



REQUEST FOR PROPOSALS (RFP)
NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS
for
 Orthophotography, LiDAR and Derivative Services

RFP No. NCT 2017-14
Issued: July 12, 2017

PROPOSAL SUBMISSION DEADLINE:
*******August 11 by 3:00 p.m. Local Time *******
NO LATE PROPOSALS WILL BE ACCEPTED

RESPONSES SHALL BE DELIVERED TO: NCTCOG ATTN: North Texas SHARE 616 SIX FLAGS DRIVE ARLINGTON, TEXAS 76011	RESPONSES SHALL BE MAILED TO: NCTCOG ATTN: North Texas SHARE 616 SIX FLAGS DRIVE ARLINGTON, TEXAS 76011
FOR ADDITIONAL INFORMATION REGARDING THIS RFP PLEASE CONTACT: North Texas SHARE NorthTexasSHARE@NCTCOG.org (817) 695 9186 ***** RETURN THIS COVER SHEET WITH RESPONSE TO: NCTCOG Attn: North Texas SHARE 616 SIX FLAGS DRIVE ARLINGTON, TEXAS 76011	NAME AND ADDRESS OF COMPANY SUBMITTING PROPOSAL: Proposer: _____ Address: _____ City: _____ State: _____ Zip Code: _____ Contact Person: _____ Phone: _____ Fax: _____ Signature: _____ Printed Name: _____

Acknowledgment of Addenda: #1 _____ #2 _____ #3 _____ #4 _____ #5 _____

NOTICE TO PROPOSER: ANY FURTHER INFORMATION OR AMENDMENTS TO THIS SOLICITATION SHALL BE POSTED ON THE NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS' (www.nctcog.org/aa/RFP.asp) AND NORTH TEXAS SHARE (www.NorthTexasSHARE.org) WEBSITES. AMENDMENTS SHALL NOT BE FAXED, EMAILED OR MAILED. IT IS THE PROPOSER'S RESPONSIBILITY TO CHECK THE WEBSITE FOR ANY SOLICITATION CHANGES DURING THE RFP RESPONSE TIME.

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SECTION 1 - OVERVIEW

- 1.01 NCTCOG OVERVIEW The North Central Texas Council of Governments (hereafter NCTCOG) is a voluntary association of, by, and for local governments and was established to assist local governments in planning for common needs, cooperating for mutual benefit and coordinating for sound regional development. NCTCOG serves a 16-county metropolitan region centered around the two urban centers of Dallas and Fort Worth. Currently the Council has 238 members, including 16 counties, 169 cities, 22 independent school districts, and 31 special districts. The area of the region is approximately 12,800 square miles, which is larger than nine states, and the population of the region is over 6.2 million, which is larger than 35 states. A list of all NCTCOG member entities has been provided as Exhibit A.

NCTCOG's Research & Information Services (RIS) department supports NCTCOG's internal computer network and performs demographic research on such topics as population, housing, and employment estimates; population, household, and employment projections; development monitoring; major employers; land use; and tabulation/analysis of Census data. The department also provides regional Geographic Information System (GIS) support through the creation of regional GIS layers and the Regional Data Center, the Spatial Data Cooperative Program which allows regional entities to purchase remote sensing data at a discounted rate and by hosting free bi-annual Regional GIS Meetings.

NCTCOG operates North Texas SHARE (SHARE), a shared services program, as a benefit to other governmental entities. SHARE is a collaboration in the procurement of goods or services for the aid of participants. NCTCOG intends to make the contract resulting from this procurement available to other governmental entities through SHARE. Please consider the potential collective purchasing volume when providing pricing.

- 1.02 PURPOSE OF RFP

The purpose of this request for proposal (RFP) is two-fold. The first purpose (SDCP Proposal) is to receive proposals for the selection of a contractor/s to provide Professional Services and Data as part of the North Central Texas Council of Governments Spatial Data Cooperative Program (SDCP).

On a yearly basis, NCTCOG coordinates with local public agencies to determine the need for remote sensing data as part of the SDCP. Based on participant interest a project area and project deliverables will be defined by the participants. NCTCOG will then work with the selected consultant to establish a cost of services to meet the required deliverables and a timeline to provide back to the participants for approval. Each year the flight constraints and deliverables change and it is possible that in some years participation may fall to a level that NCTCOG elects not to provide a collaborative flight under this arrangement.

The NCTCOG Region includes the following 16 counties: Dallas, Tarrant, Collin, Denton, Rockwall, Kaufman, Wise, Johnson, Hood, Erath, Hunt, Navarro, Ellis, Somervell, Palo Pinto, and Parker, which cover approximately 12,800 square miles. As individual projects

are defined these boundaries may be expanded or contracted at the sole discretion of NCTCOG.

The core components to be included in this proposal are:

- 3” Frame Orthophotography
- 6” Frame Orthophotography
- 6” Pushbroom Orthophotography
- 0.5 meter LiDAR
- 2D Planimetrics
- 3D Planimetrics
- Impervious Surface
- Landcover/Landuse
- Contours
- Other derivative data needs that may arise at a later date

The second purpose of this RFP (SHARE Proposal) is to receive proposals for the selection of a contractor/s to provide Professional Services and Data as part of the SHARE program. Under the SHARE program, **entities that are not inside the NCTCOG 16-County boundary** can use the SHARE contract and its selected vendors and pricing to pursue their own projects. The core components of the SHARE Proposal are the same as the SDCP Proposal.

To bid on the SDCP Proposal, we have provided a pricing matrix for all products and services with several different square mileage scenarios to be filled out. If you would like your bid to be considered for the SHARE contract as well, answer YES to the question at the beginning of the pricing matrix. See Exhibit B for a Scope of Services that details the above project components and Exhibit C for the aforementioned pricing matrix.

Vendors do not have to submit proposals for all parts of this RFP. Only submit pricing information for those products that you are interested in being considered for.

This RFP does not constitute an actual contract for services. All submitted proposals will become the property of NCTCOG and will not be returned. NCTCOG will not be responsible for any costs incurred while responding to the RFP.

1.03 CONTRACT INTENT NCTCOG intends to contract with a one or more qualified Proposer(s) based upon the qualifications of the Proposer that provides the best overall combination of:

- **Compliance with RFP Instructions.** The proposals will be evaluated for general compliance with instructions issued in the RFP. Noncompliance with significant

instructions may be grounds for proposal disqualification.

- **Technical Expertise.** The proposal will be evaluated on the respondent's demonstrated technical suitability for performing the project services.
- **Equipment Ownership.** NCTCOG prefers that the respondents own all the equipment and own or license all the software to be used for the project. This preference increases the likelihood that the equipment will be properly calibrated and well maintained.
- **Technical Approach.** The proposal will be evaluated on the methods and technical details that will be used to complete the project. If bidding on orthophotography or LiDAR, details on the type of digital camera system should be included.
- **Quality Control.** The proposal will be evaluated on the basis of the apparent effectiveness of the respondent's proposed quality control program.
- **Proximity to the Project Area.** While not a mandatory condition, it is recognized that there are advantages for NCTCOG to select a Contractor within reasonable regional proximity. *The location of the office where the work will be performed is more important than the location of the main office and other branch offices.* No proposals will, however, be disqualified solely on the basis of this factor.
- **Subcontracting.** No portion of the work to be awarded under this contract shall be sublet, assigned or otherwise disposed of, except with the written consent of NCTCOG. Consent to sublet, assign or otherwise dispose of any portion of the work awarded under this contract shall not be construed to relieve the Contractor of any responsibility for the fulfillment of any contract agreements. A subcontractor shall not subcontract any portion of its work under this contract.
- **Firm Background.** The proposal will be evaluated on the basis of the respondent's background, including the number of years in business, size, and financial stability.
- **Staff Qualifications.** The proposal will be evaluated on the basis of the respondent's demonstrated staff qualifications, including the required professional registrations. The proposal must include an ASPRS-recognized Certified Photogrammetrist and a Professional Land Surveyor licensed to practice in Texas. *The supervisory staff for this project must be located in the office where the majority of the work will be done.*
- **Similar Project Experience.** The proposal will be evaluated on the basis of project experience that is of a similar technical nature and complexity, for clients that are similar in size, location, and type as NCTCOG. NCTCOG prefers to select a contractor that can demonstrate successful project experience in the State of Texas or at a minimum within the Southwest region of the United States.

- **Schedule and Availability.** The respondent's projected schedule and resource availability will be evaluated in the choice of a contractor, although NCTCOG understands that the actual beginning and completion dates are subject to the notice to proceed.
- **Cost.** The respondent's cost will be considered in the choice of contractor.

The selected Proposer will enter into a two year Contract for services with NCTCOG. At the end of the initial two year contract, and at the discretion of NCTCOG, the Master Contract may be extended with three one-year renewals. The total term of the Master Contract shall not exceed five years. Any extension beyond the initial two year period will be subject to NCTCOG approval.

1.04 RELATIONSHIP TO PARTICIPATING ENTITIES

As part of the NCTCOG mission detailed in the beginning of section 1, the RIS department provides regional GIS support through the Spatial Data Cooperative Program which allows regional entities to purchase remote sensing data at a discounted rate.

Because the resulting contract(s) will be on an as needed basis, there will be no guarantee of any expenditure on any of the resulting Master Contract(s).

1.05 CONTRACT MANAGEMENT AND REPORTING The Contractor will be required to track and report to SHARE on activities relating to the Master Contract. The Contractor will be required to provide management reports to NCTCOG on a quarterly basis with the submission of the administrative fee outlined in 1.05. Examples of management reports include, but are not limited to:

- Participating Entity's name; pricing option chosen; total fee charged. NCTCOG and Vendor will agree to form and content of reports after award of contract.

1.06 REMUNERATION NCTCOG intends to make the contract resulting from this procurement available to other governmental entities through its SHARE Program. Vendors realize substantial efficiencies through their ability to respond to a SHARE solicitation and RFP that will increase their sales opportunities. From these efficiencies, vendors pay an administrative fee to SHARE calculated as a percentage of sales processed through the SHARE contracts awarded and held by the vendor. This administrative fee is not an added cost to SHARE participants. This administrative fee covers the costs of contract marketing and facilitation and offsets expenses incurred by SHARE.

NCTCOG will utilize an administrative fee, in the form of a percent of cost, that will apply to all contracts between awarded Contractor and NCTCOG or Participants resulting from the RFP. The administrative fee will be remitted by the Contractor to NCTCOG on a quarterly basis, along with required quarterly reporting. The remuneration fee for this program will be 2% on sales.

SECTION 2 – PROPOSAL FORMAT

2.01 ADMINISTRATIVE GUIDANCE The information provided herein is intended to assist Proposers in the preparation of proposals necessary to properly respond to this RFP. The RFP is designed to provide interested Proposers with sufficient basic information to submit proposals meeting minimum requirements, but is not intended to limit a submission's content or to exclude any relevant or essential data there from. Proposers are at liberty and are encouraged to expand upon the specifications to give additional evidence of their ability to provide the services requested in this RFP.

