**United States Government**
**Interagency Agreement (IAA) – Agreement Between Federal Agencies**
## General Terms and Conditions (GT&C) Section

IAA Number 67-6526-16-501 (GT&C #) - 0000 - (Order #) _____ (Amendment/Mod #)

| DEPARTMENT AND/OR AGENCY | | | |
|---|---|---|---|
| 1. | | **Requesting Agency of Products/Services** | **Servicing Agency Providing Products/Services** |
| | Name | USDA-NRCS Nebraska State Office | USGS, NGTOC |
| | Address | 100 Centennial Mall N Ste 152<br>Lincoln, NE 68508 | 1400 Independance Rd., MS323<br>Rolla, MO 65401 |

**2. Servicing Agency Agreement Tracking Number** (Optional) _____

**3. Assisted Acquisition Agreement** Yes ☑ No ☐

**4. GT&C Action** (Check action being taken)

☑ **New**

☐ **Amendment** – Complete only the GT&C blocks being changed and explain the changes being made.

☐ **Cancellation** – Provide a brief explanation for the IAA cancellation and complete the effective End Date.

**5. Agreement Period** Start Date upon date of final signature (MM-DD-YYYY) End Date 09-30-2018 (MM-DD-YYYY) of IAA or effective cancellation date

**6. Recurring Agreement** (Check One) A Recurring Agreement will continue, unless a notice to discontinue is received.

Yes ☐ If **Yes,** is this an: Annual Renewal ☐ Other Renewal ☐ State the other renewal period: _____

No ☑

**7. Agreement Type** (Check One) ☑ Single Order IAA ☐ Multiple Order IAA

**8. Are Advance Payments Allowed for this IAA** (Check One) ☐ Yes ☑ No

If Yes is checked, enter Requesting Agency's Statutory Authority Title and Citation

Note: Specific advance amounts will be captured on each related Order.

**United States Government**
**Interagency Agreement (IAA) – Agreement Between Federal Agencies**
## General Terms and Conditions (GT&C) Section

IAA Number 67-6526-16-501 (GT&C #) - 0000 - (Order #) _____ (Amendment/Mod #)

**9. Estimated Agreement Amount** (The Servicing Agency completes all information for the estimated agreement amount.)

**(Optional for Assisted Acquisitions)**

| | |
|---|---|
| Direct Cost | $3,047,619.05 |
| Overhead Fees & Charges | $152,380.95 |
| Total Estimated Amount | $3,200,000.00 |

Provide a general explanation of the Overhead Fees & Charges

Geospatial Product and Sercive Contract (GPSC) assessment fee as calculated by USGS as 5% of the total contracted project cost.

**10. STATUTORY AUTHORITY**

**a. Requesting Agency's Authority** (Check One)

| Franchise Fund | Revolving Fund | Working Capital Fund | Economy Act (31 U.S.C. 1535/FAR 17.5) | Other Authority |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☑ |

**Fill in Statutory Authority Title and Citation** for Franchise Fund, Revolving Fund, Working Capital Fund, or Other Authority
Soil Survey Program 16 USC 590a-f, 42 USC 3271-32 (CFDA 10.93)

**b. Servicing Agency's Authority** (Check One)

| Franchise Fund | Revolving Fund | Working Capital Fund | Economy Act (31 U.S.C. 1535/FAR 17.5) | Other Authority |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☑ |

**Fill in Statutory Authority Title and Citation** for Franchise Fund, Revolving Fund, Working Capital Fund, or Other Authority
Soil Survey Program 16 USC 590a-f, 43 USC 36 c

**11. Requesting Agency's Scope** (State and/or list attachments that support Requesting Agency's Scope.)

Attachments:

Statement of Work - Nebraska LiDAR Completion Project

**12. Roles & Responsibilities for the Requesting Agency and Servicing Agency** (State and/or list attachments for the roles and responsibilities for the Requesting Agency and the Servicing Agency.)

Attachment: Statement of Work for Agreement between NRCS and USGS

**United States Government**
**Interagency Agreement (IAA) – Agreement Between Federal Agencies**
## General Terms and Conditions (GT&C) Section

IAA Number 67-6526-16-501 - 0000 - _____
GT&C # Order # Amendment/Mod #

**13. Restrictions** (Optional) (State and/or attach unique requirements and/or mission specific restrictions specific to this IAA).
N/A

**14. Assisted Acquisition Small Business Credit Clause** (The Servicing Agency will allocate the socio-economic credit to the Requesting Agency for any contract actions it has executed on behalf of the Requesting Agency.)

**15. Disputes:** Disputes related to this IAA shall be resolved in accordance with instructions provided in the Treasury Financial Manual (TFM) Volume I, Part 2, Chapter 4700, Appendix 10; Intragovernmental Business Rules.

**16. Termination** (Insert the number of days that this IAA may be terminated by written notice by either the Requesting or Servicing Agency.)

30

If this agreement is canceled, any implementing contract/order may also be canceled. If the IAA is terminated, the agencies shall agree to the terms of the termination, including costs attributable to each party and the disposition of awarded and pending actions.

**If the Servicing Agency incurs costs due to the Requesting Agency's failure to give the requisite notice of its intent to terminate the IAA, the Requesting Agency shall pay any actual costs incurred by the Servicing Agency as a result of the delay in notification, provided such costs are directly attributable to the failure to give notice.**

**17. Assisted Acquisition Agreements – Requesting Agency's Organizations Authorized To Request Acquisition Assistance for this IAA.** (State or attach a list of Requesting Agency's organizations authorized to request acquisition assistance for this IAA.)
USDA NRCS National Servicing Contracting Branch
USDA NRCS Nebraska State Office

**18. Assisted Acquisition Agreements – Servicing Agency's Organizations authorized to Provide Acquisition Assistance for this IAA.** (State or attach a list of Servicing Agency's organizations authorized to provide acquisition for this IAA.)
USGS National Servicing Contracting Branch

**19. Requesting Agency Clause(s)** (Optional) (State and/or attach any additional Requesting Agency clauses.)
N/A

**United States Government**
**Interagency Agreement (IAA) – Agreement Between Federal Agencies**
## General Terms and Conditions (GT&C) Section

IAA Number 67-6526-16-501 - 0000 - _____
GT&C # Order # Amendment/Mod #

**20. Servicing Agency Clause(s)** (Optional) (State and/or attach any additional Servicing Agency clauses.)
N/A

**21. Additional Requesting Agency and/or Servicing Agency Attachments** (Optional) (State and/or attach any additional Requesting Agency and/or Servicing Agency attachments.)
N/A

**22. Annual Review of IAA**

By signing this agreement, the parties agree to annually review the IAA if the agreement period exceeds one year. Appropriate changes will be made by amendment to the GT&C and/or modification to any affected Order(s).

