(s) you will furnish by brand of manufacturer's name and catalog numbers. Also furnish specifications and descriptive literature.
4. Whenever products or materials of any particular producer or manufacturer are mentioned in our specifications, such product or material mentioned is intended to be descriptive of type or quality and not restrictive to those mentioned.
5. The right is reserved to accept or reject all or part of the bid, to waive technicalities, and to accept the offer the Cooperative considers the most advantageous to the Member Agencies. Awards will be made to the bidder whose bid (1) meets the specifications and all other requirements of the RFQ and (2) is the lowest and best bid, considering price, responsibility of the bidder and all other relevant factors. Any award of a contract will be made by written notification from the Cooperative.
 - a. The Cooperative reserves the right to award an order to the lowest aggregate bidder for all items or on an item basis, or a group of like items, whichever is found to be in the best interest of the Cooperative. If a split award is not acceptable to a bidder, it must be stated in the bid response.
 - b. In awarding the contract, the Cooperative may take into consideration the skill, facilities, capacity, experience, ability, responsibility, previous work, the financial standing of the bidder or bidders; the amount of other work being carried on by the bidder; the quality, efficiency, and construction of the equipment proposed to be furnished; the period of time within which the equipment is to be furnished and delivered; and the necessity of prompt delivery of the items herein described. The inability of any bidder to meet the requirement mentioned above may be cause for rejection of their bid.
6. Do not include Federal Excise Tax or Sales and Use Taxes in bid prices, as the Cooperative Member Agencies are exempt from them by law. Tax exemption certificates will be furnished if required.
7. The delivery date(s) or when work will start shall be stated in definite terms, as they will be taken into consideration in making the award.
8. Cooperative Member Agencies reserve the right to cancel all or any part of orders if delivery is not made or work is not started as guaranteed. In case of delay, the Vendor or Contractor **must** notify the Cooperative Member Agency that issued the purchase order.
9. In case of any default by the bidder, the Cooperative Member Agency may procure the product or service from other sources and hold the bidder responsible for any damages incurred including, but not limited to, excess cost or handling charge. The Cooperative shall have the right to remove any bidder who defaults on any contract with the Cooperative from all bidders' lists.



MID-MISSOURI PUBLIC PURCHASING COOPERATIVE
INSTRUCTIONS AND GENERAL CONDITIONS OF BIDDING

Sheet 3 of 25
Bid No. MM32

10. Prices must be stated in units of quantity specified, and must be firm. Bids qualified by escalator clauses may not be considered.



MID-MISSOURI PUBLIC PURCHASING COOPERATIVE
INSTRUCTIONS AND GENERAL CONDITIONS OF BIDDING

Sheet 4 of 25
Bid No. MM32

11. RECEIPT AND OPENING OF ADVERTISED SEALED BIDS:

The bidders and public are invited, but not required, to attend the formal opening of bids. Prices will be read aloud to the public. No decisions related to an award of a contract or purchase order will be made at the opening. Due to manpower limitations, the Member Agency will not repeat prices after an opening via telephone request. Bidders may contact the Member Agency office to review the bid responses.

a. It is the bidder's sole responsibility to ensure that a bid is physically deposited with the Member Agency prior to the time and the date specified. Late bids will not be opened and will be rejected unopened regardless of the degree of lateness or the reason thereto, including causes beyond the control of the bidder.

b. All bids and tabulation sheets are kept by the Member Agency for a period of time established by regulation or statute after the award is made and are available for inspection at any time during regular working hours.

12. WITHDRAWAL OF BIDS:

Bids may be withdrawn without prejudice any time before the deadline for receipt of bids. If a mistake or error is discovered by the bidder or by the Cooperative after the bid opening, the Cooperative has the right to call this error to the bidder's attention and request verifications of the bid. If the bidder acknowledges the mistake and requests relief, the Cooperative will proceed in the following manner:

a. **Clerical Mistakes:** Any mistake which is obviously a clerical one, such as an error in price extension, or in placement of decimal points, reversal or prices, etc., may be corrected by the Cooperative after verification is made by the bidder. However, the unit price shown shall always prevail.

b. **Withdrawal:** Permission to allow a bidder to withdraw his bid without prejudice may be given when clear and convincing evidence supports the existence of an error. If there is a significant and obvious disparity between the prices of the lowest bidder and of the other bidders, a bidder may be permitted to withdraw without prejudice, upon submission of evidence that a nonintentional error occurred.

Actual changes in bid pricing, terms or conditions will not be permitted after the deadline for receipt of bids.

13. The Cooperative reserves the right, when only one bid has been received by the bid closing date, to delay the opening of bids to another advertised date and time in order to revise specifications and/or establish further competition for the commodity or service required. The one (1) bid received will be returned unopened to the offeror for resubmittal at the new date and time of bid closing.

14. CONTRACTOR'S INSURANCE:

The Contractor shall not commence work under this contract until they have obtained all insurance required under this paragraph and such insurance has been approved by the City and/or the County, nor shall the Contractor allow any subcontractor to commence work on their subcontract until all similar insurance required of subcontractor has been so obtained and approved. All policies shall be in amounts, form and companies satisfactory to the City and/or the County.

15. COMPENSATION INSURANCE:

The Contractor shall take out and maintain during the life of this contract, Employees' Liability and Worker's Compensation Insurance for all of their employees unless such employees are covered by the Protection afforded by the Contractor. In case any class of employees engaged in hazardous work under this contract at the site of the work is not protected under the Worker's Compensation Statute, the Contractor shall provide and shall cause each subcontractor to provide Employee's Liability Insurance for the protection of their employees not otherwise protected.



MID-MISSOURI PUBLIC PURCHASING COOPERATIVE
INSTRUCTIONS AND GENERAL CONDITIONS OF BIDDING

Sheet 5 of 25
Bid No. MM32

16. COMPREHENSIVE GENERAL LIABILITY INSURANCE:

The Contractor shall take out and maintain during the life of this contract such comprehensive general liability insurance as shall protect them and any subcontractor performing work covered by this contract, from claims for damages for personal injury including accidental death, as well as from claims for property damages, which may arise from operations under this contract, whether such operations be by themselves or by any subcontractor or by anyone directly or indirectly employed by either of them. The amounts of insurance shall be not less than \$2,000,000.00 combined single limit for any one occurrence covering both bodily injury and property damage, including accidental death.

17. AUTOMOBILE PUBLIC LIABILITY AND PROPERTY DAMAGE:

The Contractor shall maintain during the life of this contract, automobile public liability insurance in the amount of not less than \$2,000,000.00 combined single limit for any one occurrence and not less than \$150,000.00 per individual, covering both bodily injury, including accidental death, and property damage, to protect themselves from any and all claims arising from the use of the Contractor's own automobiles, teams and trucks; hired automobiles, teams and trucks; and automobiles both on and off the site of the work.

18. OWNER'S CONTINGENT OR PROTECTIVE LIABILITY AND PROPERTY DAMAGE:

The Contractor shall provide the City and/or the County with proof of Owner's Protective Liability and Property Damage Insurance, which shall protect the City and/or the County against any and all claims which might arise as a result of the operations of the Contractor or his subcontractors in fulfilling the terms of this contract during the life of the contract. It is preferred that this policy include a provision for alleged assault and battery. The minimum amounts of such insurance will be \$2,000,000.00 per occurrence, combined single limits. Should any work be subcontracted, these limits will also apply.

19. HOLD HARMLESS AGREEMENT:

To the fullest extent not prohibited by law, Contractor shall indemnify and hold harmless the City of Columbia and the County of Boone, its directors, officers, agents and employees from and against all claims, damages, losses and expenses (including but not limited to attorney's fees), arising by reason of any act or failure to act, negligent or otherwise, of Contractor, of any subcontractor (meaning anyone, including but not limited to consultants having a contract with the contractor or a subcontractor for part of the services), or anyone directly or indirectly employed by contractor or its subcontractor, or of anyone for whose acts the contractor or its subcontractor may be liable, in connection with providing these services. This provision does not, however, require Contractor to indemnify, hold harmless or defend the City of Columbia and the County of Boone from its own negligence.