2.02 BUSINESS PLAN Business Plans must be concise and in outline format. Pertinent supplemental information should be referenced and included as attachments. All proposals must be organized and tabbed to comply with the following sections:

Tab A LETTER OF TRANSMITTAL. The letter of transmittal must be limited to two pages, and must contain:

1. Proposer's name and any assumed names
2. Physical and mailing address
3. A brief statement of the Proposer's understanding of the work to be done and a summary of its Proposal
4. The names, titles, addresses, email addresses and telephone numbers of the primary contact and other individuals authorized to make representations on behalf of the Proposer
5. A statement that the person signing the transmittal letter is authorized to legally bind the Proposer
6. A statement that the Proposal will remain in effect until a contract has been finalized and a Purchase Order has been issued by NCTCOG to the Awarded Contractor
7. Signature of person(s) authorized to legally bind the Proposer

Tab B TECHNICAL PROPOSAL. This section should constitute the major portion of the proposal and must contain a specific response to items identified below and to all requirements detailed in Section 1. **Proposers must indicate specific examples of how they can meet each requirement.** This should include a respondent's expertise with the methods, hardware and software necessary to perform the project services described in Exhibit B and information on the respondents quality control program. Failure to provide written response to items indicated will be interpreted by the NCTCOG as an *inability* by the Proposer to provide the requested service or function.

Tab D REFERENCES. Please include the organization's name, address, phone number and a contact person for each reference. NCTCOG reserves the right to contact or visit any of the Proposer(s) Proposer's current and/or past customers to evaluate the level of performance and customer satisfaction.

Tab E KEY PERSONNEL. Attach resumes for all managers, supervisors, and other team members who will be involved in the management of the delivery of services under this RFP. Remember that the selection criteria require the proposed team to include an ASPRS-recognized Certified Photogrammetrist and a registered Professional Land Surveyor licensed in the State of Texas. Provide a general explanation and chart which specifies project leadership and reporting responsibilities, and how the team will interface with NCTCOG and Participating Entities project management and team personnel. Designate specific contact person(s) for the following: procurement process, negotiating potential contracts, conducting presentations/interviews,

reporting, and who will be the primary point of contact for receiving Requests for Services from Participating Entities.

Tab F RELATED EXPERIENCE. For up to five (5) relevant projects, include a one- or two-page project description that demonstrates similar capabilities in similar projects, for similar clients. Include the name of the client organization and related contact information in the references section.

Tab G AFFIRMATIVE ACTION PLAN. Include a copy of your affirmative action plan provided as (reference) of this RFP for review (if applicable).

Tab G REQUIRED DOCUMENTS. Please include signed copies of the following documents (if applicable).

1. Instructions for Proposal Compliance and Submittal (Attachment I)
2. Certifications of Offeror (Attachment II)
3. Certification Regarding Debarment, Suspension, and Other Responsibility Matters (Attachment III)
4. Certification Regarding Lobbying (Attachment IV)
5. Drug-Free Workplace Certification (Attachment V)
6. Certification Regarding Disclosure of Conflict of Interest (Attachment VI)
7. Certification of Fair Business Practices (Attachment VII)
8. Certification of Good Standing- Texas Corporate Franchise Certification (Attachment VIII)
9. Historically Underutilized Businesses, Minority, or Women-Owned or Disadvantaged Business Enterprises (Attachment IX)

Tab H MISCELLANEOUS. Miscellaneous additional information and attachments, if any, may be submitted by the Contractor(s).

2.03 **COST PROPOSAL** The Cost Proposal provided as Exhibit C of this RFP shall be completed and submitted in a **separate sealed envelope**.

2.04 **RFP SUBMISSION** Please submit 3 physical copies and 1 electronic copy (on compact disk or USB flash drive) of your response no later than 3:00 p.m. CDT, **August 11, 2017**. Electronic copy of proposal must be one PDF file and not submitted as separate sections. Mark outside envelope "Sealed Proposal –NCT 2017-14 Orthophotography, LiDAR and Derivative Services and send to:

North Central Texas Council of Governments
North Texas SHARE
616 Six Flags Drive, CP II
Arlington, TX 76011

Faxed, emailed or late proposals will be ineligible and not accepted for consideration.

It is the responsibility of the Proposer to ensure that the proposal is received in NCTCOG's office by the designated due date and time. NCTCOG assumes no responsibility for delays caused by postage, mail courier deliveries, email delays or any other form of delivery.

Proposal information is restricted and not publicly available until after award of a contract. All documents associated with the RFP, unless the Proposer indicates a portion of the proposal is proprietary, will be subject to public inspection in accordance with the Public Information Act. All information obtained in the course of this RFP will become property of the NCTCOG.

Proposals will be publicly opened at 3: 20 p.m CDT on August 11, 2017 in the Pecan Conference Room, NCTCOG offices. Only the names of the Proposer will be read aloud. No other information will be disclosed at this time.

2.05 ISSUING OFFICE AND RFP REFERENCE NUMBER The North Texas SHARE program of NCTCOG is the issuing office for this RFP and all subsequent addenda relating to it. The reference number for the RFP is NCT 2017-14. **This number must be referenced on all proposals, correspondence, and documentation relating to the RFP.**

2.06 **SOLICITATION SCHEDULE** The schedule for the RFP process and the work is given below. All times indicated are Central Standard Time (CST). NCTCOG may change this schedule at any time through the addenda process. It is each Proposer’s responsibility to check the website question and answer area for this RFP for current information regarding this RFP and its Calendar of Events through award of the Contract. NCTCOG (www.nctcog.org/aa/RFP.asp) or North Texas SHARE (www.NorthTexasSHARE.org)

The anticipated schedule is as follows:

RFP Issued	July 12, 2017	
Pre-Proposal Conference	July 20, 2017	NCTCOG, 616 Six Flags Drive, Arlington, TX 76011 Fred Keithley Conference Room
Inquiry Period Ends	July 28, 2017	
Proposal Due Date	August 11, 2017	
Interviews (if applicable)	August, 2017	
Anticipated Award	August, 2017	
Anticipated Start Date	September, 2017	

2.07 **PRE-PROPOSAL CONFERENCE** NCTCOG will hold a Pre-Proposal Conference at NCTCOG Offices, 616 Six Flags Drive, Arlington, TX 76011, **Fred Keithley Conference Room**, on, Thursday, July 20, 2017, at 1:30 p.m. CDT. The purpose of this conference is to discuss the RFP and the services required with Proposers and to allow them to ask questions arising from their initial review of this RFP.

A conference line will be available for Proposers unable to attend in person. Email NorthTexasSHARE@nctcog.org for conference line information.

During the conference Proposers shall have the opportunity to ask questions. Oral answers will not be binding. Proposers must follow instruction provided in Section 2.08 of this RFP to submit and receive formal, binding answers to their questions.

Attendance at the Pre-Proposal Conference is a prerequisite to submitting a Proposal.

2.08 **WRITTEN QUESTIONS** Proposers will have until the date and time outlined in Section 2.06 of this RFP to submit in writing all questions regarding this RFP. NCTCOG will answer the questions in a Question and Answer Document posted as an addendum to this RFP.

Only answers provided in writing by NCTCOG shall be considered official. Information in any form other than the materials constituting this RFP, the Question and Answer Document, and any RFP Addendum, shall not be binding on NCTCOG.

All questions submitted to NCTCOG must be submitted to NorthTexasSHARE@nctcog.org using the following format:

Sender Name/Title:			
Sender Company:			
Sender Mailing Address:			
Sender Phone:			
Sender Email:			
Sender Questions			
Question	RFP Section	Paragraph #	Line #

SECTION 3 – PROPOSAL EVALUATION AND AWARD

3.01 **PROPOSAL EVALUATION CRITERIA** The criteria to be used to evaluate submissions are as follows:

	Criteria	Weighting
1.	Compliance with RFP Instructions	Yes/No
2.	Technical Expertise	20%
3.	Equipment Ownership	5%
4.	Technical Approach	10%
5.	Quality Control	10%
6.	Proximity to Project Area	5%
7.	Firm Background	5%
8.	Staff Qualifications	5%
9.	Similar Project Experience	5%
10.	Schedule and Availability	10%
11.	Cost	25%
	Total	100%

3.02 **EVALUATION PROCESS** All submissions in response to this RFP will be evaluated in a manner consistent with NCTCOG and all applicable rules and policies.

Non-responsive submissions (those not conforming to RFP requirements) will be eliminated. Remaining submissions will be evaluated in a cursory manner to eliminate from further consideration those submissions which, in the judgment of the evaluation committee, fail to offer sufficient and substantive provisions to warrant further consideration.

Each Proposer bears sole responsibility for the items included or not included in the response submitted by that Proposer. NCTCOG reserves the right to disqualify any submission that includes significant deviations or exceptions to the terms, conditions, and/or specifications in this RFP.

Proposers' submissions will be selected for detailed review and evaluation, including oral presentations, if necessary. NCTCOG reserves the right to be the sole judge as to the overall acceptability of any submission or to judge the individual merits of specific provisions within competing offers.

NCTCOG may award a contract based on initial submissions received without discussion of such submissions with Proposers. Accordingly, each initial submission should include the most favorable price and service available.

NCTCOG also reserves the right to request a best and final offer to the Proposers who provide the best fit for NCTCOG's proposal requirements. Preference will also be given to those Proposers who can provide support services in addition to staffing the project.

3.03 **INTERVIEWS** SHARE reserves the right to require an interview, including a presentation by the Proposer, to supplement their written submission. These presentations will be scheduled, if required, by Agency Administration after submissions are received and prior to the award of the contract.

- 3.04 AWARD OF THE CONTRACT Upon completion of the evaluation process, NCTCOG may award the contract to the Proposer whose Proposal is determined to be the most advantageous to the SHARE considering the relative importance of price and the other evaluation factors included in the RFP. NCTCOG reserves the right to award in whole and in part, by item or groups of items, by section or geographic area, or make multiple awards, where such action serves NCTCOG or Participant(s) best interests.
- 3.05 CONTRACT PERIOD AND EFFECTIVE DATE The contract will become effective immediately upon execution and will continue until the terms listed in the contract have been satisfied.
- 3.06 NEWS RELEASES News releases pertaining to the RFP, submissions, or the Contract will be made only by NCTCOG.