**AGENCY OFFICIAL**

The Agency Official is the highest level accepting authority or official as designated by the Requesting Agency and Servicing Agency to sign this agreement. Each Agency Official must ensure that the general terms and conditions are properly defined, including the stated statutory authorities, and, that the scope of work can be fulfilled per the agreement.

The Agreement Period Start Date (Block 5) must be the same as or later than the signature dates.

Actual work for this IAA may NOT begin until an Order has been signed by the appropriate individuals, as stated in the Instructions for Blocks 37 and 38.

| 23. | Requesting Agency | Servicing Agency |
|---|---|---|
| Name | Craig Derickson | Kari J. Craun |
| Title | State Conservationist | Director, USGS-NGTOC |
| Telephone Number(s) | (402) 437-5300 | (573) 308-3802 |
| Fax Number | (402) 437-5327 | |
| Email Address | craig.derickson@ne.usda.gov | kcraun@usgs.gov |
| SIGNATURE | CRAIG DERICKSON Digitally signed by CRAIG DERICKSON DN: c=US, o=U.S. Government, ou=Department of Agriculture, cn=CRAIG DERICKSON, 0.9.2342.19200300.100.1.1=12001000232016 Date: 2016.07.29 08:52:09 -05'00' | KARI CRAUN Digitally signed by KARI CRAUN DN: c=US, o=U.S. Government, ou=Department of the Interior, ou=Geological Survey, cn=KARI CRAUN, 0.9.2342.19200300.100.1.1=14001000295101 Date: 2016.07.27 16:43:57 -05'00' |
| Approval Date | | |

# United States Government
## Interagency Agreement (IAA) – Agreement Between Federal Agencies
## Order Requirements and Funding Information (Order) Section

IAA Number 67-6526-16-501 - _____ - _____ Servicing Agency's Agreement Tracking Number (Optional) _____
GT&C # Order # Amendment/Mod #

| PRIMARY ORGANIZATION/OFFICE INFORMATION | | |
|---|---|---|
| **24.** | **Requesting Agency** | **Servicing Agency** |
| Primary Organization/Office Name | USDA-NRCS Nebraska State Office | USGS, NGTOC |
| Responsible Organization/Office Address | 100 Centennial Mall N Ste 152<br>Lincoln, NE 68508 | 1400 Independance Rd., MS323<br>Rolla, MO 65401 |

**ORDER/REQUIREMENTS INFORMATION**

**25. Order Action** (Check One)

☑ **New**

☐ **Modification** (Mod) – List affected Order blocks being changed and explains the changes being made. For Example: for a performance period mod, state new performance period for this Order in Block 27. **Fill out the Funding Modification Summary by Line** (Block 26) if the mod involves adding, deleting or changing **Funding for an Order Line**.

☐ **Cancellation** – Provide a brief explanation for Order cancellation and fill in the Performance Period End Date for the effective cancellation date.

| **26. Funding Modification Summary by Line** | Line # _____ | Line # _____ | Line # _____ | Total of All Other Lines (attach funding details) | Total |
|---|---|---|---|---|---|
| Original Line Funding | $ | $ | $ | $ | $0.00 |
| Cumulative Funding Changes From Prior Mods [addition (+) or reduction (-)] | $ | $ | $ | $ | $ 0.00 |
| Funding Change for This Mod | $ | $ | $ | $ | $ 0.00 |
| TOTAL Modified Obligation | $ 0.00 | $ 0.00 | $0.00 | $ 0.00 | $0.00 |
| Total Advance Amount (-) | $ | $ | $ | $ | $ 0.00 |
| Net Modified Amount Due | $ 0.00 | $0.00 | $0.00 | $ 0.00 | $0.00 |

**27. Performance Period**
For a performance period mod, insert the start and end dates that reflect the new performance period.

Start Date: Upon date of final signature (MM-DD-YYYY) End Date: 09-30-2018 (MM-DD-YYYY)

## IAA Order

IAA Number 67-6526-16-501 - _____ - _____ Servicing Agency's Agreement Tracking Number (Optional) _____
GT&C # Order # Amendment/Mod #

**28. Order Line/Funding Information** **Line Number** 1

| | Requesting Agency Funding Information | | | | | | | | Servicing Agency Funding Information | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ALC | 12401600 | | | | | | | | | | | | | | | |
| Component TAS Required by 10/1/2014 | SP | ATA | AID | BPOA | EPOA | A | MAIN | SUB | SP | ATA | AID | BPOA | E POA | A | MAIN | SUB |
| | | | | | | | | | | | | | | | | |
| OR Current TAS format | 12X1004 & 126/71000 | | | | | | | | 145/60804 | | | | | | | |
| BETC | DISB | | | | | | | | COLL | | | | | | | |
| Object Class Code (Optional) | 2510 | | | | | | | | | | | | | | | |
| BPN | ~~19603540~~ 196035430 | | | | | | | | 195964445 | | | | | | | |
| BPN + 4 (Optional) | | | | | | | | | | | | | | | | |
| Additional Accounting Classification/Information (Optional) | See block 35 for WBS breakdown on fund codes. TPN: 1240 | | | | | | | | TPN:1408 | | | | | | | |

Requesting Agency Funding Expiration Date 09-30-2016 MM-DD-YYYY

Requesting Agency Funding Cancellation Date 09-30-2018 MM-DD-YYYY

Nebraska LiDAR Completion Project
**Project Number & Title**

**Description of Products and/or Services, including the Bona Fide Need for this Order** (State or attach a description of products/services, including the bona fide need for this Order.)
The purpose of this agreement is to secure contracting services for high resolution elevation data (LiDAR) in order to comply with the Brooks Act. Under the IAA, the USGS through their existing GPSC Contract, shall provide the acquisition and processing of LiDAR data in several areas in the State of Nebraska where high-resolution digital topographic data will assist the Natural Resources Conservation Service (NRCS) in conservation planning, design, research, delivery, floodplain mapping, dam safety assessments, and hydrologic modeling.