20. INDEMNIFICATION:

The Contractor shall indemnify, defend and save harmless the City and the County of Boone, its officers, agents and employees from and against any and all claims, actions, expenses, costs, damages and liability for injuries or death to persons or damage to property directly or indirectly caused by or arising from any acts or omissions of Contractor, its subcontractors, agents or employees, irrespective of any claims that an act, omission or negligence of the City and the County, its agents or employees contributed to such injury or damage.



MID-MISSOURI PUBLIC PURCHASING COOPERATIVE

GENERAL PROVISIONS

Sheet 6 of 25
Bid No. MM32

1. **BID RESPONSE:**

The Cooperative is interested in doing business with your firm. In the event you are unable to quote on this requirement, return of the bid form will indicate your desire to remain on the Cooperative's active vendor list. In addition, please indicate the reason/reasons you are unable to participate in this solicitation.

2. **BID ACCEPTANCE:**

A bid acceptance period of sixty (60) calendar days is required. Bids offering less than sixty (60) calendar days may be rejected.

3. **OSHA COMPLIANCE:**

All material or equipment furnished shall meet the minimum requirements of the Occupational Safety & Health Standard Act (OSHA) published in the Federal Register. All alleged violations and deviations from said State and Federal regulations or standards of the items or services to be furnished hereunder, must be set forth on the Bid Form at the time of submission of the bids. Or if at any later date the items or services contained herein shall not meet all applicable State and Federal requirements after the bidder is awarded the contract hereunder, the bidder must notify the Cooperative immediately by registered mail.

4. **INSPECTION AND ACCEPTANCE:**

Inspection and acceptance will be at destination. Until delivery and acceptance, or after any rejection, risk or loss shall be the responsibility of the Contractor unless loss results from negligence of the Cooperative Member issuing the purchase order.

5. **VARIATION IN QUANTITY:**

No variation in the quantity of any item called for in this contract will be accepted unless such variation has been caused by conditions of loading, shipping, or packing, or allowances in manufacturing processes, and then only to the extent, if any, specified elsewhere in this contract.

6. **COMMERCIAL WARRANTY:**

The Contractor agrees that the supplies or services furnished under this contract shall be covered by the most favorable commercial warranties the Contractor gives to any customer for such supplies or services and that the rights and remedies provided herein are in addition to and do not limit any rights afforded to the Cooperative by any other clause of this contract or by law.

7. **DISCOUNTS:**

Discount time will be computed from date of delivery at place of acceptance or from receipt of correct invoice at the office specified by the order, whichever is later. For discount purposes, payment is made when the check is mailed. Discounts will not be taken into consideration in the evaluation process if the payment discount is less than 30 days.

8. **PATENT AND COPYRIGHT:**

a. The Contractor and its Surety shall pay for all royalties, license fees, and patent or invention rights or copyrights and defend all suits or claims for infringements of any part or invention right or copyrights involved in the items furnished hereunder.

b. The Contractor and its Surety shall hold and save the Cooperative and its officers, agents, servants, and employees harmless from liability of any nature or kind, including cost and expenses for, or on account of, any patented or unpatented invention, process, article, or appliance furnished in the performance of the contract, including its use by the Owner, unless otherwise specifically stipulated.

9. **DISPUTES:**

If any dispute concerning a question of fact arises under this contract, other than termination for default or convenience, the Contractor and Cooperative Member Agency responsible for administration of this contract shall make a good faith effort to resolve the dispute. If the dispute cannot be resolved by agreement, then the Cooperative shall resolve the dispute and send a written copy of its decision to the Contractor and the responsible agency.



MID-MISSOURI PUBLIC PURCHASING COOPERATIVE

GENERAL PROVISIONS

Sheet 7 of 25
Bid No. MM32

10. **TERMINATION FOR DEFAULT:**

The Cooperative may, by written notice, terminate this contract in whole or in part for failure of the Contractor to perform any of the provisions thereof. In such event, the Contractor shall be liable for damages, including the excess cost of reprocurring similar supplies or services; provided, that if (a) it is determined for any reason that the contractor was not in default or, (b) failure to perform is beyond the Contractor's or subcontractor's control, fault or negligence, the termination shall be deemed to be a termination for convenience. Termination shall be effective ten (10) days from the Contractor's receipt of notice.

11. **TERMINATION FOR CONVENIENCE:**

The Cooperative may, by written notice, terminate this contract in whole or in part when it is in the best interest of the Cooperative. If this contract is for supplies and is to be terminated, the Contractor shall be compensated in accordance with his auditable costs to point of notification of termination. To the extent that this contract is for services and is so terminated, the Cooperative Member Agencies shall be liable only for payment in accordance with the payment provisions of this contract for services rendered to the effective date of termination. Termination shall be effective ten (10) days from the Contractor's receipt of notice unless a longer time period is provided in the notice.

12. **TERM & SUPPLY CONTRACT DEFINED:**

A term and supply contract shall be deemed to mean a contract under which the supplier of articles, commodities, supplies materials, equipment, and services agrees to furnish all of the needs of the various Cooperative Member Agencies for the articles, commodities, supplies, materials, equipment, and services set forth in the quotation, during the period of the contract at the unit price bid and as required from time to time by the Member Agencies, be such needs in excess of or less than the estimated quantities set forth in the Request for Quotation. The contract will provide that the Cooperative Member Agencies will purchase, by issuance of Purchase Orders, such articles commodities, supplies, materials and equipment solely from the supplier of whom the requirement contract is awarded for the contract term.

13. **FUND ALLOCATION:**

Continuance of any resulting agreement, contract or issuance of purchase orders after a Cooperative Member Agency's fiscal year end is contingent upon the allocation of funds for the next proceeding fiscal year.

14. **OFFICIALS NOT TO BENEFIT:**

No regular employee or elected or appointed member of any Cooperative Member Agency shall be admitted to any share or part of this contract, or to any benefit that shall arise therefrom; but this provision shall not be construed to extend to this contract if made with a corporation for its general benefit.

15. **HAZARDOUS MATERIAL:**

When material furnished is hazardous material as defined by D.O.T. regulations, the following certification must be made on the bill of lading: "This is to certify that the above named articles are properly classified, described, packaged, marked and labeled and are in proper condition for transportation according to applicable regulations of the Department of Transportation."

16. **DOMESTIC PRODUCTS:**

Bidders are encouraged to offer products manufactured, assembled or produced in the United States if the quality and price are comparable with other goods.

The Mid-Missouri Public Purchasing Cooperative has adopted a policy which is binding upon all members of the cooperative, and which by the contractor shall be binding upon independent contractors and subcontractors with the Cooperative, whereby all other things being equal and when the same can be secured without additional cost over foreign products, or products of other states, a preference shall be granted in all construction, repair, and purchase contracts, to all products, commodities, materials, supplies, and articles mined, grown, produced, and manufactured in marketable quantity and quality in the State of Missouri, and to all firms, corporations, or individuals doing business as Missouri firms, corporations, or individuals.

17. **RECYCLED PRODUCTS:**

All bidders who wish to receive consideration on products offered with recycled materials content must properly complete, sign, and return a certification of product content with their bid.



MID-MISSOURI PUBLIC PURCHASING COOPERATIVE

GENERAL PROVISIONS

Sheet 8 of 25
Bid No. MM32

18. **EQUAL OPPORTUNITY:**
Members of the Cooperative are equal opportunity affirmative action employers pursuant to federal and state law, and all respondents submitting bids shall be considered to be EEO/AA employers in compliance with federal and state laws, unless otherwise stipulated by the bidders herein.
19. **AMERICANS WITH DISABILITIES ACT:**
The successful contractor agrees to comply with all applicable provisions of the Americans with Disabilities Act and the regulations implementing the Act, including those regulations governing employment practices.