SECTION 4 - GENERAL TERMS AND CONDITIONS

- 4.01 NCTCOG is exempt from Texas limited sales, federal excise and use tax, and does not pay tax on purchase, rental, or lease of tangible personal property for the organization's use. A tax exemption certificate will be issued upon request.
- 4.02 NCTCOG reserves the right to accept or reject any and/or all submissions or to cancel this notice at any time.
- 4.03 A response to this Request for Proposals (RFP) does not commit NCTCOG to a purchase contract, or to pay any costs incurred in the preparation of such response.
- 4.04 Unless the Proposer specifies in the proposal, the NCTCOG may award the contract for any items/services or group of items/services in the RFP and may increase or decrease the quantity specified.
- 4.05 NCTCOG reserves the right to hold and accept any proposals received by the submission deadline for a period of ninety (90) days after the deadline if a determination has not been made for an award.
- 4.06 NCTCOG reserves the right to negotiate the final terms of any and all purchase contracts with Proposer(s) selected and such contracts negotiated as a result of this RFP may be re-negotiated and/or amended in order to successfully meet the agency needs.
- 4.07 NCTCOG reserves the right to waive any defect in this procurement process or to make changes to this solicitation as it deems necessary. NCTCOG will provide notifications of such changes to all Proposers recorded in the official record (Distribution Log/Receipts Record) as having received or requested an RFP.
- 4.08 NCTCOG reserves the right to contact any individual, agencies, or employers listed in a submission, to contact others who may have experience and/or knowledge of the Proposer's relevant performance and/or qualifications; and to request additional information from any and all Proposers.
- 4.09 NCTCOG reserves the right to conduct a review of records, systems, procedures, etc., of any entity selected for funding. This may occur prior to, or subsequent to, the award of a purchase contract. Misrepresentation of the Proposer's ability to perform as stated in the qualification submittals may result in cancellation of the purchase contract award.
- 4.10 NCTCOG reserves the right to withdraw or reduce the amount of an award, or to cancel any contract resulting from this procurement if adequate funding is not available.
- 4.11 Proposer shall not, under penalty of law, offer or provide any gratuities, favors, or anything of monetary value to any officer, member, employee, or agent of NCTCOG for the purpose of, or having the effect of, influencing favorable disposition toward their own submission or any other submitted hereunder.
- 4.12 No employee, officer, or agent of NCTCOG shall participate in the selection, award, or administration of a contract if a conflict of interest, real or apparent, exists.
- 4.13 Proposer shall not engage in any activity that will restrict or eliminate competition. Violation of this provision may cause a Proposer's bid to be rejected. This does not preclude joint ventures or subcontracts.

- 4.14 All proposals submitted must be an original work product of the Proposer. The copying, paraphrasing, or other use of substantial portions of the work product of others and submitted hereunder, as original work of the Proposer is not permitted. Failure to adhere to this instruction may cause the proposal submission(s) to be rejected.
- 4.15 The only purpose of this RFP is to ensure uniform information in the selection of proposals and procurement of services. This RFP is not to be construed as a purchase contract, or as a commitment of any kind, nor does it commit the NCTCOG to pay for costs incurred prior to the execution of a formal contract unless such costs are specifically authorized in writing by NCTCOG.
- 4.16 The contents of a successful proposal submission may become a contractual obligation, if selected for award of a contract. Failure of the Proposer to accept this obligation may result in cancellation of the award. No plea of error or mistake shall be available to the successful Proposer as a basis for release of proposed services at stated price/cost. Any damages accruing to the NCTCOG as a result of the Proposer's failure to contract may be recovered from the Proposer.
- 4.17 A contract with the selected Proposer may be withheld at the sole discretion of NCTCOG if issues of contract compliance or questioned/disallowed costs exist, until such issues are satisfactorily resolved. Award of contract may be withdrawn by NCTCOG if resolution is not satisfactory to NCTCOG.
- 4.18 NCTCOG is the responsible authority for handling complaints or protests regarding the proposals selection process. This includes, but is not limited to, disputes, claims, protest of award, source evaluation or other matters of a contractual nature. Proposer agrees, to the extent possible and not in contravention of any applicable State or Federal law or procedure established for dispute resolution, to attempt to resolve any dispute between them regarding this process informally through voluntary mediation, arbitration or any other local dispute mediation process, including but not limited to dispute resolution policies of NCTCOG, before resorting to litigation.
- 4.19 At all times during the term of a contract resulting from this procurement, the Contractor shall procure, pay for, and maintain, with approved insurance carriers, the minimum insurance requirements set forth below, and shall require all contractors and sub-contractors performing work for which the same liabilities may apply under this contract to do likewise. The Contractor may cause the insurance to be effected in whole or in part by the sub-contractors or sub-subcontractors under their contracts. NCTCOG reserves the right to waive or modify insurance requirements at its sole discretion.
1. Workers' Compensation: Statutory limits and employer's liability of not less than \$100,000 for each accident.
 2. Commercial General Liability:
 - a. Minimum Required Limits:
 - \$1,000,000 per occurrence;
 - \$1,000,000 General Aggregate
 - b. Commercial General Liability policy shall include:
 - (i) Coverage A: Bodily injury and property damage;
 - (ii) Coverage B: Personal and Advertising Injury liability;
 - (iii) Coverage C: Medical Payments
 - (iv) Products: Completed Operations
 - (v) Fire Legal Liability

- c. Policy coverage must be on an “occurrence” basis using CGL forms as approved by the Texas State Board of Insurance
 - d. Attachment of Endorsement CG 20 10 - additional insured
 - e. All other endorsements shall require prior approval by the NCTCOG.
3. Comprehensive Automobile/Truck Liability: Coverage shall be provided for all owned, hired and non-owned vehicles. Minimum required Limit: \$500,000 combined single limit.
4. Professional Liability:
- a. Minimum Required Limits:
 - 1. \$1,000,000 Each Claim
 - 2. \$1,000,000 Policy Aggregate

4.20 Contractor shall defend, indemnify, and hold harmless NCTCOG, NCTCOG’s affiliates, and any of their respective directors, officers, employees, agents, subcontractors, successors, and assigns from any and all suits, actions, claims, demands, judgments, liabilities, losses, damages, costs, and expenses (including reasonable attorneys’ fees and court costs) (collectively, “Losses”) arising out of or relating to: (i) Services performed and carried out pursuant to the contract; (ii) breach of any obligation, warranty, or representation in the contract, (iii) the negligence or willful misconduct of Contractor and/or its employees or subcontractors; or (iv) any infringement, misappropriation, or violation by Contractor and/or its employees or subcontractors of any right of a third party; provided, however, that Contractor shall have no obligation to defend, indemnify, or hold harmless to the extent any Losses are the result of NCTCOG’s gross negligence or willful misconduct.

ATTACHMENTS & EXHIBITS GUIDE

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ATTACHMENT I
INSTRUCTIONS FOR PROPOSAL COMPLIANCE AND SUBMITTAL

Compliance with the RFP

Submissions must be in strict compliance with this Request for Proposals. Failure to comply with all provisions of the RFP may result in disqualification.

Acknowledgment of Insurance Requirements

By signing its submission, Offeror acknowledges that it has read and understands the insurance requirements for the submission. Offeror also understands that the evidence of required insurance must be submitted within ten (10) working days following notification of its offer being accepted; otherwise, NCTCOG may rescind its acceptance of the Offeror's proposal. The insurance requirements are outlined in Section 4S- General Terms and Conditions.

Name of Organization/Contractor(s):

Signature of Authorized Representative:

Date: _____

**ATTACHMENT II:
CERTIFICATIONS OF OFFEROR**

I hereby certify that the information contained in this proposal and any attachments is true and correct and may be viewed as an accurate representation of proposed services to be provided by this organization. I certify that no employee, board member, or agent of the North Central Texas Council of Governments has assisted in the preparation of this proposal. I acknowledge that I have read and understand the requirements and provisions of the Request for Proposal and that the organization will comply with the regulations and other applicable local, state, and federal regulations and directives in the implementation of this Contract.

I also certify that I have read and understood all sections of this Request for Proposals and will comply with all the terms and conditions as stated; and furthermore that I, _____(typed or printed name) certify that I am the _____ (title) of the corporation, partnership, or sole proprietorship, or other eligible entity named as Offeror and Respondent herein and that I am legally authorized to sign this offer and to submit it to the North Central Texas Council of Governments, on behalf of said Offeror by authority of its governing body.

Name of Organization/Contractor(s):

Signature of Authorized Representative:

Date: _____

**ATTACHMENT III:
CERTIFICATION REGARDING DEBARMENT, SUSPENSION AND OTHER RESPONSIBILITY
MATTERS**

This certification is required by the Federal Regulations Implementing Executive Order 12549, Debarment and Suspension, 45 CFR Part 93, Government-wide Debarment and Suspension, for the Department of Agriculture (7 CFR Part 3017), Department of Labor (29 CFR Part 98), Department of Education (34 CFR Parts 85, 668, 682), Department of Health and Human Services (45 CFR Part 76).

The undersigned certifies, to the best of his or her knowledge and belief, that both it and its principals:

1. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any federal department or agency;
2. Have not within a three-year period preceding this contract been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or Local) transaction or contract under a public transaction, violation of federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification, or destruction of records, making false statements, or receiving stolen property;
3. Are not presently indicated for or otherwise criminally or civilly charged by a government entity with commission of any of the offense enumerated in Paragraph (2) of this certification; and,
4. Have not within a three-year period preceding this contract had one or more public transactions terminated for cause or default.

Where the prospective recipient of federal assistance funds is unable to certify to any of the statements in this certification, such prospective recipient shall attach an explanation to this certification form.

Name of Organization/Contractor(s):

Signature of Authorized Representative:

Date: _____

**ATTACHMENT IV:
CERTIFICATION REGARDING LOBBYING**

The undersigned certifies, to the best of his or her knowledge or belief, that:

1. No federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an officer or employee of a Member of Congress in connection with the awarding of any federal contract, the making of any federal loan, the entering into of any cooperative Contract, and the extension, continuation, renewal, amendment, or modification of any federal contract, grant, loan, or cooperative Contract; and
2. If any funds other than federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of 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, and or cooperative Contract, the undersigned shall complete and submit Standard Form – LLL, “Disclosure Form to Report Lobbying”, in accordance with the instructions.
3. The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers and that all sub-recipients shall certify accordingly.

Name of Organization/Contractor(s):

Signature of Authorized Representative:

Date: _____

**ATTACHMENT V:
DRUG-FREE WORKPLACE CERTIFICATION**

The _____ (company name) will provide a Drug Free Work Place in compliance with the Drug Free Work Place Act of 1988. The unlawful manufacture, distribution, dispensing, possession or use of a controlled substance is prohibited on the premises of the _____ (company name) or any of its facilities. Any employee who violates this prohibition will be subject to disciplinary action up to and including termination. All employees, as a condition of employment, will comply with this policy.

CERTIFICATION REGARDING DRUG-FREE WORKPLACE

This certification is required by the Federal Regulations Implementing Sections 5151-5160 of the Drug-Free Workplace Act, 41 U.S.C. 701, for the Department of Agriculture (7 CFR Part 3017), Department of Labor (29 CFR Part 98), Department of Education (34 CFR Parts 85, 668 and 682), Department of Health and Human Services (45 CFR Part 76).