North American Industry Classification System (NAICS) Number (Optional) _____

**Breakdown of Reimbursable Line Costs**

| Unit of Measure | | |
|---|---|---|
| Quantity | Unit Price | **Total** |
| | | $ 0.00 |
| Overhead Fees & Charges | | $ |
| Total Line Amount Obligated | | $ 0.00 |
| Advance Line Amount (-) | | $ |
| Net Line Amount Due | | $ 0.00 |

**OR** **Breakdown of Assisted Acquisition Line Cost:**

| | |
|---|---|
| Contract Cost | $ 3,047,619.05 |
| Servicing Fees | $ 152,380.95 |
| Total Obligated Cost | $ 3,200,000.00 |
| Advance for Line (-) | $ |
| Net Total Cost | $ 3,200,000.00 |

Assisted Acquisition Servicing Fees Explanation
Geospatial Product and Service Contract (GPSC) assessment fee as calculated by USGS as 5% of the total contracted project cost.

**Type of Service Requirements**

☐ Severable Service ☑ Non-severable Service ☐ Not Applicable

## IAA Order

IAA Number 67-6526-16-501 - _____ - _____ Servicing Agency's Agreement Tracking Number (Optional) _____
GT&C # Order # Amendment/Mod #

**29. Advance Information** (Complete Block 29 if the Advance Payment for Products/Services was checked "Yes" on the GT&C.)

**Total Advance Amount for the Order $**_____ [All Order Line advance amounts (Block 28) must sum to this total.]

**Revenue Recognition Methodology** (according to SFFAS 7) (Identify the Revenue Recognition Methodology that will be used to account for the Requesting Agency's expense and the Servicing Agency's revenue)

☐ Straight-line – Provide amount to be accrued $_____ and Number of Months _____

☐ Accrual Per Work Completed – Identify the accounting posting period:

☐ Monthly per work completed & invoiced

☐ Other – Explain other regular period (bimonthly, quarterly, etc.) for posting accruals and how the accrual amounts will be communicated if other than billed. _____

**30. Total Net Order Amount:** $ 3,200,000.00
[All Order Line Net Amounts Due for reimbursable agreements and Net Total Costs for Assisted Acquisition Agreements (Block 28) must sum to this total.]

**31. Attachments** (State or list attachments.)

☑ Key project and/or acquisition milestones (Optional except for Assisted Acquisition Agreements)
Statement of Work - Nebraska LiDAR Completion Project

☑ Other Attachments (Optional)
Statement of Work for Agreement between NRCS and USGS

### BILLING & PAYMENT INFORMATION

**32. Payment Method** (Check One) [**Intra-governmental Payment and Collection (IPAC)** is the Preferred Method.]
If IPAC is used, the payment method must agree with the IPAC Trading Partner Agreement (TPA).

☐ Requesting Agency Initiated IPAC ☑ Servicing Agency Initiated IPAC
☐ Credit Card ☐ Other – Explain other payment method and reasoning _____

**33. Billing Frequency** (Check One)

**[An Invoice must be submitted by the Servicing Agency and accepted by the Requesting Agency BEFORE funds are reimbursed (i.e., via IPAC transaction)]**

☐ Monthly ☑ Quarterly ☐ Other Billing Frequency (include explanation)_____

**34. Payment Terms** (Check One)

☐ 7 days ☑ Other Payment Terms (include explanation): 30 days

## IAA Order

IAA Number 67-6526-16-501 - _____ - _____ Servicing Agency's Agreement Tracking Number (Optional) _____
GT&C # Order # Amendment/Mod #

**35. Funding Clauses/Instructions** (Optional) (State and/or list funding clauses/instructions.)

NR.SI.CSTP.31.0000.16XXT $1,700,000
NR.SI.EQIP.31.0000.16XXT $ 750,000
NR.SI.COTA.31.0000.1617T $ 750,000

**36. Delivery/Shipping Information for Products** (Optional)

| | |
|---|---|
| Agency Name | USDA-NRCS |
| Point of Contact (POC) Name & Title | Shandy Bittle, State GIS Specialist |
| POC Email Address | shandy.bittle@ne.usda.gov |
| Delivery Address /Room Number | 100 Centennial Mall N. Ste 152, Lincoln, NE 68508 |
| POC Telephone Number | (402) 437-4020 |
| Special Shipping Information | |

### APPROVALS AND CONTACT INFORMATION

**37. PROGRAM OFFICIALS**

The Program Officials, as identified by the Requesting Agency and Servicing Agency, must ensure that the scope of work is properly defined and can be fulfilled for this Order. The Program Official may or may not be the Contracting Officer depending on each agency's IAA business process.

| | Requesting Agency | Servicing Agency |
|---|---|---|
| Name | Neil Dominy | Mark Gewinner |
| Title | State Soil Scientist | Agreements Coordinator |
| Telephone Number | (402) 437-4113 | (573) 308-3636 |
| Fax Number | (402) 437-5327 | (573) 308-3652 |
| Email Address | neil.dominy@ne.usda.gov | mgewinner@usgs.gov |
| SIGNATURE | DANIEL SHURTLIFF | MARK GEWINNER |
| Date Signed | | |

**38. FUNDING OFFICIALS** - The Funds Approving Officials, as identified by the Requesting Agency and Servicing Agency, certify that the funds are accurately cited and can be properly accounted for per the purposes set forth in the Order. The Requesting Agency Funding Official signs to obligate funds. The Servicing Agency Funding Official signs to start the work, and to bill, collect, and properly account for funds from the Requesting Agency, in accordance with the agreement.