If this contract involves the contractor providing services directly to the public, the successful contractor shall make services, programs and activities governed by this agreement accessible to the disabled as required by the Americans with Disabilities Act and its implementing regulations. Payment of funds under this agreement is conditional upon the successful contractor certifying to the Cooperative in writing that it is complying with the Americans with Disabilities Act and 28 CFR Part 35.
20. **OBLIGATION OF BIDDER TO DBE's:**
It is desirable that businesses owned by socially and economically disadvantaged individuals (DBE's) as defined in 49 CFR part 23 have the maximum opportunity to participate in the performance of this contract. The successful bidder shall agree to insure that DBE's have been given the maximum opportunity to participate in the performance of this contract and any subcontract. In this regard the bidder shall take all necessary and reasonable steps to insure that DBE's have the maximum opportunity to compete for and perform within this contract. The bidder shall not discriminate on the basis of race, color, age, national origin, or sex in the performance of this contract or the award of any subsequent subcontract



MID-MISSOURI PUBLIC PURCHASING COOPERATIVE

TECHNICAL SPECIFICATIONS for PHASE I:

DIGITAL ORTHOPHOTOS

Sheet 9 of 25
Bid No. MM32

A. **AERIAL PHOTOGRAPHY:**

1. Project Area and County Contract Map:

The locations, size and boundaries of the areas to be mapped are outlined on the "County Contract Map" and further subdivided and designated in a way to show the number and scales of the final digital orthophotos to be prepared. This marked County map is entitled the "County Contract Map" and is attached to and made part of the contractual agreement.

2. Conditions During Photography:

Vertical aerial photography will be accomplished during the period when deciduous trees are barren and when the sun angle is not less than 30 degrees. Photography will not be undertaken when the ground is obscured by snow, haze, fog or dust; when streams are not within their normal banks; when clouds or cloud shadows will appear on more than 5 percent of the area in any one photograph. The photographs will not contain objectionable shadows caused by relief or low solar altitude. In addition to the above stated "Conditions During Photography", the Aerial Photography flight must be completed during the Spring Equinox.

3. Targeting Existing Horizontal Control Points:

Approved targets will be used to mark horizontal control points for aerial triangulation and control of base map compilation. The horizontal control points that are to be targeted are shown on the "Geographic Reference System Diagram" and are attached to and made a part of the contractual agreement. All horizontal ground control will be based on NAD83 Missouri Central 2402 State Plane Coordinates, U.S. Survey Feet.

The placing of targets is a contractual alternate and shall be included as a separate item in the cost proposal. The County will make the choice when the contract is signed. If the County chooses to place the targets with its own personnel or with a separate contract, the mapping contractor shall provide the County with the required size of target and a proposed flight date. This information shall be provided at least two weeks prior to flying.

If the Contractor deems that additional control (more than that shown on the Geographic Reference System Diagram) is necessary to achieve the required accuracy for the digital orthophoto mapping, this shall be included as a separate item in the cost proposal.

4. Photographic Coverage:

Aerial photography shall be secured based on the intended use of photographs as stated in the contract.

Forward overlap in the line of flight shall average not less than 57% or more than 62% at the mean elevation of the terrain, unless otherwise specified. Individual forward overlaps shall not be less than 55% or more than 68%, excepting the situation where in a forward overlap in areas of low elevation must exceed 68% to attain the minimum 55% forward overlap in adjacent areas of higher elevation.

Wherever there is a change in direction between two flight lines (other than between adjacent parallel flight lines) junction areas between the adjoining flight lines shall be covered stereoscopically by both lines.

Side Overlap between adjacent parallel flight lines shall be 30% +/- 100% at the mean elevation of the terrain. In addition, any point on the flight line as flown shall not deviate from the flight plan location by a distance greater than 10% of the width of coverage of the photograph.

Departures from flight heights required to produce the desired photo scale shall not exceed -2% or +5% unless changed by Air Route Traffic Control Centers.

Changes in the course of the aircraft between successive overlapping photographs within a flight line shall not exceed 3 degrees.



MID-MISSOURI PUBLIC PURCHASING COOPERATIVE

TECHNICAL SPECIFICATIONS for PHASE I:

DIGITAL ORTHOPHOTOS

Sheet 10 of 25
Bid No. MM32

While exposing aerial photography, the camera shall be compensated for crab of the aircraft, with resultant error not exceeding 3 degrees.

The tilt within a single frame shall not exceed 4 degrees nor shall the difference in tilt between two consecutive overlapping frames within a flight line exceed 4 degrees. The average tilt for all negatives of the same nominal scale shall not exceed 1 degree.

The combined effect of aircraft course corrections, crab and tilt shall result in an apparent crab not greater than 5 degrees on successive photography.

Apparent crab is defined as the angle between a line joining fiducial marks in the direction of flight and the line between the indicated principal point and the conjugate image of the indicated principal point of the adjacent photograph within the same line of flight.

Exposure of the film shall be in accordance with the manufacturer's recommendations. The negatives shall be clear and sharp in detail, free from light streaks and static marks, and of uniform tone and degree of contrast to permit ground details to show clearly in all scene reflectance, with particular emphasis on pattern recognition in the shadow areas.

All film shall be exposed using the fastest shutter speed possible when the aperture is set at its optimum value in consideration of the optical resolution and image motion.

5. Camera and Associated Equipment:

This section refers to aerial cameras of nominal focal length of 152 mm with format dimensions of 230 x 230 mm only.

A metric quality survey camera shall be used, fitted with a lens that is designed to give an absolute radial distortion not exceeding 15 micrometers within 100 mm of the principal point. The film shall be held in the intended image plane during exposure to maintain sharp focus and hold image distortion to less than that, which will produce 20 microns of y-parallax after relative orientation anywhere in the model.

The lens shall be corrected for the spectral range of the film used.

Each camera lens unit shall have been calibrated, tested and certified by the camera manufacturer or by a calibration center, recognized internationally or approved by the camera manufacturer. The certificate shall show that the camera has been calibrated within three years of completion of the photography. However, when there is any reason to believe the dimensional relationship of the lens, fiducial marks, and film plane have been disturbed by partial disassembly or unusual mechanical shock, the camera must be submitted for recalibration at the contractors expense.

The camera will be equipped with Forward Motion Compensation (FMC) and it is recommended the camera have a gyro-stabilized mount system.

6. Aerial Film and Image Quality:

The black and white aerial film shall be fine grain, high speed photographic emulsion on a dimensionally stable polyester base. Only one type of film shall be used for the entire project. Outdated film shall not be used.

The imagery on the aerial film shall be clear and sharp and evenly exposed across the format. The exposed film shall be free from clouds, cloud shadows, smoke, haze, snow, shadows, crimps, scratches and any other blemishes, which interfere with the intended



MID-MISSOURI PUBLIC PURCHASING COOPERATIVE

TECHNICAL SPECIFICATIONS for PHASE I:

DIGITAL ORTHOPHOTOS

Sheet 11 of 25
Bid No. MM32

purpose of photography. Allowances will be made for unavoidable shadows, permanent snow fields, or reflectance from water bodies. If the imagery is obviously degraded, the original film shall be rejected for poor image quality and reflowed.

The exposed/processed aerial film will be the property of the County and may be maintained by the contractor in accordance with the contract. The contractor, as an aid for the quality control inspection should also maintain all flight maps used for the acquisition.

Each processed roll or partial roll of aerial film shall be kept in roll form, on the spool, and in the metal or plastic container supplied by the film manufacturer. Rejected exposures shall not be removed from any roll.

7. Contact Prints of Aerial Photography and Optional Photo Index:

Two sets of contact prints shall be made on double-weight, semi-matte paper or equivalent weight resin-coated paper. Within two weeks of the photo date and prior to any map compilation, one set of prints shall be delivered to the County for a quality control inspection. The second set shall be used to identify control points.