The undersigned subcontractor certifies it will provide a drug-free workplace by:

Publishing a policy statement notifying employees that the unlawful manufacture, distribution, dispensing, possession or use of a controlled substance is prohibited in the workplace and specifying the consequences of any such action by an employee;

Establishing an ongoing drug-free awareness program to inform employees of the dangers of drug abuse in the workplace, the subcontractor's policy of maintaining a drug-free workplace, the availability of counseling, rehabilitation and employee assistance programs, and the penalties that may be imposed on employees for drug violations in the workplace;

Providing each employee with a copy of the subcontractor's policy statement;

Notifying the employees in the subcontractor's policy statement that as a condition of employment under this subcontract, employees shall abide by the terms of the policy statement and notifying the subcontractor in writing within five days after any conviction for a violation by the employee of a criminal drug abuse statute in the workplace;

Notifying the Board within ten (10) days of the subcontractor's receipt of a notice of a conviction of any employee; and,

Taking appropriate personnel action against an employee convicted of violating a criminal drug statute or requires such employee to participate in a drug abuse assistance or rehabilitation program.

Name of Organization/Contractor(s):

Signature of Authorized Representative:

Date: _____

**ATTACHMENT VI:
CERTIFICATION REGARDING DISCLOSURE OF CONFLICT OF INTEREST**

The undersigned certifies that, to the best of his or her knowledge or belief, that:

“No employee of the Contractor, no member of the Contractor’s governing board or body, and no person who exercises any functions or responsibilities in the review or approval of the undertaking or carrying out of this Contract shall participate in any decision relating to this contract which affects his/her personal pecuniary interest.

Executives and employees of Contractor shall be particularly aware of the varying degrees of influence that can be exerted by personal friends and associates and, in administering the Contract, shall exercise due diligence to avoid situations which give rise to an assertion that favorable treatment is being granted to friends and associates. When it is in the public interest for the Contractor to conduct business with a friend or associate of an executive or employee of the Contractor, an elected official in the area or a member of the North Central Texas Council of Governments, a permanent record of the transaction shall be retained.

Any executive or employee of the Contractor, an elected official in the area or a member of the NCTCOG, shall not solicit or accept money or any other consideration from a third person, for the performance of an act reimbursed in whole or part by Contractor or Department. Supplies, tools, materials, equipment or services purchased with Contract funds shall be used solely for purposes allowed under this Contract. No member of the NCTCOG shall cast a vote on the provision of services by that member (or any organization which that member represents) or vote on any matter which would provide a direct or indirect financial benefit to the member or any business or organization which the member directly represents”.

No officer, employee or paid consultant of the Contractor is a member of the NCTCOG.

No officer, manager or paid consultant of the Contractor is married to a member of the NCTCOG.

No member of NCTCOG directly owns, controls or has interest in the Contractor.

The Contractor has disclosed any interest, fact, or circumstance that does or may present a potential conflict of interest.

No member of the NCTCOG receives compensation from the Contractor for lobbying activities as defined in Chapter 305 of the Texas Government Code.

Should the Contractor fail to abide by the foregoing covenants and affirmations regarding conflict of interest, the Contractor shall not be entitled to the recovery of any costs or expenses incurred in relation to the contract and shall immediately refund to the North Central Texas Council of Governments any fees or expenses that may have been paid under this contract and shall further be liable for any other costs incurred or damages sustained by the NCTCOG as it relates to this contract.

Name of Organization/Contractor(s):

Signature of Authorized Representative:

Date: _____

**ATTACHMENT VII:
CERTIFICATION OF FAIR BUSINESS PRACTICES**

That the submitter has not been found guilty of unfair business practices in a judicial or state agency administrative proceeding during the preceding year. The submitter further affirms that no officer of the submitter has served as an officer of any company found guilty of unfair business practices in a judicial or state agency administrative during the preceding year.

Name of Organization/Contractor(s):

Signature of Authorized Representative:

Date: _____

**ATTACHMENT VIII:
CERTIFICATION OF GOOD STANDING – TEXAS CORPORATE FRANCHISE TAX
CERTIFICATION**

Pursuant to Article 2.45, Texas Business Corporation Act, state agencies may not contract with for profit corporations that are delinquent in making state franchise tax payments. The following certification that the corporation entering into this offer is current in its franchise taxes must be signed by the individual authorized on Form 2031, Corporate Board of Directors Resolution, to sign the contract for the corporation.

The undersigned authorized representative of the corporation making the offer herein certified that the following indicated statement is true and correct and that the undersigned understands that making a false statement is a material breach of contract and is grounds for contract cancellation.

Indicate the certification that applies to your corporation:

_____ The Corporation is a for-profit corporation and certifies that it is not delinquent in its franchise tax payments to the State of Texas.

_____ The Corporation is a non-profit corporation or is otherwise not subject to payment of franchise taxes to the State of Texas.

Type of Business (if not corporation): Sole Proprietor
 Partnership
 Other

I.R.S. Tax Number: _____

(Printed/Typed Name and Title of Authorized Representative)

Signature

Date: _____

**ATTACHMENT IX:
 HISTORICALLY UNDERUTILIZED BUSINESSES, MINORITY OR WOMEN-OWNED OR
 DISADVANTAGED BUSINESS ENTERPRISES**

Historically Underutilized Businesses (HUBs), minority or women-owned or disadvantaged businesses enterprises (M/W/DBE) are encouraged to participate in the RFP process. Representatives from HUB companies should identify themselves and submit a copy of their Certification.

NCTCOG recognizes the certifications of both the State of Texas Program and the North Central Texas Regional Certification Agency. Companies seeking information concerning HUB certification are urged to contact:

State of Texas HUB Program
 Texas Comptroller of Public Accounts
 Lyndon B. Johnson State Office Building
 111 East 17th Street
 Austin, Texas 78774
 (512) 463-6958
<http://www.window.state.tx.us/procurement/prog/hub/>

Local businesses seeking M/W/DBE certification should contact:

North Central Texas Regional Certification Agency
 624 Six Flags Drive, Suite 100
 Arlington, TX 76011
 (817) 640-0606
<http://www.nctrca.org/certification.html>

Submitter must include a copy of its minority certification documentation as part of this RFQ.
 If your company is already certified, attach a copy of your certification to this form and return with your proposal.

Indicate all that apply:

- Minority-Owned Business Enterprise
- Women-Owned Business Enterprise
- Disadvantaged Business Enterprise

ATTEST TO Attachments of Certification:

 Authorized Signature

 Typed Name

 Date

Subscribed and sworn to before me this _____ day of _____ (month), 20__ in

_____ (city), _____ (county), _____ (state).

SEAL

Notary Public in and for _____ (County),
 State of _____ Commission expires: _____

EXHIBIT A:
NCTCOG MEMBER ENTITIES*
*(*This is not an exhaustive list of potential Participants.)*

NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS MEMBER ENTITIES

Counties (16)

Collin	Erath	Kaufman	Rockwall
Dallas	Hood	Navarro	Somervell
Denton	Hunt	Palo Pinto	Tarrant
Ellis	Johnson	Parker	Wise

Cities (169)

Addison	Dish	Kaufman	Ponder
Aledo	Double Oak	Keene	Princeton
Allen	Dublin	Keller	Prosper
Alvarado	Duncanville	Kemp	Quinlan
Alvord	Edgecliff Village	Kennedale	Red Oak
Anna	Ennis	Kerens	Reno
Annetta	Eules	Krum	Rhame
Argyle	Everman	Lake Bridgeport	Richardson
Arlington	Fairview (Collin)	Lake Dallas	Richland Hills
Aubrey	Farmers Branch	Lakewood Village	Rio Vista
Aurora	Farmersville	Lake Worth	River Oaks
Azle	Ferris	Lancaster	Roanoke
Balch Springs	Flower Mound	Lavon	Rockwall
Bartonville	Forest Hill	Lewisville	Rowlett
Bedford	Fomey	Little Elm	Royse City
Benbrook	Fort Worth	Lucas	Runaway Bay
Blooming Grove	Frisco	Mabank	Sachse
Blue Mound	Garland	Mansfield	Saginaw
Blue Ridge	Glenn Heights	McKinney	Sanger
Bridgeport	Glen Rose	McLendon-Chisholm	Sansom Park
Burleson	Gordon	Melissa	Scurry
Caddo Mills	Graford	Mesquite	Seagoville
Carrollton	Granbury	Midlothian	Southlake
Cedar Hill	Grand Prairie	Milford	Springtown
Celeste	Grandview	Millsap	Stephenville
Celina	Grapevine	Mineral Wells	Sunnyvale
Cleburne	Greenville	Murphy	Talty
Cockrell Hill	Hackberry	Newark	Terrell
Colleyville	Haltom City	New Fairview	The Colony
Combine	Haslet	New Hope	Trophy Club
Commerce	Heath	Northlake	University Park
Coppell	Hickory Creek	North Richland Hills	Venus
Copper Canyon	Highland Park	Oak Point	Watauga
Corinth	Highland Village	Oak Ridge	Waxahachie
Corsicana	Hudson Oaks	Ovilla	Weatherford
Crandall	Hurst	Palmer	West Tawakoni
Cross Timbers	Hutchins	Pantego	Westworth Village
Crowley	Irving	Paradise	White Settlement
Dallas	Italy	Parker	Willow Park
Dalworthington Gardens	Josephine	Pecan Hill	Wilmer
Decatur	Joshua	Pilot Point	Wolfe City
Denton	Justin	Plano	Wylie
DeSoto			

Arlington ISD	Duncanville ISD	Irving ISD	Plano ISD
Birdville ISD	Farmersville ISD	Kaufman ISD	Richardson ISD
Carrollton-Farmers Branch ISD	Fort Worth ISD	Lewisville ISD	Rockwall ISD
Cedar Hill ISD	Garland ISD	Mansfield ISD	Terrell ISD
Denton ISD	Grand Prairie ISD	Mesquite ISD	Weatherford ISD
	Hurst-Eules-Bedford ISD	Midlothian ISD	

Special Districts (31)

Acton Municipal Utility	Dallas County Utility and Reclamation	Lake Cities MU Authority
Area Metropolitan Ambulance Authority	Dallas County WCID #6	NE TX Rural Rail District
Benbrook W/S Authority	Dalworth Soil and Water	North Texas MWD
Collin Central Appraisal District	Denton Co. FWSD #1A	North Texas Tollway Authority
Central Appraisal, Johnson Co.	Denton Co. FWSD #6/7	Tarrant Reg. Water District
Dallas Area Rapid Transit	Denton Co. Trans. Authority	Trinity River Authority
Dallas Co. Community College District	Fort Worth Transp. Authority	Trinity River Vision Authority
Dallas Co. Park Cities MU	Hunt Memorial Hospital District	Trophy Club MUD #1
Dallas County Schools	Johnson County Special Utility District	Valwood Imp. Authority
	Johnson County FWSD #1	Weatherford College
		Wise Co. Water Control & Improvements Dist. #1

EXHIBIT B: SCOPE OF SERVICES

The following scope of services includes descriptions and standards for the photogrammetric products that the North Central Texas Council of Governments (NCTCOG) is interested in receiving bids on. The list includes, but is not limited to:

- Orthophotography
- LiDAR
- Contours
- Planimetric Data
- Impervious Surface
- Landcover/Landuse

The following requirements are based off of specifications developed by the Texas Water Development Board (TWDB), United States Geological Survey (USGS) and existing NCTCOG requirements. As well as standards set by The American Society of Photogrammetry and Remote Sensing (ASPRS) and the National Standard for Spatial Data Accuracy (NSSDA).