| | Requesting Agency | Servicing Agency |
|---|---|---|
| Name | Craig Derickson | Kari J. Craun |
| Title | State Conservationist | Director, USGS-NGTOC |
| Telephone Number | (402) 437-5300 | (573) 308-3802 |
| Fax Number | | |
| Email Address | craig.derickson@ne.usda.gov | kcraun@usgs.gov |
| SIGNATURE | CRAIG DERICKSON | KARI CRAUN |
| Date Signed | | |

## IAA Order

IAA Number 67-6526-16-501 - _____ - _____
GT&C # Order # Amendment/Mod #

Servicing Agency's Agreement Tracking Number (Optional) _____

| CONTACT INFORMATION | | |
|---|---|---|
| **FINANCE OFFICE Points of Contact (POCs)**<br>The finance office points of contact must ensure that the payment (Requesting Agency), billing (Servicing Agency), and advance/accounting information are accurate and timely for this Order. | | |
| **39.** | **Requesting Agency (Payment Office)** | **Servicing Agency (Billing Office)** |
| Name | USDA-NRCS NAPST Branch Office | Deborah Prater |
| Title | National Accounts Payable Service Team | Financial Analyst |
| Office Address | | 1400 Independence Rd., MS318<br>Rolla, MO 65401 |
| Telephone Number | | (573) 308-3643 |
| Fax Number | | (573) 308-3652 |
| Email Address | https://ems-team.usda.gov/sites/NRCS_GF | dprater@usgs.gov |
| Signature & Date (Optional) | | |

**40. ADDITIONAL Points of Contacts (POCs)** (as determined by each Agency)
This may include CONTRACTING Office Points of Contact (POCs).

| | **Requesting Agency** | **Servicing Agency** |
|---|---|---|
| **Name** | Julie Crew | Tim Saultz |
| Title | ASTC- Management and Strategy | Contracting Officer's Technical Representative |
| Office Address | 100 Centennial Mall N Ste 152<br>Lincoln, NE 68508 | 1400 Independence Rd., MS670<br>Rolla, MO 65401 |
| Telephone Number | (402) 437-4131 | (573) 308-3654 |
| Fax Number | (402) 437-5327 | |
| Email Address | julie.crew@ne.usda.gov | tsaultz@usgs.gov |
| Signature & Date (Optional) | JULIE CREW | |
| **Name** | G. Darin Wilson | |
| Title | Grants Management Specialist | |
| Office Address | 501 West Felix Street, Bldg. 23<br>Fort Worth, Texas 76115 | |
| Telephone Number | (817) 509-3503 | |
| Fax Number | | |
| Email Address | george.wilson@wdc.usda.gov | |
| Signature & Date (Optional) | GEORGE WILSON | |
| **Name** | | |
| Title | | |
| Office Address | | |
| Telephone Number | | |
| Fax Number | | |
| Email Address | | |
| Signature & Date (Optional) | | |

# DETERMINATION AND FINDINGS (D&F)
# AUTHORITY TO ENTER INTO AN INTERAGENCY AGREEMENT FOR ACQUISITION SERVICES PURSUANT TO THE ECONOMY ACT

Based on the following determination and findings, in accordance with the authority of the Economy Act (31 USC 1535), as implemented in the Federal Acquisition Regulation,
Subpart 17.5, *USDA-NRCS Nebraska*, intends to enter into an interagency agreement with the *USGS*.

*USDA-NRCS Nebraska* certifies:

__x__ that sufficient funding amounts are available;
__x__ that this agreement is in the best interest of the United States Government;
__x__ the agency to fill the order is able to provide or get by contract the ordered goods or services; and
__x__ that the services requested cannot be provided by contract as conveniently or cheaply by a commercial enterprise.

CRAIG DERICKSON

Signature of USDA official who has authority to sign this D&F
Name: Craig Derickson
Title and office: State Conservationist, Nebraska
Date: 07/12/2016

It has been determined that this Economy Act order:

_____ Does not require contracting action by the Servicing Agency; or

__x__ Does require contracting action by the Servicing Agency and that one of the following circumstances exists *[Place a check in each space that applies]*:

x____ the acquisition will appropriately be made under an existing contract of the Servicing Agency, entered into before placement of the order, to meet the requirements of the Servicing Agency for the same or similar supplies or services;

x____ the Servicing Agency has capabilities or expertise to enter into a contract for such supplies or services which is not available within the requesting agency; or

_____ the Servicing Agency is specifically authorized by law or regulation, *i.e.*, *[set forth the citation for the law or regulation]*, to purchase such supplies or services on behalf of other agencies.

HEIDI ATKINSON

Digitally signed by HEIDI ATKINSON
DN: c=US, o=U.S. Government, ou=Department of Agriculture, cn=HEIDI ATKINSON, 0.9.2342.19200300.100.1.1=12001003247385
Date: 2016.07.13 18:57:09 -04'00'

Signature of USDA contracting officer designated to sign the D&F
Name
Title and office
Date: _____

# PART 1

# STATEMENT OF WORK

**STATEMENT OF WORK FOR INTERAGENCY AGREEMENT**
**67-6526-16-501**
**UNITED STATES GEOLOGICAL SURVEY (USGS)**

I. AUTHORITIES

NRCS authority to enter this agreement is the Soil Survey Program, 16 U.S.C. 590a-f, 42 U.S.C. 3271-3274 (CFDA 10.903); Soil and Water Resources Conservation Program, 16 U.S.C. 2001-2009 (CFDA 10.902); Highly Erodible Land and Wetland Conservation, 16 U.S.C 3801 et seq., 7 CFR Part 12 (CFDA 10.902); Watershed Rehabilitation Program, 16 U.S.C. 1012 (CFDA 10.916).

II. PURPOSE

This Interagency Agreement between the United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) and the United States Geological Survey (USGS) will provide funding for USGS to contract LiDAR for several areas in Nebraska via the USGS GPSC contract.