The control points shall be marked, numbered and pin-pricked on the face of the photo and described, by number, on the back of the photo.

If photo indexes are required, they shall be delivered to the County in accordance with the contractual stipulations of delivery schedule and delivery address.

The photo index shall be assembled from positive photographic prints made from the accepted aerial photos. The prints shall be trimmed without removing the fiducial marks. The prints shall be matched by overlapping corresponding images along the flight line. The prints for each adjacent flight line shall overlap in the same direction. Air base lengths shall be averaged in the course of matching successive pairs of photographic images along the flight line. Adjoining flight line assemblies shall be adjusted in length, until all adjacent flight strip images can be matched as completely as is practicable throughout the entire project area. Upon completion, the assembly shall show clearly the labeling of each photograph.

The roll number of the film and the exposure number on every tenth (10th) photograph as well as the first and last exposure on each line of each index sheet shall be accentuated by the use of a narrow, short, strip overlay of white paper on which the appropriate numbers have printed. The flight line number shall be prominently accentuated at each end of each strip of photographs on each index sheet. All overlay lettering and numbering shall be neat and legible on both the index assembly and its photographic copies, and shall not interfere with the principal map features or with the symbols, nomenclature and numbers which are not accentuated on the individual photographs.

A title/legend shall be included on each photo index sheet including the following information; Project designation, period of photography, scale of index (graphic scale), scale of photography, indication of North, aerial camera type and focal length, owner's name, vendor's name, approximate geographical or grid coordinates of center of project.

8. Scale of Aerial Photographic Negatives:

The altitude above average ground elevation for aerial photography shall be such that the negatives will be at the scale specified in the following schedule:

Map Scale	Negative Scale
1"=400'	1"=1666'
1"=200'	1"=833'
1"=100'	1"=833'



MID-MISSOURI PUBLIC PURCHASING COOPERATIVE

TECHNICAL SPECIFICATIONS for PHASE I:

DIGITAL ORTHOPHOTOS

Sheet 12 of 25
Bid No. MM32

B. HORIZONTAL AND VERTICAL GROUND CONTROL:

1. Horizontal ground control will be based on 1st order stations published by the Land Survey Program of DNR and/or the National Geodetic Survey NOAA.
2. All horizontal ground control will be based on NAD83 Missouri Central 2402 State Plane Coordinates, U.S. Survey Feet.
3. Vertical control will be based on NAVD 1988 elevations.
4. A minimum of three existing 1st order ground control stations, in the project area shall be targeted.
5. The county shall be given the opportunity to establish and target additional permanent horizontal ground control stations before aerial photography is taken. These ground control monuments are to serve as a basis for accuracy checking and for georeferencing cadastral survey and infrastructure overlays.

C. ANALYTICAL TRIANGULATION:

Densification and extension of field control by aero-triangulation will be permitted only by fully analytic aero-triangulation methods. The contractor shall when requested and upon completion of all aerial triangulation submit a report showing:

1. All misclosures at ground control points.
2. Computed coordinates of all control points, pass points, checkpoints and drop points if any.

D. SCANNING:

1. The device used for scanning shall be a precision instrument designed for photogrammetric applications having an aperture capable of producing a scanning resolution of at least 7 microns; a geometric accuracy of 5 microns RMSE; and a capability of resolving 256 levels of gray.
2. Original aerial negatives will be scanned. Recommended final output pixel resolution for each scale shall be as follows:

1"=400' scale orthophotos	2 feet
1"=200' scale orthophotos	1 foot
1"=100' scale orthophotos	0.5 foot

Initial scanning resolution for each scale shall be finer (smaller) than the final output pixel resolution for that scale orthophoto.

E. DEM DEVELOPMENT:

1. The DEM captured for this project shall be used to support orthophoto production.
2. The vertical accuracy of the standard DEM shall be sufficient to obtain the required horizontal accuracy.

The DEM shall consist of a combination of the following points spaced at regular intervals along a grid; points of significant high or low elevation; and break lines at significant terrain variations. It is expected that minimum grid spacing and standard break line features be consistent throughout the project.



MID-MISSOURI PUBLIC PURCHASING COOPERATIVE

TECHNICAL SPECIFICATIONS for PHASE I:

DIGITAL ORTHOPHOTOS

Sheet 13 of 25
Bid No. MM32

F. RECTIFICATION:

Image brightness shall be represented by 256 levels of gray ranging from 0 (black) to 255 (white). All intermediate values shall represent shades of gray varying uniformly from black to white. There shall be no areas of an orthophoto where the process was incomplete due to image gaps or lack of data.

All digital orthophotos shall be radiometrically adjusted as necessary so that adjacent digital orthophotos can be displayed simultaneously without an obvious visual edge seam between them. Localized adjustment of the brightness values shall be performed to minimize tonal differences between the join areas. For this adjustment, the orthophoto judged by visual inspection to have the better contrast shall be used as the reference orthophoto. Localized brightness values of the adjacent orthophoto shall be adjusted to that of the reference orthophoto. When possible and feasible, the area adjusted should be bounded by a tonal break ground feature such as a road, field line, shadow line, etc. The radiometric adjustment should not compromise the accuracy, clarity or the resolution to the orthophoto.

Prior to the undertaking full digital orthophoto production, the contractor shall furnish the county with sample digital orthos at each production scale to evaluate and accept as examples of overall quality. The county will select one ortho at each scale that will become the standard to which all subsequent digital orthophotos will be compared for acceptance or rejection relative to quality.

1. The rectification process shall involve solution of the appropriate photogrammetric equations for each pixel in the output image. It will not be permissible to solve photogrammetric equations at anchor points only and then war the content of the original image between the anchor points.

2. DEM data used to correct displacement shall be sufficiently accurate to ensure the image meets map accuracy standards for the intended scale. The contractor shall use elevation data with appropriate ground sample distances and area coverage to reliably describe the terrain and obtain the required mapping accuracy.

G. MAP ACCURACY:

1. The accuracy of all base maps shall be measured and reported in accordance with the National Standard For Spatial Data Accuracy FGDC-STD-007.3-1998.

2. All Orthophoto Base Maps shall be labeled as follows:

THIS ORTHOPHOTO BASE MAP WAS COMPILED TO MEET THE ASPRS/MO. MAP ACCURACY STANDARD FOR CLASS 2 OR BETTER

OR

THIS ORTHOPHOTO BASE MAP WAS CHECKED AND FOUND TO CONFORM TO THE ASPRS/MO. MAP ACCURACY STANDARD FOR CLASS 2 OR BETTER

3. All base maps shall meet the accuracy requirements for Class 2 or better of the Missouri Mapping Standards 10 CSR 6.020 or the American Society for Photogrammetry and Remote Sensing (ASPRS)-Accuracy standards for Large Scale Maps.

Horizontal Accuracy (95% confidence level)

Map Scale	Class 1	Class 2
1"=100'	2.4 ft.	4.9 ft.
1"=200'	4.9 ft.	9.8 ft.
1"=400'	9.8 ft.	19.6 ft.
1"=1000'	24.5 ft.	48.9 ft.

Note: Accuracy = 2.447* RMSE for large samples.



MID-MISSOURI PUBLIC PURCHASING COOPERATIVE

TECHNICAL SPECIFICATIONS for PHASE I:

DIGITAL ORTHOPHOTOS

Sheet 14 of 25
Bid No. MM32

H. **DIGITAL DATA FILES:**

The digital raster files of orthophoto sheets will be delivered on CD in a TIFF-8-bit format suitable for use in a CAD or GIS environment. The data will include the TIFF world files for georeferencing the raster data. The CD will be accompanied by a report and/or label that specifies the name of each file, the size of each file, the map number of each map on the CD, and the name of the Contractor. Map index shall be provided in ESRI shapefile format with associated labels that specifies the name of each file, the size of each file, the map number of each map on the CD, and the name of the Contractor.