SECTION 1 **SHARED STANDARDS & REQUIREMENTS**

This section includes standards and requirements that will be used for all photogrammetric products and derivatives.

Project Datum: The consultant will provide all data in the following project datum:

- Horizontal datum: North American Datum 1983 (NAD83), Texas State Plane Coordinate System, North Central Zone, and expressed in U.S. Survey Feet.
- Vertical datum: North American Vertical Datum 1988 (NAVD88).

Accuracy: All mapping products will meet or exceed ASPRS Class 1 standard.

- 1"= 50' scale mapping (GSD = 0.25-foot, Limiting RMS Error = 0.5 ft.)
- 1" = 100' scale mapping (GSD = 0.50-foot, Limiting RMS Error = 1.0 ft.)

All derivative products are expected to match the accuracy standards of the data they are derived from. In most case this will be 1"=100' (RF = 1:1,200) scale mapping. More information on horizontal and vertical accuracy standards can be found in Exhibit D, Section 7.3 and 7.4.

Metadata: The consultant will provide metadata compiled at the product set level and conforming to the current Federal Geographic Data Committee (FGDC) standard (FGDC-STD-001-1998) for each of the product sets. The metadata will be USGS parser compliant.

Quality Assurance and Quality Control: The consultant will have a rigorous QA/QC workflow for each photogrammetric product and derivative that uses the following industry standards.

- 2014 ASPRS Accuracy Standards for Digital Geospatial Data
- National Standard for Spatial Data Accuracy (NSSDA).
- USGS LiDAR Based Specifications 1.2

The consultant will have ASPRS Certified Photogrammetrists and Mapping Scientists assigned to each project to perform this task. Consultant will be expected to give a detailed QA/QC report prior to any project delivery.

Additionally, the consultant will provide an external reporting and quality control method or medium that is easily accessible by all participants of the project and effectively communicates project issues to vendor and vice versa. The preferred medium is an internet portal with the project limits and project updates. This medium will be used by the client during a designated review period prior to delivery of each product. After delivery, the client will have 6 months to review and submit any problems that may have been overlooked during the initial client review.

Cloud Delivery: The consultant will provide a platform for delivering all final data through the cloud. Platform will need to be user friendly and capable of supporting multiple users with differing delivery areas and types. Past projects delivered out data quickly and securely to 70+ project participants. The platform will be available to clients for downloading purposes for 6 months after initial project delivery.

In addition to the cloud delivery, the consultant will also provide all full datasets to NCTCOG on a hard-drive.

SECTION 2 **HIGH-RESOLUTION ORTHOPHOTOGRAPHY**

The selected consultant will provide 4-band digital orthophotography for the project area defined by the NCTCOG.

2.1 Flight Planning & Acquisition

Aircraft & Camera: Digital camera sensor system onboard fixed wing or helicopter airborne platforms. The digital camera sensor system shall be a tested, stable (maintained), geometrically calibrated system with appropriate documentation, suitable for use in the acquisition and production of precision photogrammetric orthophotography.

The axis of the camera should be in a vertical position. The tilt (departure from the vertical) should not exceed four degrees (4°) or the relative tilt between images or strips exceed six degrees (6°). Tilt shall not average more than two degrees (2°) in any 16km (10 mile) section of a flight line and shall not average more than one degree (1°) for the entire project.

The contract administrator shall be notified of all camera malfunctions within 72 hours with a written report of the malfunction. A malfunction is defined as a failure in any element or process of the camera that causes an interruption of the normal operations of the camera system which includes any key components, such as camera mount, airborne global positioning system, inertial measurement unit, and on-board data storage. All projects will be flown by the same type of camera unless otherwise specified by NCTCOG.

All project aircraft must be maintained and operated in accordance with the regulations of the Federal Aviation Administration. Individual crewmembers must have experience in flying precise photographic missions for aerial surveys. Individual résumés will be required.

Flight Design: The flight design shall achieve the requested pixel resolution without any resampling or spatial interpolation intended to improve the spatial resolution of the imagery.

- Forward Overlap – 60% or greater
- Sidelap – minimum 15%, maximum 45%
- Consultant is expected to have two planes in the air to maximize exposure during peak zenith angles and must fly in a North to South or South to North orientation unless otherwise approved by NCTCOG.
- Flight height in accordance with specified Orthophotography spatial resolution. There should be a 1:1 ratio between capture pixel size and ground resolution
- 500 foot buffer around AOI
- No voids do to cloud cover, instrument failure or water bodies

Timeframe & Sun Angle: Each day airplanes must fly between 30% up sun angle and 30% down sun angle. All imagery will be collected during the Winter/early-Spring flying season (January to mid-March) during leaf-off conditions for deciduous vegetation in the NCTCOG region and streams should be within their normal banks, unless otherwise negotiated.

Airspace: Projects will likely contain areas of controlled or restricted airspace. It is the responsibility of the imagery provider to obtain all approvals necessary for all required clearances to cover the AOI. Consultant will notify NCTCOG of their discussions with the DFW FAA at least two weeks prior to the start of any project.

Flight Conditions: During planning and acquisition, significant effort will be made to limit clouds, snow, fog, haze, smoke, or other ground obscuring conditions in the imagery. In no case will the maximum cloud cover exceed 5% per image. Within the immediate areas of power plants or factories, some steam or smoke and/or shadows may be visible on imagery.

The consultant will provide daily weather reports during the acquisition phase of the project. NCTCOG and the consultant will collectively determine the appropriate action if the aerial acquisition task cannot be completed within the window of opportunity due to uncontrollable events such as weather or ground conditions.

Ground Control: Ground and airborne GPS control will be acquired at sufficient density and accuracy to support large scale mapping specifications that conform to the Federal Geographic Data Committee Standards for Geospatial Positional Accuracy and ASPRS Standards for Large Scale Mapping. All panel locations must be set by the start of the aerial mapping project under the supervision of a Registered Professional Land Surveyor (RPLS). Inertial Measurement Unit (IMU) is included as a component of the camera station control.

- The horizontal root-mean-square error (RMSE) of the airborne GPS control data shall not exceed **0.2m**. The vertical RMSE of the airborne GPS control shall not exceed **0.3m**.
- The RMSE of the adjusted IMU data shall not exceed **0.3m** and must be used to ensure accuracy.

Control will be established using Dallas and Fort Worth's Virtual Reference Stations (VRS) and will be acquired using a combination of either Leica or Trimble geodetic grade dual-frequency and RTK GPS receivers. NCTCOG will coordinate with TXDOT to request access to the VRS network system.

Reflight & Natural Disaster: If re-flight is necessary, new imagery must be acquired as quickly as possible to replace rejected photographs or flight-lines. The consultant, at no additional fee, must correct aerial imagery that does not meet defined specifications. All re-flights must be centered on the plotted flight lines and photography must be acquired with the same camera system used in the original flight.

In the event of a natural disaster, the consultant may be asked to fly an area on short notice. If this occurs, NCTCOG and the consultant will negotiate a reasonable price for this additional flight. The consultant will have an established protocol in place so that disaster related projects can move forward with maximum speed and efficiency

2.2 Data Processing & Product Development

Image Processing/AT: The consultant will perform image processing, along with aerial triangulation to extend and densify the ground control to support the new digital orthophotography. Aero-triangulation will

be performed using industry accepted procedures to support the horizontal accuracy requirements of the digital orthophotography.

Resolution: The consultant will produce 4-band (R,G,B, NIR) digital orthophotography with a 0.25-foot (3-inch) and/or 0.50-foot (6-inch) pixel resolution for the defined project areas. Mis-registration between any bands shall not exceed 1 pixel. All bands (R,G,B,NIR) shall be captured simultaneously or near simultaneously (<500 milliseconds difference) using a single camera.

Unprocessed (raw) data should have a bit depth of > 8, such as 12 or 16. Final tiled uncompressed and compressed orthophotography should be 8-bit unsigned per band. The original bit depth at data acquisition should remain the same throughout all image processing steps. Conversion to 8-bit should only occur during the mosaic step.

Digital Elevation Model (DEM): Digital Elevation Models (DEMs) will be constructed by the consultant using industry accepted procedures with sufficient density of points to support production of digital orthophotographs at the required specifications. An Auto Correlated Surface (ACS), will be provided by NCTCOG to be used by the consultant to further tie down the imagery.

Radiometric Adjustments: The images will be interactively mosaicked to produce imagery with consistent tone, density, and color balance. The aesthetic quality of the orthophotography is rated separately from the spatial accuracy. A single orthophoto tile may warrant rejection if it fails in any of the categories listed below. The consultant will provide NCTCOG with multiple image processing samples during the pilot phase of the project so that the best image palette can be determined.

- **Histogram Clipping** - Imagery shall have a tonal range that prevents the clipping of highlight or shadow detail.
- **Brightness** – the mean pixel count shall be within $\pm 7.5\%$ of the middle DN value allowed for 8-bit data (min. 108, max. 147). Images should not appear too dark or too bright.
- **Contrast** – Images should not be faded or washed out.
- **Color balancing** should be performed so that no color shift (one dominant color) exists within an image. Overall tonal quality should be rich, not dull. Features should exhibit their true color in a natural color composite. In a color infrared composite, dominant red/pink tones should not be present in non-infrared sensitive features.
- **Seamlines** – Localized adjustment of the brightness and color values will be done to reduce radiometric differences between seamline join areas. Changes in color balance across the project, if they exist, shall be gradual. Abrupt tonal variations between image files are not acceptable.
- **Shadows** should not be too dark. Features in shadow should retain a maximum level of detail without compromising other components of the image.
- **Sharpening** – Minimally sharpened imagery is preferred, however, processes that highly sharpen data should be avoided in order to maintain absolute accuracy.
- **Artifacts** – Image data shall be free of artifacts and blemishes that obscure ground feature detail. Feature ‘blooming’ or oversaturation should be minimal.

- **Noise** – Image data shall be free of noise caused by camera sensor abnormalities.

Additional issues are known to occur during image acquisition. The consultant will work to correct these issues during the image processing phase of the project. Those issues that are discovered after delivery will be corrected during QA/QC.

The consultant will take special care around bridges, overpasses, water towers and radio towers to correct excessive distortion. Bridges and overpasses will not appear to be warped or skewed. Visible seam-lines are acceptable over large bodies of water. Building rooftops, water towers and radio towers shall not be clipped at seam-lines or between individual image tiles. Bridges and overpasses will have minimal lean.

Formats & Compression: The project-wide imagery will be delivered in uncompressed GeoTIFF format with accompanying world files. Full tiff tiles will be used for the entire project area - any incomplete tiles will be rejected. The consultant will use NCTCOG's provided 2,000' X 3,000' tiff tile index. .

In addition to the TIFF files, the Consultant will compress the digital orthophotos using MrSID software compression (Generation 2, 3-band and Generation 4, 4-band). Coordinate information will be embedded in each individual header as well as in the accompanying world file.