III. OBJECTIVES

The entities listed above have shown interest in acquiring detailed surface elevation data for use in fulfilling the mutual interest and benefits of all partners in conservation planning, design, research, delivery, floodplain mapping, dam safety assessments, and hydrologic modeling. Highly accurate surface elevation data can be obtained through the use of LIDAR (LIght Detection and Ranging) technology. Topographical data can be cost-effectively obtained by gathering LIDAR data on the thousands of square miles of interest to the entities listed above. The entities wish to pursue the creation of an agreement to acquire and process LIDAR data, and develop, maintain and distribute databases.

The overall goal of the Nebraska LiDAR Project is to acquire highly accurate surface elevation data through the use of LIDAR (LIght Detection and Ranging) technology. Specifically, this agreement will provide funding to USGS to support the acquisition, project management, and QA\QC of the project.

Definitions

*LIDAR* (Light Detection and Ranging, also known as Airborne Laser Swath Mapping or ALSM) - a technology that employs an airborne scanning laser rangefinder to produce detailed and accurate topographic surveys. LIDAR can be used to accurately measure the topography of the ground, even where overlying vegetation is quite dense.

## IV. RESPONSIBILITIES OF THE PARTIES

The United States Geological Survey (USGS) will:

A. Provide Program Management and oversight to manage elevation data acquisition.

B. Financial/Budget management to ensure that funding is spent effectively and efficiently, and to ensure that the funding goes to the correct sources.

C. Ensuring that the final product meets specifications as defined. The USGS also works directly with the vendor(s) if there are quality issues, and will work with reimbursable partners to confirm whether certain quality issues are sufficient to cause rejection.

D. Liaisons with state and local governments to find the most reasonable and least expensive method of accomplishing the requirements by cost sharing.

The Natural Resources Conservation Service (NRCS) will:

A. Provide funding of $3,200,000 for the purposes of procuring LiDAR for several areas in Nebraska.

B. Provide scopes of work for task orders to be issued for $3,200,000

## V. EXPECTED ACCOMPLISHMENTS AND DELIVERABLES

LiDAR Data Acquisition (Fall 2016 and Spring 2017)

Quality Assurance by USGS NGTOC

LiDAR data will be acquired by a private vendor who will be chosen by the Partners based on their qualifications and availability on an available contract. Data will be acquired to specifications that comply with USGS standards and are agreeable to all Partners.

LiDAR acquisition will occur in Fall 2016 and Spring 2017. Final deliverables will be distributed once the data has been accepted by USGS, approximately 5 weeks after the final delivery of data from the LiDAR vendor.

Once the data is approved by USGS, the data is considered accepted.

LiDAR Data acquisition will meet USGS standards. Qualitative accuracy assessment of LiDAR will be completed following the 1998 National Standard for Spatial Data Accuracy (NSSDA). Metadata for all products will be FDGC compliant.

## VI. PERIOD OF PERFORMANCE

This agreement is effective upon date of final signature and remains in effect until September 30, 2018.

VII. RESOURCES REQUIRED

LiDAR Data acquisition will meet USGS standards. Qualitative accuracy assessment of LiDAR will be completed following the 1998 National Standard for Spatial Data Accuracy (NSSDA). Metadata for all products will be FDGC compliant.

VIII. Points of Contact

The following individuals will be the points of contact for this agreement:
USGS:
Mark Gewinner
Agreements Coordinator/Program Manager
U.S. Geological Survey, NGTOC
1400 Independence Rd., MS323
Rolla, MO 65401
phone: (573)308-3636
fax: (573)308-3652

NRCS Technical:
Neil Dominy, State Soil Scientist
Natural Resources Conservation Service
100 Centennial Mall N, Rm 152
Lincoln, NE 68508
Phone: 402-437-4113
Fax: 402-437-5327
Email: neil.dominy@ne.usda.gov

Each Party shall promptly notify the other Party in writing in the event of a change in the designated point of contact.

This agreement will be reviewed at the completion of the project or at the request of either party, for possible extension or modification, as appropriate.

This agreement may be modified at any time upon joint approval, or may be terminated by either agency upon 30 days written notice or at any time by mutual consent.

**SCOPE OF WORK**

**High Resolution Digital LiDAR Data Acquisition and Processing for portions of Nebraska 2016-2017**

**8-JUN-2016**

**Background and Project Information**

The Nebraska USDA-NRCS requires high-resolution digital elevation data developed from airborne LIDAR for an area of approximately 18,111 square miles in Nebraska (Appendix). The data will be used by the USDA-NRCS to generate digital elevation models and contours for use in dam safety assessments, engineering design and design reviews, conservation planning, research, delivery, floodplain mapping, and hydrologic modeling utilizing LiDAR technology. The data is to be acquired between Fall 2016 and Spring 2017. The project area will consist of high accuracy classified bare-earth LiDAR data in LAS format as well as raster Digital Elevation Models (DEMs) per project requirements. The project data will be edge-matched to current Nebraska LiDAR data.

Unless otherwise stated, the USGS-NGP Lidar Base Specifications (Techniques and Methods 11–B4, Version 1.2, November 2014) for Quality Level Two (QL2) will define the technical requirements for the project area(s).

## 1 General Requirements

### 1.1 Project Area

The project consists of 18,111 square miles in north central Nebraska as shown in the Appendix and available in Esri shapefile format.

Specific details for collection will follow in the General Requirements.

### 1.2 Project Initiation Plan

A detailed project plan must be submitted for approval within 10 days of receiving notice to proceed and prior to any data acquisition activities. The plan shall consist of the following:

- Schedule (data acquisition, data processing, data delivery)

- Project personnel with contact information of the project and field operation manager(s)
- Proposed flight lines in GIS and graphic format
- Base station locations in GIS and graphic format as well as supporting NGS control information
- Proposed baseline lengths for aerial collection
- Calibration testing methodology(s)
- LiDAR collection parameters (flying height, Scan FOV full angle, pulse rate, scanner frequency, side-lap percentage, point density etc.)
- Proposed acquisition windows including maximum PDOP values
- Description of internal verification quality control processes;
  - Data validation
  - Pre-processing and accuracy check
  - Processing quality control
  - Product delivery quality control

## 1.3 LiDAR Data Acquisition Parameters

LiDAR data shall be collected using an approved fully calibrated system capable of collecting multiple echoes per pulse with a minimum of a first, last, and one intermediate return. The system must also be able to collect the intensity (LiDAR pulse signal strength) for each return signal.