Optional digital file format may be requested (MrSid). If requested this file should be seamless.

Digital Aerial Photography files shall be tiled to match the sections delineated on the County Contract Map - Option 1/Option2/Option3/Option4 (whichever is selected). All digital files shall be edgematched with no gaps or overlap.

I. **DELIVERABLE ITEMS:**

1. Two complete sets of all Digital Aerial Files pertaining to the project on CD ROMs (Images should be delivered in TIFF format)
2. Two sets of contact prints as specified.
3. Photo index in ESRI Shapefile format.
4. Control and aero triangulation report.
5. Ground Control Information - Index maps in digital format (Shapefile) the recovered/established control points.
6. DEM/DTM files developed to produce the orthophotography.

All digital files will be delivered on CD ROMs

J. **DOCUMENTS INCLUDED WITH THIS BID PACKET:**

1. Contract or agreement.
2. Mapping Standards per this specification.
3. County contract maps.
4. Geographic Reference System Diagram.
5. Technical Specifications per this specification.



MID-MISSOURI PUBLIC PURCHASING COOPERATIVE

TECHNICAL SPECIFICATIONS for PHASE II:

DIGITAL PLANIMETRIC AND TOPOGRAPHIC MAPPING

Sheet 15 of 25
Bid No. MM32

A. WORK STATEMENT:

The purpose of the work under this section is to contract for the procurement of digital topographic and planimetric mapping for the areas shown on PHASE II County Contract Map, in addition to acquiring a complete set of digital aerial imagery described in Section I of this request for proposals. The contractor shall furnish the materials, supervision, labor, equipment, and transportation, and shall execute and complete all of the work required by the contract in conformance with these specifications.

For the purpose of Stormwater Master Planning, the City of Columbia is participating with the Boone County Tax Assessor to develop topographic/planimetric maps of the approximate 171 square mile area surrounding the Columbia Metropolitan Planning Boundary and the approximately 12 square mile area outlining the Columbia Regional Airport as shown on PHASE II County Contract Map. It is the City's goal to use imagery obtained from the County Assessor's aerial mapping project, described in Section I, to generate the topographic/planimetric data in these areas. In areas where the County Assessor's specified aerial mapping scales do not meet the requirements needed for the generation of topographic/planimetric data as specified herein, it is the City's intent to structure bids so that all additional costs associated with the generation of the topographic/planimetric maps that are in excess of those costs associated with the County Assessor's requirements can be identified, separated, and paid separately by the City of Columbia.

B. AERIAL PHOTOGRAPHY:

1. Aerial photography shall meet all specifications of the Boone County Tax Assessor as presented in Section I of this request for proposals except as noted.
2. In areas where aerial mapping scales specified by the County Assessor in Section I of this document do not meet the requirements for mapping the specified topographic/planimetric data requested by the City, the contractor shall propose a photo scale and flight height sufficient to meet Class 2 - ASPRS Map Accuracy Standards for Large-Scale Maps for mapping two-foot contours at a scale of 1" = 100'.
3. In areas where the specifications for topographic/planimetric mapping require larger scale aerial photos than specified by the County Assessor in Section I of this document, photo deliverables for these areas shall include 0.5-foot pixel resolution digital imagery meeting Class 2 - ASPRS Map Accuracy Standards for 1" = 100' scale mapping.

C. PROJECT PHASING:

Funding for Phase II (topographic and planimetric mapping) is contingent upon approval of a Missouri DNR Stormwater Grant. It is anticipated grant funding for this work will be in place by mid-May of 2002. The contractor will be notified of whether to proceed with the completion of Phase II (topographic and planimetric mapping) by July 1, 2002.

D. GROUND CONTROL:

The City of Columbia shall provide all horizontal and vertical ground control required for the proposed topographic/planimetric mapping project. All horizontal ground control will be based on NAD83 Missouri Central 2402 State Plane Coordinates, U.S. Survey Feet. After determination of the required flight lines and altitude, the photogrammetric contractor will have the City target all necessary control prior to the photo mission, provided 2-weeks advance notice is provided to the City Land Surveyor.

E. ANALYTICAL TRIANGULATION:

Fully Analytical Aerial Triangulation shall be utilized to establish precise relationships between the individual aerial photo systems and the defined datum and projection. The results of this process shall be used to densify existing ground controls sets, reducing the amount of control needed to be established by the City, and providing a method of checking the horizontal and vertical control provided.

F. TOPOGRAPHIC MAPPING:

Cartographically complete and topologically correct 2-foot contours and spot elevations to Class 2 - ASPRS Accuracies for Large Scale Maps are to be developed by the photogrammetric contractor. All contours are to be mapped regardless of topography. In densely wooded areas where heavy brush or tree cover obscures the ground, the contours should be shown as dashed lines, developed



MID-MISSOURI PUBLIC PURCHASING COOPERATIVE

TECHNICAL SPECIFICATIONS for PHASE II:

DIGITAL PLANIMETRIC AND TOPOGRAPHIC MAPPING

Sheet 16 of 25
Bid No. MM32

from the stereoscopic model, while making full use of the spot elevations measured photogrammetrically in places where the ground is visible. Index contours shall be labeled on a 10-foot interval.

Spot elevations should be shown in their proper positions to show lake and pond water levels; on hilltops and ground depressions; at the sags, crests, and intersections of well traveled roads; on bridge decks and dams; and similar locations. Spot elevations should also be used to better define the topographic surface when the terrain is flat and contours are widely spaced.

G. PLANIMETRIC MAPPING:

Position of Planimetric features shall comply with ASPRS Accuracy Standards for Large-scale Class 2 Maps. Annotation and titling will be optimized for 1"=100' topographic maps. Planimetric mapping should be in accordance with standard topographic mapping procedures and should show general planimetric and cultural features including, but not limited to:

1. Edge of Paved & Unpaved Roads, Railroads and Runways
2. Retaining Walls and Bridges
3. Hydrography, including intermittent streams defined by contours
4. Towers, Masts, and other large structures.
5. Buildings footprints over 20' on one side
6. Edge of wooded areas
7. Paved parking lots
8. Property fence lines not parallel highways of streets
9. Street and stream names
10. Sidewalks will **NOT** be delineated.

H. DELIVERABLES:

1. DEM/DTM files developed to produce the topographic maps.
2. AutoCAD 2000 files of the Planimetric/Topographic maps tiled into one hundred and seventy-five (175) individual DWG files. Paneling of drawing files should be based approximately on the PLSS sections and edge matched with no overlap buffer. Contours are to be produced in 3D with proper elevations assigned to each polyline.
3. Seamless Topographic/Planimetric coverages of the entire City proposed area shown on County Contract Map - Option 3/Option4, excluding the Columbia Regional Airport, in ESRI shapefile format. Shapefiles of the planimetric features identified in Section F should be provided for the for the City proposed area shown on County Contract Map - Option 3/Option4, excluding the Columbia Regional Airport. Contours in shapefile format shall be assigned proper elevation attribute data.
4. All digital files will be delivered on CD ROMs.