Generation 2 and Generation 4 MrSID images will be delivered using the MrSID index grid supplied by NCTCOG and will contain thirty (30) TIFF images with a 1:18 compression unless all parties agree upon other methodology.

Naming conventions will follow the NCTCOG supplied index grids.

Pilot: The consultant will submit approximately +/-2 square mile pilot areas for each 3-inch and 6-inch products to determine color balance and LUT values.

Web Mapping Service: The consultant shall also serve out an interim orthophotography web mapping layer prior to processing and QC and a final Orthophotography web mapping layer for a period of two years after delivery.

2.3 True Orthophotography

As part of the 6-inch orthophotography project, the consultant will produce true orthos in central business districts with buildings that exceed 60 stories. This includes, but is not limited to the following areas:

- Downtown Dallas
- Downtown Fort Worth
- Dallas North Tollway corridor from IH-635 to Keller Springs Parkway

The imagery will be geometrically corrected for displacement due to relief. This correction will eliminate building lean. Maximum effort will be taken by consultant to minimize building shadows as well.

True Ortho Specifications:

- Resolution - 6 inch
- Flying Altitude - 9500-feet AGL
- Forward Lap - 60%
- Side Lap - 60%
- Ground Conditions - Free from snow, haze, fog or dust; when streams are within their normal banks.
- Sun Angle - flown as close to high noon as possible
- Atmospheric Moisture - less than 5% cloud cover

SECTION 3 0.5 METER LIDAR

The consultant will obtain LiDAR for a project area/areas defined by the NCTCOG. If flight clearances are required, the consultant will converse with the FAA at Dallas Fort Worth (DFW) International Airport to obtain those clearances.

3.1 Flight Planning & Acquisition

System Requirements: The consultant will use industry approved LiDAR systems for this project. The system must be capable of measurement rates of 500kHz and of recording up to five returns per laser pulse. For lidar systems with an oscillating mirror, scan angle should not exceed ± 20 degrees from nadir. Total field of view or full scan angle $\leq 40^\circ$. Rotating mirror systems are exempt from this requirement.

Nominal Pulse Spacing: The consultant will obtain data at a nominal pulse spacing (NPS) of 0.5-meters, 4 points perimeter.

Flight Design: The flight plan will be developed to take advantage of the AOI geometry to minimize flight time and costs while maintaining high accuracy of the acquired data. The relative accuracy for the LiDAR data will be ≤ 6 cm RMSEz within the individual swaths and ≤ 8 cm within swath overlap (between adjacent swaths). Minimum 30% overlap on adjoining swaths.

Spatial distribution of points must be uniform and free from clustering. 90% of cells in a 1-meter grid will contain at least one first-return point. See Data voids for exclusions.

A 500 foot buffer surrounding the AOI is required for flight planning and acquisition, with no buffer needed in between tiles. Buffer will not be included in final delivery.

Multiple Return Attributes: Lidar sensor shall be capable of at least three (3) returns per pulse, including first and last returns. Multiple returns from a given pulse shall be stored in sequential order and point families must remain intact.

Each return must include: easting, northing, elevation, intensity, order of return (i.e. first-return, second-return), classification, and Adjusted GPS Time. Easting, northing, and elevation must be recorded to the nearest 0.01 m and GPS second reported to the nearest microsecond (or better). May include additional attributes. No duplicate entries.

Flight Conditions: The LiDAR data acquisition will occur day or night when no snow is on the ground, rivers are within their channels or below normal levels, when the sky is sufficiently clear of clouds, smoke and atmospheric haze.

Positional Accuracy Validation: The absolute and relative accuracy of the data, both horizontal and vertical, and relative to known control, shall be verified prior to classification and subsequent product development. Report accuracies in metadata as compiled to meet X meters vertical accuracy at the 95% confidence level in open terrain according to the NSSDA.

Acquisition GPS Procedures: At least two (2) GPS reference stations in operation during all missions,

sampling positions at 1 Hz or higher frequently. Differential GPS baseline lengths shall not exceed 40 km, unless otherwise approved. Differential GPS unit in aircraft shall sample position at 2 Hz or more frequently. Lidar data shall only be acquired when GPS PDOP is ≤ 4 and at least 6 satellites are in view.

Ground Control: The consultant will set new control points for the 0.5-meter LiDAR to meet accuracy requirements, 9.25cm vertical accuracy. All survey tasks will be performed under the supervision of a Registered Professional Land Surveyor (RPLS). All control will tie into the TxDOT VRS system.

Accuracy Class:

ASPRS Class 10cm	Non-Vegetated	RMSE_z	< 10 cm
		Accuracy _z 95%	< 19.6 cm
	Vegetated	Accuracy _z 95%	< 29.4 cm
	Horizontal	RMSE_r	< 25.0 cm
	Relative (swath to swath)**	RMSE_{Dz}/Max Diff	< 8.0/16.0 cm

Data Voids: Data voids are defined as areas $> [(4*NPS)^2]$ with no first-return points. Data voids are unacceptable unless caused by water bodies or areas of low near-infrared (NIR) reflectivity (i.e. wet asphalt). No voids between swaths.

Breakline Compilation Along Water Bodies: The consultant will use breaklines to perform hydrologic flattening of water bodies, and the gradient hydrologic flattening of double line streams. Lakes, reservoirs, and ponds, at a nominal size of two (2) acres or greater (~350’ feet in diameter for a round pond), will be compiled as closed polygons. The closed water bodies will be collected at a constant elevation. Rivers, creeks and streams, at a nominal minimal width of 30.5 meters (100-feet), will be compiled in the direction of flow, with both sides of the stream maintaining an equal gradient elevation. The LiDAR ground points and hydrologic feature breaklines will be used to generate a new DEM.

The hydrologic breaklines compiled as part of the flattening process will be provided as an ESRI shapefile. The breaklines defining the water bodies greater than 2-acres will be provided as a PolygonZ files. The breakline compiled for the gradient flattening of all rivers and streams at a nominal minimum width of 30.5 meters (100-feet) will be provided as a PolylineZ file.

3.2 Data Processing & Product Development

Fully Classified All-Return Point Cloud

Point cloud data will be delivered in a single LAS 1.4 format file, one for each deliverable tile.

ASPRS Classification: Point cloud data will be classified according to ASPRS Classification Standards for LAS.

- Class 1 – Processed but not classified
- Class 2 – Bare earth ground
- Class 3 – Low vegetation

- Class 4 – Medium vegetation
- Class 5 – High vegetation
- Class 6 – Building
- Class 7 – Noise
- Class 9 – Water
- Class 10 - Ignored ground
- Class 13 - Bridges
- Class 14 - Culverts

Withheld Points & Classification Accuracy: In accordance with USGS LiDAR Base Specifications Version 1.2, outliers, noise, blunders, geometrically unreliable points near the extreme edge of the swath and other points deemed unusable are to be identified using the “Withheld” flag. Noise points may be assigned to the standard Noise Class (7), regardless of whether the noise is lower or higher relative to the ground.

The ASPRS Overlap Class (12) shall not be used. All points must be classified unless identified as “Withheld”.

Within any sample 1km x 1km area, no more than 1% of non-withheld points in the classes listed above will possess a demonstrably erroneous classification value. This includes Unclassified points (1) that should be correctly included in a different class as required by this specification.

Point classification shall be consistent across the entire project. Noticeable variations in the character, texture, or quality of the classification between tiles, swaths, lifts, or other non- natural divisions will be cause for rejection of the entire deliverable.

Bare Earth Surface (Raster DEM)

A digital elevation model (DEM) will be created and delivered for each delivery tile.

Format: Hydro-enforced 32-bit floating point raster, ERDAS .IMG format to the nearest 0.1m. DEM will be created from bare earth surface model created during the post processing of the raw point cloud data. DEM elevations will be in meters, to two decimal values.

The data source date for the DEMs will be the latest date that LiDAR data is acquired for the given tile. Georeference information will be included in each raster file.

Spatial Resolution & Reference: DEM post positions will be clipped to the appropriate formats using the NCTCOG supplied grid. The DEM grids will be at a resolution of (1) meter. All data will be projected and defined according to the overarching project specifications in Section 1.

Buffer: All final DEM tiles should be delivered with a buffer that extends 50 meters around all four sides of the DEM tile. All final DEM tiles should have 90 degree corners, not rounded. The extents shall be computed by projecting the geographic corners and side midpoints to the required projection, then adding the buffer on each side of the resulting minimum bounding rectangle.

Quality: No seams, stepping, gaps, or quilting should be visible (unless naturally occurring), whether caused by differences in processing quality or character between tiles, swaths, lifts, or other non-natural divisions and will be cause for rejection of the entire DEM deliverable. There shall be no “plateau effect” from rounded or integer elevation values (must be floating point). Also see ‘Data voids’ below.

Artifacts: Vegetation, bridges, buildings, and other artifacts must be completely removed from Class 2 Bare-earth Ground. Artificial dams in waterways caused by bridges or other adjacent structures are not permitted with the exception of culverts. See ‘Culverts’ under Hydro-flattening Breaklines for more information. Bare-earth lidar points that are near the breaklines shall be classified as Ignored Ground (Class 10) and be excluded from the hydro-flattened DEM creation process to prevent surface artifacts from being created between mass points and breakline vertices. The proximity threshold for reclassification as Ignored Ground in general will not exceed the ANPS.

Filtering: There shall be no over-aggressive filtering of the Ground class resulting in gaps or a degradation of DEM quality (e.g. hilltops shaved flat or data voids). There shall also be no under-aggressive filtering of the Ground class resulting in a degradation of DEM quality (e.g. portions of buildings or vegetation included in Ground or overly noisy surface).

Sinks: Depression sinks, natural or man-made (not erroneous), are **not** to be filled (as in hydro-conditioning).

Breaklines: Hydrologic breaklines shall be used to define stream/river channels and water bodies allowing for unimpeded water flow. See Hydro-flattening Breaklines below for more information.

Data Voids: Void areas, such as areas outside the task order AOI boundaries, but within the tiling scheme will be coded using a unique “NODATA” value. This value will be identified in the appropriate location within the file header.

Hydro-flattening Breaklines

Format: All breaklines developed for use in hydro-flattening shall be delivered as a non-tiled Esri feature class for the entire AOI in polygon and/or polyline shapefile or geodatabase format.

Waterbodies (ponds, lakes, and reservoirs), wide streams and rivers (“double-line”), and other non-tidal waterbodies are to be hydro-flattened within the DEM, resulting in a flat and level bank-to-bank gradient. The entire water surface edge must be at or below the immediately surrounding terrain.

Spatial Reference: All data will be projected and defined according to the overarching project specifications in Section 1.

Stream Resolution: Hydro-flattening shall be applied to all streams that are nominally wider than **15.25 meters**, and to all non-tidal boundary waters bordering the project area regardless of size. Stream features should be made continuous even when a segment narrows below this threshold for a distance of at least 1600 meters to maintain cartographic integrity. Flattened rivers and streams shall present a gradient downhill water surface, in accordance with the immediately surrounding terrain. In cases of drought, flood or rapidly moving water demonstrating conditions where the water surface is notably not level bank to bank, the water surface

will be represented as it exists during acquisition while maintaining an aesthetic cartographic appearance.