### 1.3.1 Sensor Calibration

Full system calibration and routine maintenance should be up-to-date to ensure full functionality of the LiDAR system to meet and exceed project accuracies and requirements. Full calibration reports should be available if requested. Bore site calibrations shall be performed at the beginning and end of the project and as needed throughout the data collection period. Alternative testing methodologies may be used upon review and acceptance by USDA-NRCS prior to any data acquisition activities.

### 1.3.2 LiDAR Collection Point Spacing and Density

To meet QL2 requirements, the planned resolution of the LiDAR will be a minimum of 0.71 meter Aggregate Nominal Point Spacing (ANPS). The QL2 requirements are as follows:

| Quality Level (QL) | Aggregate nominal pulse spacing (ANPS) (m) | Aggregate nominal pulse density (ANPD) (pls/m2) |
|---|---|---|

| | | |
|---|---|---|
| QL2 | ≤0.71 | ≥2.0 |

To prevent clustering effects and to ensure uniform densities through the dataset, a regular grid, with cell size equal to the design 2*ANPS will be laid over the data. At least 90% of the cells in the grid shall contain at least one LiDAR point. Assessment to be made against single swath, first return data located within the geometrically usable center portion (typically ~95%) of each swath.

### 1.3.3 Acquisition Window and Constraints

LiDAR acquisition shall occur between leaf-off conditions in the Fall of 2016 and the Spring of 2017. Prior consent will be required before the initial project data collection.

The acquisition area shall be free of snow and shall be free of flood conditions with rivers remaining in their channels and near average heights. Extraneous environmental conditions such as rain, fog or smoke shall be avoided.

The LiDAR provider shall ensure that the project area is fully and sufficiently covered with no data voids due to data holidays (i.e. gaps between flightlines) and/or from system malfunctions. Data voids in the bare-earth not caused by classification of geographic features shall not exceed three times the point spacing. Data voids of this size are unacceptable and shall be sufficient reason to reject the entire dataset.

## 1.4 LiDAR Data Format

Point cloud data shall be delivered in ASPRS (American Society of Photogrammetry and Remote Sensing) LAS 1.4 format containing all LAS items of point data record format 6, 7, 8, 9 or 10. The header file should contain all system generated LAS items as defined in the Public Header Block and as a minimum must contain the "File Creation Year Day" and "File Creation Year" which will represent the final deliverable generated LAS date. The projection information for the point data must be specified in the Variable Length Record using the appropriate GeoTIFF tags.

The classification codes will follow the ASPRS Standard LiDAR Point Classes utilizing the following:

- Class 1 – Processed, but unclassified
- Class 2 – Bare-earth ground
- Class 7 – Low noise (low, manually identified, if necessary)

- Class 8 – Model Key points
- Class 9 – Water
- Class 10 – Ignored ground (breakline proximity)
- Class 17 – Bridge decks
- Class 18 – High noise (high, manually identified, if necessary)

Class 1 will be used for feature points that are not in Classes 2, 7, 8, 9, 10, 17 or 18. These typically represent returns from man-made structures, vegetation etc.

Class 7 will be used for artifacts that do not represent the ground, manmade structures or vegetation. Typically these are extraneous points that are below the surface not representing any true feature.

Class 18 will be used for artifacts that do not represent the ground, manmade structures or vegetation. Typically these are extraneous points that are well above the surface not representing any true feature.

No points shall be deleted from the LAS file.

*Note: Classes 7 and 18 are included as a convenience for the data producer. It is not required that all "noise" be assigned to those Classes.*

*Class 8 is included as a convenience for the data producer to identify Model Key Points, but the appropriate attribute bit flag shall be set to comply with USGS Lidar Base Specification v1.2 and LAS v1.4.*

Bare-earth classification shall adhere to the follow specifications using both automated and manual filtering classification routines:

- no more than 2 percent of non-withheld points will have demonstrable errors in the classification value

Special attention must be applied to the classification process due to the geographic nature of the project area which consists of extremely flat terrain mixed with important hydrographic characteristics. Channel geometry of streams and drainage features must be maintained as well as the ability to identify sand bar features within rivers. Dense vegetation data voids must also be minimized by the automatic removal process and "over smoothing" due to aggressive classification must be avoided.

### 1.5 Ground Control

All survey conducted under this project shall be referenced to National Geodetic Survey (NGS) control monuments in the National Spatial Reference System (NSRS) using appropriate horizontal and vertical control. Ideally checkpoint surveys should utilize or tie into the same base station control monuments used for the aerial acquisition to eliminate the possibility of discrepancies between different control stations. Base station locations should be the "best" horizontal (second order or better) and vertical (third order or better) available and have a stability of "C" or better. In the event that no suitable base station monuments exist, new primary ground control will be required and shall conform to the Standards and Specifications for Geodetic Control Networks (1984), Federal Geodetic Control Committee (FGCC). Primary control monuments established with GPS shall meet or exceed NOS NGS-58 "Guidelines for Establishing GPS-Derived Ellipsoid Heights (Standards: 2 cm and 5 cm)" using the appropriate latest geoid model and should be monumented to maintain stability. Ground control stations are expected to have a local network accuracy at the 95% confidence level of 2 cm horizontally and vertically. Sound geodetic principles should be applied when establishing new stations and must include the appropriate supporting documentation such as processing reports, minimally and constrained 3-D least squares adjustment, pictures of the station, etc.