MID-MISSOURI PUBLIC PURCHASING COOPERATIVE

VENDOR RESPONSE SHEET

Sheet 17 of 25
Bid No. MM32

**RESPOND TO ALL ITEMS LISTED ON VENDOR RESPONSE SHEET
MMPPC WILL ONLY AWARD 1 OPTION**

Base Bid:

Aerial Photography – Contours – Planimetrics

Total square miles = 691

Option 1 – County Alone – 1”=100’ & 1”=200’ & 1”=400’

A. PHASE I

1.	Cost for	131	sqmi	-	1”=100’	Orthophotography	\$ _____
2.	Cost for	96	sqmi	-	1”=200’	Orthophotography	\$ _____
3.	Cost for	464	sqmi	-	1”=400’	Orthophotography	\$ _____
Total							\$ _____

Option 2 – County Alone – 1”=100’ & 1”=200’

A. PHASE I

1.	Cost for	131	sqmi	-	1”=100’	Orthophotography	\$ _____
2.	Cost for	560	sqmi	-	1”=200’	Orthophotography	\$ _____
Total							\$ _____

Option 3 – County and City – 1”=100’ & 1”=200’ & 1”=400’

A. PHASE I

1.	Cost for	200	sqmi	-	1”=100’	Orthophotography	\$ _____
2.	Cost for	81	sqmi	-	1”=200’	Orthophotography	\$ _____
3.	Cost for	410	sqmi	-	1”=400’	Orthophotography	\$ _____

B. PHASE II

1.	Cost for	183	sqmi	-	2’ Contours		\$ _____
2.	Cost for	183	sqmi	-	Planimetrics		\$ _____
Total							\$ _____

Option 4 – County and City – 1”=100’ & 1”=200’

A. PHASE I

1.	Cost for	200	sqmi	-	1”=100’	Orthophotography	\$ _____
2.	Cost for	491	sqmi	-	1”=200’	Orthophotography	\$ _____

B. PHASE II

1.	Cost for	183	sqmi	-	2’ Contours		\$ _____
2.	Cost for	183	sqmi	-	Planimetrics		\$ _____
Total							\$ _____

Alternate Bids:

Ground Control

Option 1 – (Excludes 183 sqmi area surrounding the City of Columbia)
Cost for 508 sqmi Ground Control \$ _____

Optional digital file format

Option 1 – MrSid \$ _____



MID-MISSOURI PUBLIC PURCHASING COOPERATIVE

VENDOR RESPONSE SHEET

Sheet 18 of 25
Bid No. MM32

Additional Charges (if any) – List any additional charges below – Attach supporting documentation, if necessary.

_____	\$ _____
_____	\$ _____
_____	\$ _____
_____	\$ _____
_____	\$ _____
_____	\$ _____
	Total \$ _____

Delivery Dates

1. Estimated date of Aerial flight _____
2. Estimated delivery date for PHASE I (Orothopoto maps) _____
3. Estimated days to complete PHASE II (topographic / planimetric maps) _____

VENDOR QUALIFICATIONS - Attach supporting documentation

The Vendor Qualifications section of the RFQ must consist of the following subsections:

1. Bidder Identification and Information
2. Office Location
3. When Organized/When Incorporated
4. Contract Performance
5. Bidder's Qualifications and Experience
6. Staff Qualifications
7. Subcontracts/Subcontractors

VENDOR REFERENCES - Attach supporting documentation

List of at least 4 references including:

1. Company
2. Contact Name
3. Phone Number

Authorized Representative Signature: _____

Print Name and Title of Authorized Representative

Date

Phone #: _____

FAX #: _____



MID-MISSOURI PUBLIC PURCHASING COOPERATIVE

VENDOR RESPONSE SHEET

Sheet 19 of 25
Bid No. MM32

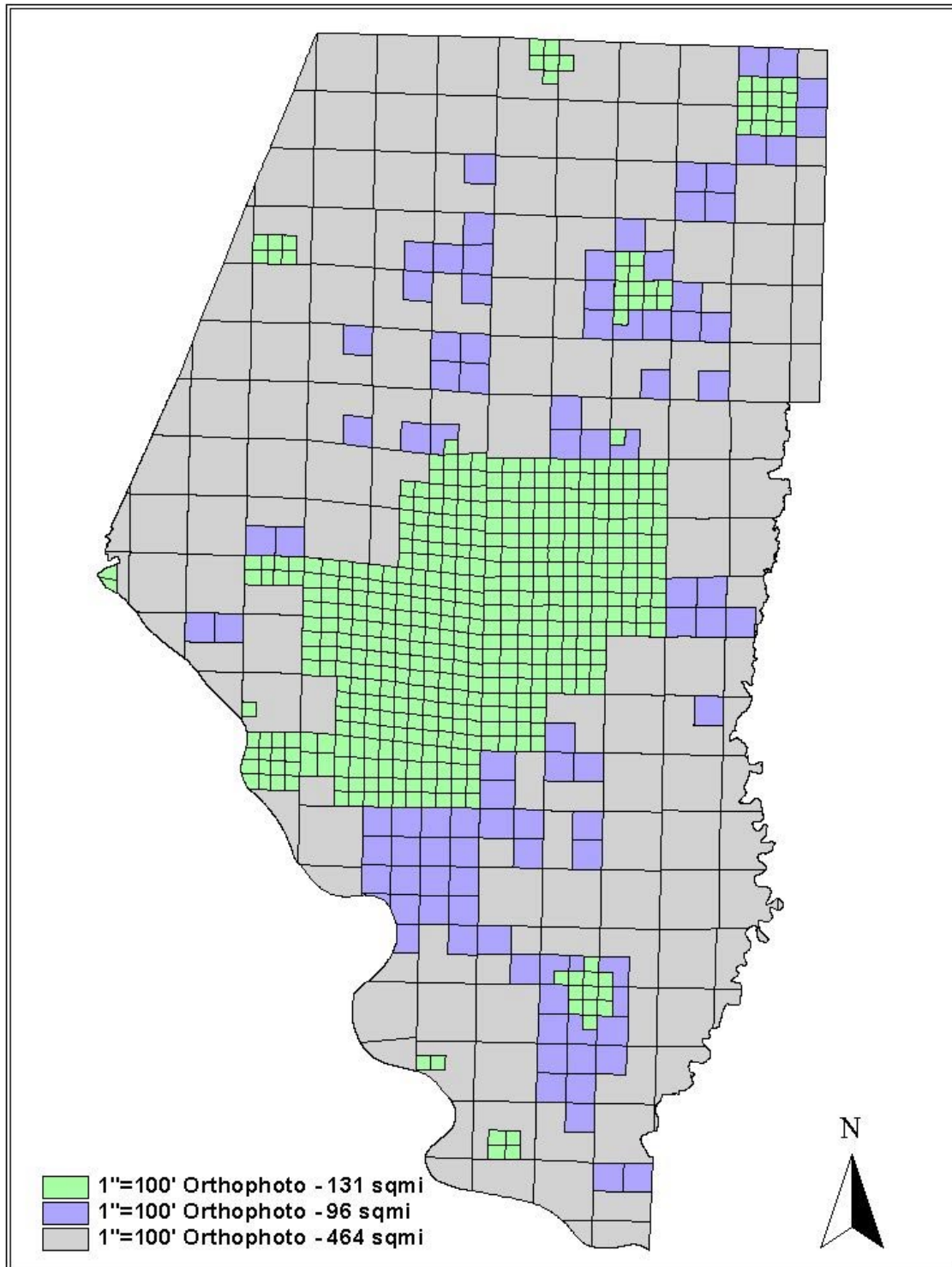
MMPPC Form No. 9402 (3/94)