Waterbody Resolution: Hydro-flattening shall be applied to all water impoundments, natural or man-made, that are nominally larger than **1 hectare** in area (equivalent to 10,000 m² or roughly equivalent to a round pond ~100 meter in diameter). Long impoundments such as reservoirs, inlets, and fjords, whose water surface elevations drop when moving downstream, are required to be treated as rivers.

Non-tidal boundary waters: Represented only as an edge or edges within the project area; collection does not include the opposing shore. Water surface is to be flat and level, as appropriate for the type of water body (level for lakes; gradient for rivers). The entire water surface edge must be at or below the immediately surrounding terrain.

Tidal waters: Tidal water bodies are defined as water bodies such as oceans, seas, gulfs, bays, inlets, salt marshes, large lakes, and the like. This includes any water body that is affected by tidal variations. Tidal variations over the course of a collection or between different collections will result in lateral and vertical discontinuities along shorelines. This is considered normal and these anomalies should be retained. The final DEM is required to represent as much ground as requirements with regard to how tidal land-water boundaries are to be handled. For such projects, the requirements of the research will take precedence. The collected data permits. Water surface is to be flat and level, to the degree allowed by the irregularities noted above. Scientific research projects in coastal areas often have specific requirements with regard to how tidal land-water boundaries are to be handled. For such projects, the requirements of the research will take precedence.

Islands: Permanent islands 5,000 m² or larger shall be delineated within all water bodies.

Culverts: Stream channels should break at road crossings (culvert locations). These road fills in Class 14 Culverts should not be removed from the DEM. However, streams and rivers should not break at elevated bridges. Bridges should be removed from the DEM (see 'Artifacts' under Bare Earth Lidar/DEM Raster). When the identification of a feature such as a bridge or culvert cannot be made reliably, the feature should be regarded as a culvert.

Intensity Images

Consultant will deliver raster images of first-return intensity values in [GeoTiff](#). For spatial resolution, reference & buffer, see DEM requirements.

Radiometric resolution: Unsigned 8-bit, 16-bit or 32-bit (highest available). Intensity images should typically contain original digital number (DN) values ranging from 0 - 100 or greater for ≥ 80% of areas with diverse land cover conditions.

Histogram: Histogram should be very close to normally distributed with minimal or no clipping.

Consistency: Images should be consistent in contrast and tone across project AOI. There should be no striping, tiling, or banding across project AOI.

SECTION 4

DERIVATIVE PRODUCTS

4.1 CONTOURS

The consultant will utilize existing 0.5-meter LiDAR data to create 2-foot contours for the defined project area. Breaklines will be added to better depict edge of drainage feature, road edges and other sharp breaks or discontinuities in the terrain. Data must meet or exceed NMAS vertical accuracies for 2-foot (1.0' RMSE). If requested, consultant will apply smoothing to create a more traditional looking contour dataset.

All contours will contain an elevation attribute that will hold the photogrammetrically obtained elevation. Every 10 feet will be an index contour, which will be identified with a heavier line. All contour lines will be solid and unbroken except where passing through dense ground cover, building, and under bridges. In these instances, the contour lines are still continuous, but they are attributed and displayed as broken/dashed lines.

4.2 3-D PLANIMETRICS

The consultant will map the following features for any requested areas. All features will be newly mapped by an automated process using the latest digital orthophotography and 0.5m LiDAR. None of the features will be mapped by stereo compilation or manual digitization. All line work will be smoothed to create a clean dataset. Elevation of features will be derived from LiDAR data used in the extraction process. If several of the features listed below are grouped together into a single layer, attribution for each feature type will be added.

- Buildings
- Lakes / Ponds / Streams
- Groups of Vegetation
- Unpaved Roads
- Driveways
- Pavement Pads
- Parking Lots
- Paved Roads
- Sidewalks
- Swimming Pools

4.3 IMPERVIOUS SURFACE LAYER

The consultant will create an impervious surface layers using orthophotography, 0.5m LiDAR and parcel data (if available). Impervious surfaces are defined as those polygonal features that significantly (but not absolutely) prevent the draining of storm water into the ground. Typically, these features include: buildings, building foundations, storage tanks, parking areas, roads, driveways, runways, taxiways, aprons, hardened athletic courts, patios, sidewalks (concrete or asphalt), concrete slabs surrounding swimming pools, and any other hardened (packed) surface.

Features that are typically not considered impervious include:

- fine gravel/sand surfaces not used for vehicular traffic or parking
- rock gardens or other areas landscaped with rocks
- junk automobiles or scrap piles
- railroad beds

Specifications

- The following specifications are based on source imagery captured at a scale of 1:1200 and containing a pixel resolution of 0.5'.
- Minimum Mapping Unit (MMU) of 100 sq. ft. (MMU is a target unit ... some polygons captured as part of an impervious data layer might be less than 100 sq. ft.)
- Sidewalks 5' or greater in width should be captured (with imagery resolution of 0.5').
- Circular portions of polygons should be captured so that the feature appears to be circular when viewed at a scale of 1:1200.
- All adjacent impervious polygons should be merged to form a single impervious polygon.
- Attempts should be made to fully captured features hidden by tree canopy, building shadow, or other obstacle by interpolating portions of hidden impervious surface areas.
- All features captured are based on aerial imagery interpretation. Field visits are not typically used to delineate impervious features.
- The following data dictionary will be used:

Surface Type	Surface Description
1	Existing Paving
2	Existing Gravel
3	Alley with Paving
4	Alley without Paving
5	Median
6	Asphalt Path
7	Concrete Pad
8	Hard Packed Gravel
9	Park
10	Parking Lot

11	Patio
12	Private Street
13	Misc
14	Sidewalk
15	Building
16	Railroad Hard Packed Gravel
17	Driveway
18	Existing Paving Bridge
19	Sidewalk Bridge
20	Pool

4.4 LANDCOVER/LANDUSE

Using the 2017 ortho-imagery, LiDAR and any available parcel data, the consultant will generate polygons representative of six land use classifications; Tillable, Pasture, Woodland, Wasteland, Urban and Water/Wetlands. A variation of the Anderson Schema will be used in order to define each landcover category.

- Tillable (Cropland) - Land used for crops.
- Pasture (Grassland Pasture) – ground or low vegetation located outside of the “Urban” classification.
- Woodland (Forest Land) – Areas of dense trees located outside of the “Urban” Classification.
- Wasteland – Any land not classified as Tillable, Pasture, Woodland, Water, or Urban.
- Developed – Urban or Built-up characterized by a high percentage (30 percent or greater) of constructed materials (e.g. asphalt, concrete, buildings, etc.).
- Low Intensity Residential - areas with a mixture of constructed materials and vegetation. Constructed materials account for 30-80 percent of the cover.
- High Intensity Residential - Includes highly developed areas where people reside in high numbers.

4.5 2-D PLANIMETRICS

The consultant will create 2D planimetrics for designated project areas. 2D planimetrics will be manually digitized or stereo compiled from the most recent Orthophotography available. All planimetric capture procedures will follow industry standards.

Project areas will vary from project to project. Project participants will be able to select what layer combinations they need digitized and whether the data will be newly created or added onto an existing planimetric layer. For updated layers, NCTCOG will provide the consultant with the latest planimetric data available to work from. If existing planimetric data is over 10 years old, consultant and NCTCOG will negotiate a fair update cost. Consultant will be expected to update data, not correct existing planimetric data. Planimetric data will be delivered in ESRI geodatabase format unless otherwise specified by NCTCOG.

Features	Feature Type	Description
Paved Road Edges	Polygon	Paved Road edges. Medians are included in road edges. Attribution should be included as to whether the medians are natural or man-made.
Paved Road Centerlines	Line	All paved road centerlines. Linework should be in a format that is compatible with NG911.
Unpaved Road Edges	Polygon	Public maintained road edges. Medians are included in road edges. Unpaved road edges are defined where the visible gravel edge ends.
Paved Parking lots	Polygon	Paved parking for 5 cars <i>or</i> more. All visible islands/meridians within paved parking lots are to be identified.
Buildings	Polygon	All buildings above 100 square feet in size. Capture will be of building footprint, not building roofline (unless specifically requested)
Bridges	Polygon	All visible bridges
Sidewalk CL	Line	Public, maintained paved sidewalk centerline
Sidewalk Edges	Polygon	Public, maintained paved sidewalk edge
Driveways	Polygon	Paved driveways
Fences	Line	Fences enclosing or dividing land or properties. Decorative fences within properties are not to be captured.
Tree Canopy	Polygon	Single or group of trees with canopy 100 feet in diameter or greater

Pavement Pad	Polygon	Paved or concrete pads such as concrete patios, RV pads, basketball courts, etc. 10' x 10' or 100'sq. ft. minimum size, does not include landscape block patios/pads or permeable surfaces.
Stream Centerline	Line	Centerline of visible streams at least 10 feet or greater in length
Stream Edges	Polygon	All visible stream edges at least 10 feet or greater in width
Lakes	Polygon	All visible lakes/ponds with <i>any</i> diameter 30 feet or greater or perimeter of 120 feet or greater.
Pools	Polygon	Below ground permanent swimming pools

4.6 OTHER DATA

The need may arise for one of the selected consultants to create another product not listed above. We have listed some of the more popular datasets in the pricing matrix for bidding purposes. For those that we do not have a negotiated price, NCTCOG will query one or more contracted consultants for price, schedule and methodology and make the best selection. The standards and deliverables applied to other derivatives will be used for any additional add-on projects. Potential add-ons may include, but are not limited to:

- Oblique Imagery
- 0.7 Meter LiDAR
- 1' Contours
- Solar Mapping
- Asset Management
- Geiger-Mode LiDAR
- Pavement Markings

SECTION 5 **DELIVERABLES**

5.1 Orthophotography

- Flight plan and control diagram in shapefile format
- Project Plan in PDF format
- One digital copy of the ground control and QA/QC points in shapefile format
- Survey Report in PDF format
- Weekly acquisition reports in shapefile format. Flight lines will be attributed with the date of acquisition
- Weather logs upon request
- Aerial Triangulation Report in PDF format
- Preliminary imagery provided in web mapping service
- Online QA/QC Tool which includes preliminary copy of unrectified images
- QA/QC Report
- One set of 1" = 100' scale color digital orthophotography at 0.5-foot pixel resolution for each tile in GeoTIFF format
- One set of 1" = 50' scale color digital orthophotography at 0.25-foot pixel resolution for each tile in GeoTIFF format
- One set of 1" = 100' scale color digital orthophotography at 0.5-foot pixel resolution for each tile in MrSID Generation 2 format
- One set of 1" = 50' scale color digital orthophotography at 0.25-foot pixel resolution for each tile in in Generation 2 format
- One set of 1" = 100' scale color digital orthophotography at 0.5-foot pixel resolution for each tile in MrSID Generation 4 format
- One set of 1" = 50' scale color digital orthophotography at 0.25-foot pixel resolution for each tile in MrSID Generation 4 format
- Final imagery provided in web mapping for service for two years following delivery. NCTCOG and consultant can negotiate longer WMS hosting period if so desired.
- FGCD Compliant Metadata
- Index shapefile that contains flight date information for each tile
- Final imagery delivered on external hard drive to NCTCOG and through cloud delivery platform (for a period of six months)