For aerial acquisition a minimum of two base stations capable of collecting dual frequency data at 1 Hz is required. Although not a requirement, it is desired that baseline lengths should not exceed 25 miles. Circumstances may allow for exceeding the 25 mile baseline length if necessary as this length is considered conservative. For quality control, forward and reverse processing of the trajectories should yield similar results and these comparisons should be made available if requested. Additionally other quality statistics from the airborne GPS/IMU processing such as DOP values, resolved ambiguity reports, accelerometer and gyro drift and scale factors etc. should be made available if requested.

Non-vegetated Vertical Accuracy (NVA) and Vegetated Vertical Accuracy (VVA) LiDAR checkpoints will be acquired as outlined in Table C.1 (page A19) of the American Society for Photogrammetry and Remote Sensing (ASPRS), 2014, ASPRS Positional Accuracy Standards for Digital Geospatial Data (EDITION 1, VERSION 1.0. - NOVEMBER, 2014). These LiDAR checkpoints and their coordinates will be used in verifying and validating the accuracy of the LiDAR point cloud.

## 1.6 Accuracy

The absolute vertical accuracy requirement for LiDAR swath data (and DEMs), QL2 is ≤10.0cm RMSEz (Accuracyz ≤19.6cm at the 95% confidence level); however, to best match legacy LiDAR projects / data, the following Lidar accuracies are required:

**Vertical elevations will meet or exceed 10cm RMSEz (Accuracyz = 19.6cm at the 95% confidence level).**

**Horizontal accuracy will meet or exceed 0.6m RMSE (Accuracyr = 1.04m at the 95% confidence level).**

### 1.6.1 Absolute Accuracy Testing

The bare-earth LiDAR DTM will be tested using both NSSDA/FEMA and the ASPRS/NDEP methods. The NSSDA/FEMA method specifies that accuracy should be reported at the 95% confidence level for data tested by an independent source of higher accuracy for horizontal and/or vertical accuracy using a user defined threshold.

Data tested with the NSSDA/FEMA method shall use the following statements:

Tested___(meters) horizontal accuracy at 95% confidence level
Tested___(meters) vertical accuracy at 95% confidence level

Accuracyr = RMSEr X 1.7308 and Accuracyz = RMSEz X 1.9600 at the 95% confidence level.

Both NSSDA/FEMA and ASPRS/NDEP does not require independent testing of horizontal accuracy for elevation products. Therefore if not tested, the following statement will be used:

Compiled to meet___ (meters) horizontal accuracy at 95% confidence level

However it is the intent of the USDA-NRCS to test the horizontal accuracy if possible utilizing the intensity imagery and the full point cloud with intensity values.

### 1.6.2 Relative Accuracy

The vertical accuracy testing uses survey measurements at discrete locations to compute the errors which verify the absolute error. This coupled with relative accuracy (e.g. how one points fits relative to the next, and how one flight line fits relative to the adjacent line) defines the

combined accuracy of the dataset. Data therefore should not have discontinuities between adjacent flight lines or "corn rows" of undulating elevations due to mismatches and sensor anomalies.

| Quality Level (QL) | Smooth surface repeatability (cm) | Swath overlap difference, $RMSD_Z$ (cm) | Swath overlap difference, maximum (cm) |
|---|---|---|---|
| QL2 | ≤6 | ≤8 | ±16 |

Data exceeding these amounts may not cause the whole dataset to fail but may be rejected.

### 1.7 Datums and Projections

The horizontal datum shall be referenced to the North American Datum of 1983 (NAD 83) using the National Adjustment of 2011 (NA2011).

The vertical datum shall be referenced to the North American Vertical datum of 1988 (NAVD88). GEOID12B shall be used to convert ellipsoidal heights to orthometric heights.

The projection is appropriate UTM Zone 13 or 14 North in meters. All units will be to 1 centimeter resolution.

### 1.8 Tile scheme

The tile scheme shall be based on the National Grid which defines spatial addresses by using 3 sets of information; the UTM Zone and the hemisphere identifier value, the regional locator value, and the local address. Tile size will be 1000m x 1000m tiles and referenced to the 5000m x 5000m Nebraska tiles index. Tiles may be clipped by the project boundary.

### 1.9 Hydro-Flattening

Hydro-flattening of the derived DEMs shall be based on the USGS-NGP Lidar Base Specifications, Version 1.2.

### 1.10 Metadata and Reports

Metadata compliant with the Federal Geographic Data Committee's (FGDC) ISO 19115:2003 requirements as outlined in the Nebraska Information Technology Commission (NITC) NITC 3-201 Geospatial Metadata Standards (http://nitc.ne.gov/standards/3-201.html). Metadata should be created on a tile level for each product deliverable.

Metadata shall include as a minimum the following sections;

- Identification Information
- Data quality information which will include all process steps, and the horizontal and vertical accuracy as tested by the LiDAR provider
- Spatial Data Organization Information
- Spatial Reference Information
- Entity and Attribute Information
- Metadata Reference Information

Metadata fields shall also include as a minimum;

- Date of acquisitions
- System type and system collection parameters (flying height, Scan FOV full angle, pulse rate, scanner frequency, side-lap percentage, point density etc.)
- Nominal point density
- Calibration procedures
- Base station control information

Metadata may also be supplemented with projects reports where the report conveys additional information not suitable for metadata. If surveying to establish new ground control stations was performed, a survey report is required.

### 1.11 Media and Data Ownership

All LiDAR data and supplemental products will be delivered on USB external hard drives (2 copies - one for intermediate storage and one for off-site back-up) and will become the property of the USDA-NRCS. All media and data collected under this contract shall be the sole property and can be freely distributed by the USDA-NRCS. No restrictions shall be placed on the data by the LiDAR provider.

## 2 Deliveries and Performance

### 2.1 Deliverables

The following deliverables are detailed in the USGS-NGP Lidar Base Specifications, Version 1.2 starting on page 13.