MID-MISSOURI PUBLIC PURCHASING COOPERATIVE

PHASE I County Contract Map - Option 1

Sheet 20 of 25
Bid No. MM32

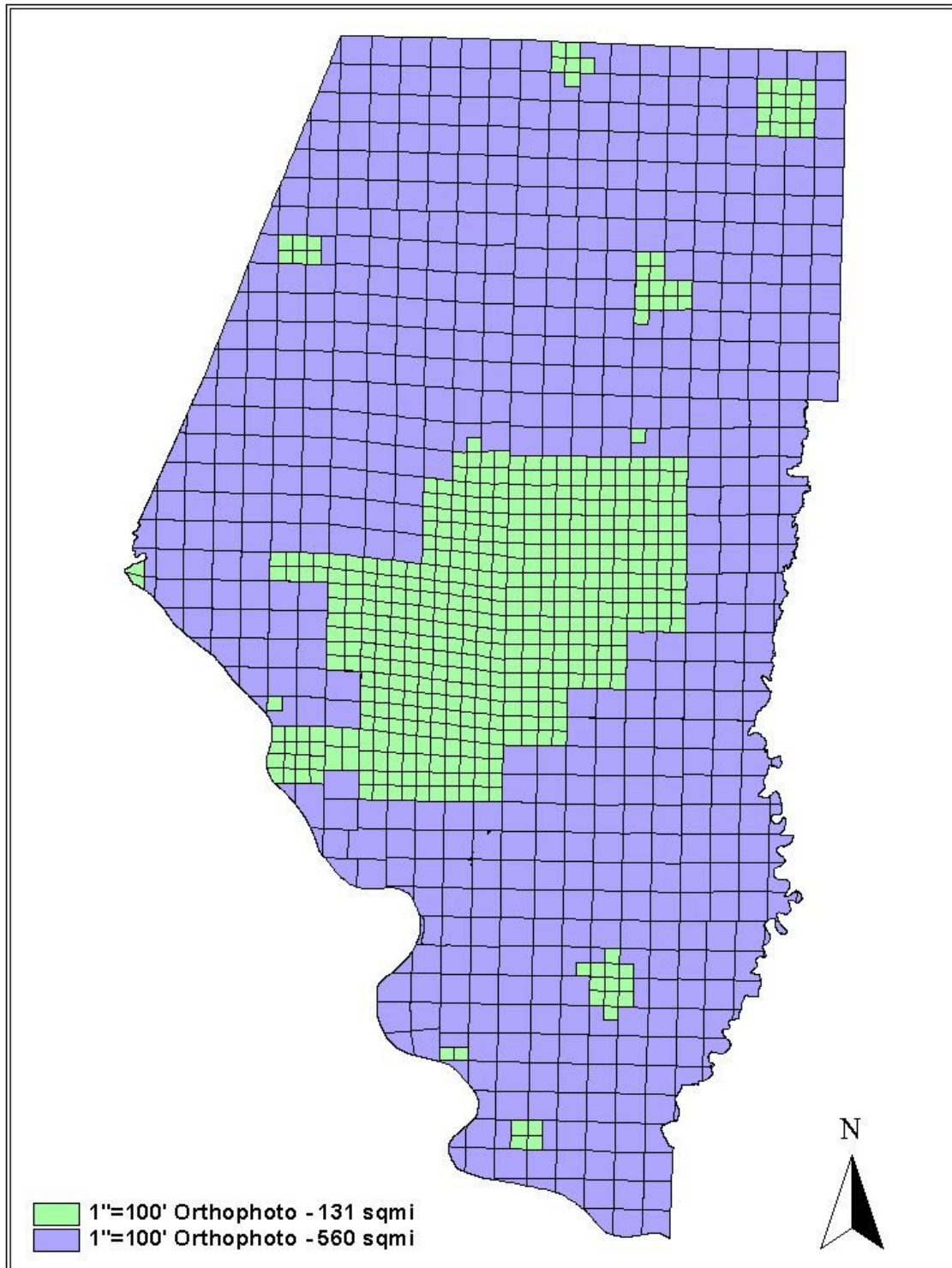




MID-MISSOURI PUBLIC PURCHASING COOPERATIVE

PHASE I
County Contract Map - Option 2

Sheet 21 of 25
Bid No. MM32

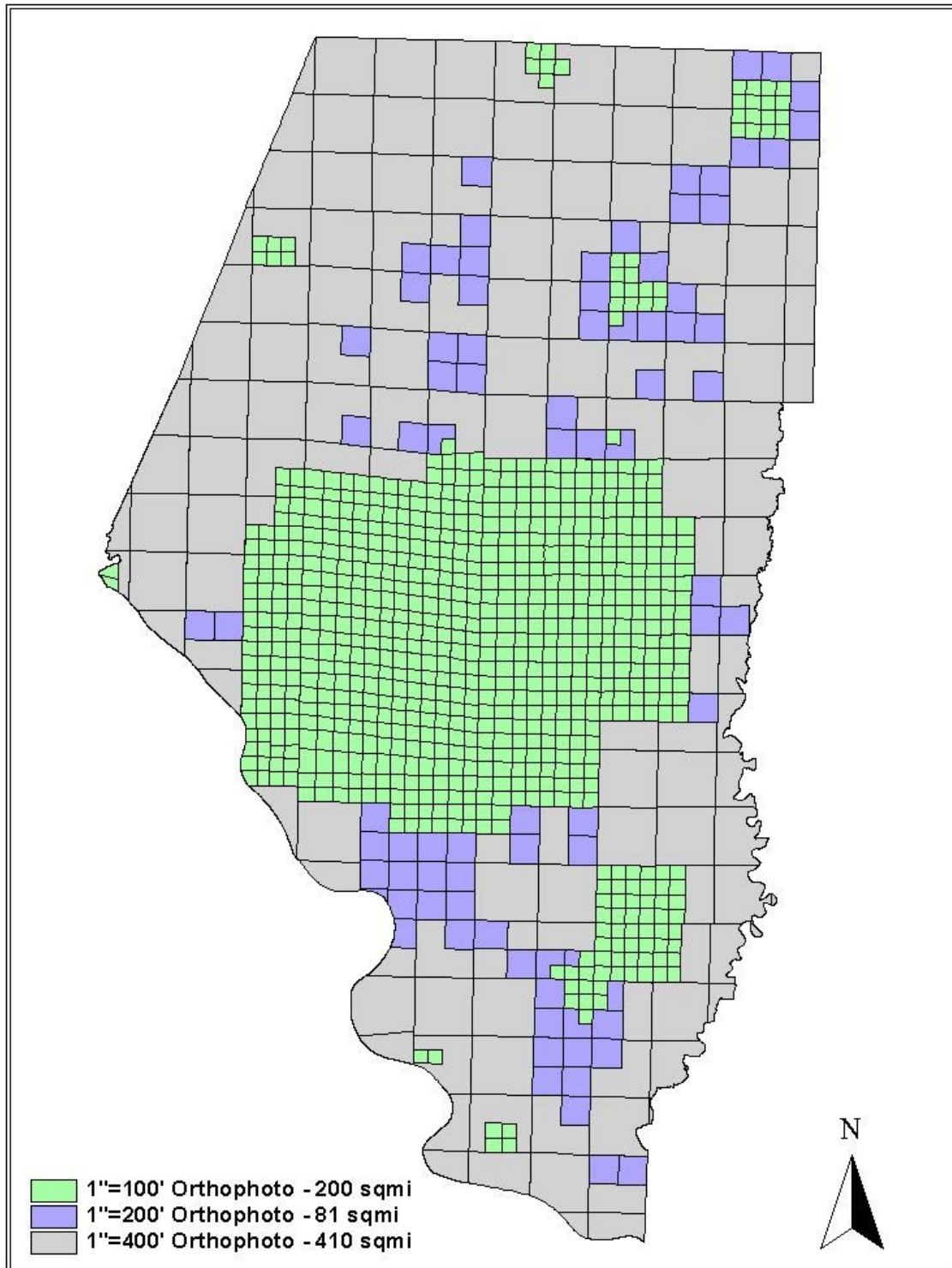




MID-MISSOURI PUBLIC PURCHASING COOPERATIVE

PHASE I County Contract Map - Option 3

Sheet 22 of 25
Bid No. MM32

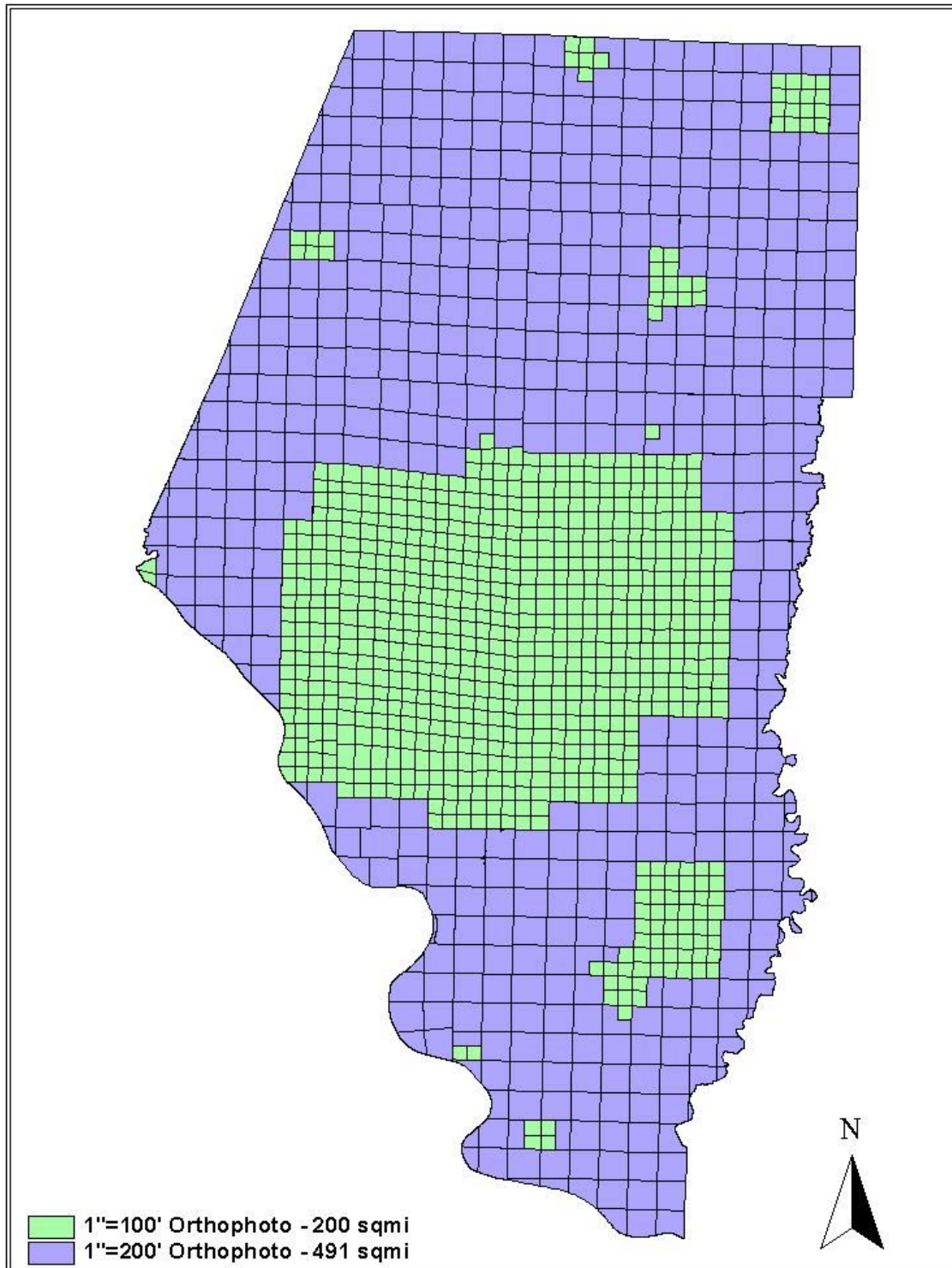




MID-MISSOURI PUBLIC PURCHASING COOPERATIVE