5.2 LiDAR

- Weekly acquisition reports will be provided as shapefiles. Flight lines will be attributed with the date of acquisition
- One digital copy of the ground control and QA/QC points in shapefile format
- Ground Survey Report in PDF format
- Project Report in PDF format
- QA/QC Report
- Classified LiDAR data in LAS 1.2 format. Georeference information will be included in the LAS header. Data will be clipped to match the NCTCOG tiling scheme.
- LiDAR data in ascii format
- The hydrologic breaklines compiled as part of the flattening process will be provided as a

shapefile deliverable

- One set of 8-bit gray scale intensity images, clipped to match the reference tiling scheme
- DEM Raster
- FGDC compliant metadata in XML format
- Final imagery delivered on external hard drive to NCTCOG and through cloud delivery platform (for a period of six months)

5.3 Contours

- Project Plan
- QA/QC Report
- Metadata
- Final dataset in ESRI geodatabase format

5.4 3-D Planimetrics

- Project Plan
- QA/QC Report
- Metadata
- Final dataset in ESRI geodatabase format

5.5 Impervious Surface

- Project Plan
- QA/QC Report
- Metadata
- Final dataset in ESRI geodatabase format



5.6 Landcover/Landuse

- Project Plan
- QA/QC Report
- Metadata
- Final dataset in ESRI geodatabase format

5.7 2-D Planimetrics

- Project Plan
- QA/QC Report
- Metadata
- Final dataset in ESRI geodatabase format

References

American Society for Photogrammetry & Remote Sensing. ASPRS Positional Accuracy Standards for Digital Geospatial Data. November 2014. http://www.asprs.org/wp-content/uploads/2015/01/ASPRS_Positional_Accuracy_Standards_Edition1_Version100_November2014.pdf

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Federal Geographic Data Committee. Geospatial Positioning Accuracy Standards Part 3: National Standard for Spatial Data Accuracy. 1998. <http://www.fgdc.gov/standards/projects/FGDC-standards-projects/accuracy/part3/chapter3>

Heidemann, Hans Karl. U.S. Geological Survey Lidar Base Specification Version 1.0. 17 August 2012. <http://pubs.usgs.gov/tm/11b4/>

Texas Water Development Board. Lidar Specifications Version 9. No Date. https://tnris.org/static/documents/stratmap/lidar_spec.pdf

Texas Water Development Board. Texas Orthoimagery Statement of Work v9. No Date. https://tnris.org/static/documents/stratmap/tx_orthoimagery_sow_v9.pdf

**EXHIBIT C:
PRICE PROPOSAL**

The attached pricing sheet should be included as part of the proposal and shall also be an attachment to the Master Agreement. Exceptions or features or services not anticipated by this sheet should be clearly stated.

Please leave blank any products you do not wish to bid for. All bid prices must be legible, otherwise they will not be considered. **If you would like your bid to be considered for both the SDCP and the SHARE portions of this proposal, please initial here:** _____

Bid Items listing: Spatial Data Cooperative Program RFQ #							
Issued: March 22, 2017							
			PROVIDE PRICE PER TIERED GROUP				
	<u>Description:</u>	<u>Unit</u>	<u>Square Miles 0-250</u>	<u>Square Miles 251-1000</u>	<u>Square Miles 1001-5000</u>	<u>Square Miles 5001- 10,000</u>	<u>Square Miles >10,000</u>
1	3" Frame Orthophotography	Sq. Mile					
2	6" Frame Orthophotography	Sq. Mile					
3	6" Pushbroom Orthophotography	Sq. Mile					
4	6" Oblique Imagery	Sq. Mile					
5	0.5 Meter LiDAR with Classified Buildings (100%)	Sq. Mile					
6	Geiger-Mode LiDAR	Sq. Mile					
7	2' Contours	Sq. Mile					
8	1' Contours	Sq. Mile					
9	3D Planimetrics	Sq. Mile					
10	Impervious Surface Layer	Sq. Mile					

11	Landcover/Landuse	Sq. Mile					
Bid Items listing: Spatial Data Cooperative Program RFQ #							
Issued: March 22, 2017							
			PROVIDE PRICE PER TIERED GROUP				
	<u>Description:</u>	<u>Unit</u>	<u>Urban/Rural % (20/80)</u>	<u>Urban/Rural % (40/60)</u>	<u>Urban/Rural % (60/40)</u>	<u>Urban/Rural % (80/20)</u>	<u>Urban/Rural % (100/0)</u>
12	New 2D Planimetrics - Bundle (building footprints, paved road edges, parking lots, bridges, sidewalk centerlines)	Sq. Mile					
13	New 2D Planimetrics - Building Footprints	Sq. Mile					
14	New 2D Planimetrics - Paved Road Edges	Sq. Mile					
15	New 2D Planimetric - Paved Road Centerlines	Sq. Mile					
16	New 2D Planimetrics - Unpaved Road Edges	Sq. Mile					
17	New 2D Planimetrics - Parking Lots	Sq. Mile					
18	New 2D Planimetrics - Bridges	Sq. Mile					
19	New 2D Planimetrics - Sidewalk Edges	Sq. Mile					
20	New 2D Planimetrics - Sidewalk Centerlines	Sq. Mile					
21	New 2D Planimetrics - Driveways	Sq. Mile					
22	New 2D Planimetrics - Fences	Sq. Mile					

23	New 2D Planimetrics - Pavement Pads	Sq. Mile					
24	New 2D Planimetrics - Swimming Pools	Sq. Mile					
25	New 2D Planimetrics - Tree Canopy	Sq. Mile					
26	New 2D Planimetrics - Lake Edges	Sq. Mile					
27	New 2D Planimetrics - Stream Edges	Sq. Mile					
28	New 2D Planimetrics - Stream Centerlines	Sq. Mile					
29	Updated 2D Planimetrics - Bundle (building footprints, road edges, parking lots, bridges, sidewalk centerlines)	Sq. Mile					
30	Updated 2D Planimetrics - Building Footprints	Sq. Mile					
31	Updated 2D Planimetrics - Paved Road Edges	Sq. Mile					
32	Updated 2D Planimetrics - Paved Road Centerlines	Sq. Mile					
33	Updated 2D Planimetrics - Unpaved Road Edges	Sq. Mile					
34	Updated 2D Planimetrics - Parking Lots	Sq. Mile					
35	Updated 2D Planimetrics - Bridges	Sq. Mile					
36	Updated 2D Planimetrics - Sidewalk Edges	Sq. Mile					
37	Updated 2D Planimetrics - Sidewalk Centerlines	Sq. Mile					
38	Updated 2D Planimetrics - Driveways	Sq. Mile					

39	Updated 2D Planimetrics - Fences	Sq. Mile					
40	Updated 2D Planimetrics - Pavement Pads	Sq. Mile					
41	Updated 2D Planimetrics - Swimming Pools	Sq. Mile					
42	Updated 2D Planimetrics - Tree Canopy	Sq. Mile					
43	Updated 2D Planimetrics - Lake Edges	Sq. Mile					
44	Updated 2D Planimetrics - Stream Edges	Sq. Mile					
45	Updated 2D Planimetrics - Stream Centerlines	Sq. Mile					

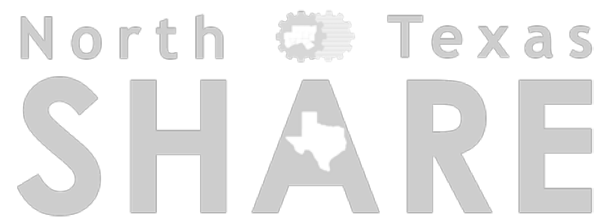


EXHIBIT D: GLOSSARY OF TERMS

Accuracy – The degree of conformity of a measured or calculated value compared to the actual value. Accuracy relates to the quality of a result and is distinguished from precision, which relates to the quality of the operation by which the result is obtained.

Deliverable(s) – Geospatial data, reports, and/or information/documents that are developed according to a defined set of specifications and delivered under the terms of a contractual agreement or task order.

Digital Elevation Model (DEM) – a digital model or 3-D representation of a terrain's surface.

- *Digital terrain model (DTM)* – a bare-earth model in which cultural features such as buildings, roads, and vegetation canopy are digitally removed using processing software.
- *Digital surface model (DSM)* – a first-reflective-surface model that contains cultural features such as buildings, roads, vegetation, and natural terrain features.

Georeference – To associate data and information with a location in physical space; one example is, determining and establishing the mathematical relationship of vector features, raster images and other geographical features to map projections or coordinate systems.

Geospatial accuracy – Accuracy of geospatial mapping data and information. Map accuracies include both positional accuracies and thematic accuracies:

- *Positional accuracy* – Accuracy of the horizontal and/or vertical coordinates that define the location of features represented by geospatial maps, data or information.
- *Thematic accuracy* – Accuracy of the feature characteristics or attributes represented by the geospatial maps, data or information.

Ground Control – Previously georeferenced feature(s) which include metadata that references the accuracy, collection procedures, methodologies, and/or source data.

Hosted / Online / Cloud Data – Defined as Data as a Service (DaaS), this refers to the data product that can be provided under a subscription model and may be provided under a Software as a Service (SaaS) application.

Land Use – Data that documents how much of a region is covered by forests, wetlands, impervious surfaces, agriculture, and other land and water types. Areas are classified through common pixel values from a remotely sensed image.

Oblique images – An aerial photograph taken with the optical axis of the camera deliberately pointed away from the vertical. Oblique photographs could therefore be defined as photographs usually taken with the optical axis more than 5° from the vertical. Enables at-an-angle view of properties, etc.; from different directions.

Orthophotograph – A photograph prepared from a perspective photograph by removing those displacements of points caused by tilt, topographic relief and central projection (perspective). Sometimes called an orthophoto map, an orthophoto is georeferenced and is geometrically corrected

such that the scale is uniform: the photo has the same lack of distortion as a map and can be used to measure distances, locations, angles, and the relationships between objects on the earth, to within a specified accuracy. Accuracy depends on process and project design parameters.

Parcel Data – Parcel data includes attributes such as property description, zoning, ownership, and appraised or market value. These data sets are typically available by city, county or state. A parcel is a single piece of land described in a single description in a deed or as one of a number of lots on a plat, separately owned either publicly or privately and capable of being conveyed separately.

Planimetrics – Geographic objects, natural and cultural physical features, and entities without topographic features such as roads, buildings, and water bodies that are visible and identifiable on aerial photographs, but which can be compiled into map features through photogrammetric or surveying procedures. Planimetric data ensures horizontal accuracy in distances between features.



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