PHASE I County Contract Map - Option 4

Sheet 23 of 25
Bid No. MM32



1"=100' Orthophoto - 200 sqmi
1"=200' Orthophoto - 491 sqmi

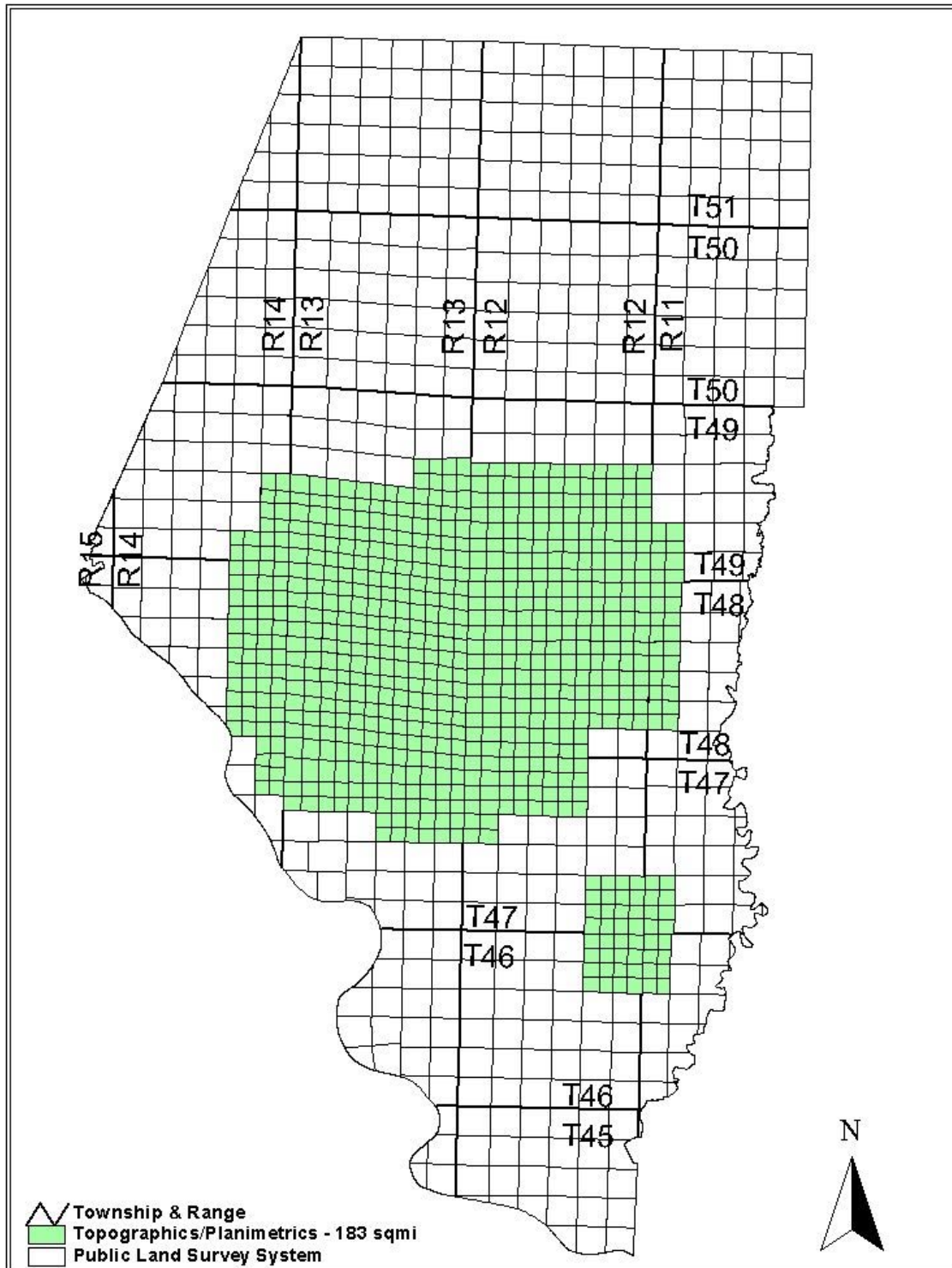




MID-MISSOURI PUBLIC PURCHASING COOPERATIVE

PHASE II County Contract Map

Sheet 24 of 25
Bid No. MM32





MID-MISSOURI PUBLIC PURCHASING COOPERATIVE

GEOGRAPHIC REFERENCE SYSTEM DIAGRAM

(The monuments shown here are DNR
(Missouri Department of Natural Resources) monuments of the first order)

Sheet 25 of 25

Bid No. MM32