- **Raw Point Cloud** – fully calibrated LiDAR point cloud delivered by (flight) swath

- **Classified Point Cloud** – LAS files shall be created using the tiling scheme outlined in Section 1.8 and classified as outlined in Section 1.4
- **Hydro-flattening Breaklines** - breaklines delivered in Esri shapefile, or file geodatabase format as PolylineZ and PolygonZ feature classes
- **Digital Elevation Models** – shall be hydro-flattened and created using an appropriate interpolation method to produce 1 meter resolution DEM's (with no null values) for both the tile scheme and by county. DEM's shall be referenced to the same horizontal and vertical datums as the LAS. DEM's will be in IMG format and tiles will be edge joined and seamless within the project. Cells must be aligned and be fully contained within each tile. Additional DEMs shall be produced for both the tile scheme and by county from the first return point cloud data (i.e. Digital Surface Model [DSM])
- **2' Engineering Contours** – shall be created by county and provided in Esri geodatabase format. Contours shall include index contours. The contours shall be machine generated with auto-smoothing and no manual editing.
- **Hillshades** – shall be created from the 1m countywide DEMs.
- **FGDC Metadata** – shall be created for all deliverables including the LAS files by tile, DEMs by tile and by county, 2' Engineering Contours by county.
- **Flight Lines** – Esri Shapefile of flight lines as flown. Flight dates included in the attribute table.
- **A Project Completion Report** which must include the following:

  (a) A LIDAR system data report which must include discussions of: data processing methods used, final LIDAR pulse and scan rates, scan angle, capability for multiple returns from single pulses, accuracy and precision of the LIDAR data acquired.

  (b) A flight report that must document mission date, time, flight altitude, airspeed, and other information deemed pertinent. The report must include information about GPS-derived flight tracks, provide a detailed description of final flight line parameters and GPS controls (i.e. benchmarks), and include ground truth and complementary data. A chart of areas of high PDOP, with curtains (point

obstructions) created for each of the receiver sites is required. A site obstruction diagram shall be provided for each receiver site.

(c) A ground control report that includes, at a minimum, all pertinent base station information and mission notes, including information on GPS station monument names and stability. Digital pictures to also be provided for each control point surveyed.

(d) Data processing procedures of posting, and all orthometric values of x, y, and z coordinates for LIDAR returns.

(e) A system calibration report.

## 2.2 Deliveries

All transportation charges and costs appurtenant thereto, are a subsidiary obligation of the Contractor for which no separate payment will be made. DELIVERIES OR PERFORMANCE shall begin immediately after receiving notice to proceed.

- Delivery shall be sent via FEDEX or UPS and the Contractors expense and made according to the following schedule:
- Final delivery of all products shall be completed and delivered within three months of data collection but no later than April 30, 2018. Incremental delivery and acceptance of blocks of data is required to receive partial payment.
- Work will commence immediately after award and notice to proceed by contracting officer.

Deliver all survey data requested in the survey specifications, check feature data, and any additional survey information developed and or collected for the project.

The Contractor shall return all manuscript copies; horizontal and vertical control information, to the government when the project is completed.

The Contractor shall notify the above consignee at least 48 hours in advance of the date on which to expect delivery of the items. USDA-NRCS personnel at the designated delivery points will provide necessary assistance between the hours of 8:00 a.m. and 4:30 p.m., Monday through

Friday, for accepting delivery of materials. Delivery shall be made at the location designated below in Section 2.4.

### 2.3 Time Extension

In the event these schedules are exceeded due to causes beyond the control and without fault or negligence of the contractor, as determined by the Contracting Officer, this delivery order completion date will be extended one (1) calendar day for each day of delay.

Requests for time extensions for an individual task order should be forwarded to the Contracting Officer no later than fourteen (14) days preceding the completion date shown on the task order.

### 2.4 Shipment

Shipments shall be made to:

**PROJECT MANAGER**
Shandy Bittle
State GIS Specialist
USDA-NRCS
100 Centennial Mall N. Suite 152
Lincoln, NE 68508
402-437-4020
shandy.bittle@ne.usda.gov

A copy of the detailed transmittal letter on all interim deliveries of data, need to be sent to:

**CONTRACTING OFFICERS REPRESENTATIVE (COR)**
Timothy W. Saultz
United States Geological Survey
1400 Independence Road, MS 670
Rolla, MO 65401
573.308.3654
Geospatial Product and Service Contract (GPSC)
Contracting Officer's Representative (COR)

Commercial Partnership Team Lead

Final Delivery:

Shandy Bittle
State GIS Specialist
USDA-NRCS
100 Centennial Mall N. Suite 152
Lincoln, NE 68508
402-437-4020
shandy.bittle@ne.usda.gov

Inspection

Inspection of the data deliverables including accuracy and quality assurance will be performed to ensure conformance to these specifications. If the inspection reveals deficiencies or defects the data or issues will be required to be resolved at no additional cost to the USDA-NRCS. Initial inspections does not relieve the LiDAR provider from the responsibility to correct defective work with no further cost to USDA-NRCS for a period of one year following initial acceptance. If the finished items are found to be in full compliance with the specifications, they will be accepted. The acceptance of any item by an inspector shall not preclude subsequent rejection if such an item is later found to be defective. Inspection of the finished items to determine their conformance to the specifications will be made by a representative of the Contracting Officer upon delivery to the destination. If the inspection reveals any defect or deviation in the manufacture of the items which would make them unfit for the purpose intended, the Contractor will be required to satisfactorily remedy such conditions at no additional cost to the USDA-NRCS.

## 2.5 Other Terms

Every effort will be made to award contract(s) to complete the work as described in this Scope of Work. However, note that the project cost is a preliminary estimate. Depending on the outcome of contract negotiation vs. the estimated cost, if the total funding amount is not sufficient to complete the work as described, then adjustments will be made to either obtain additional funding, or, re-scope the technical details and/or area of interest to the mutual satisfaction of all stakeholders.

If data acquisition cannot be completed during a single season due to unacceptable capture conditions, then it is possible that the remaining AOI would be acquired during the next suitable collection window which may or may not be in the same calendar year.

## 3 Reference Documents

The National Standard for Spatial Data Accuracy (NSSDA) is a Federal Geographic Data Committee (FGDC) standard that federal agencies are supposed to use in determining geospatial accuracy.
http://www.fgdc.gov/standards/projects/FGDC-standards-projects/accuracy/part3/chapter3

The National Digital Elevation Program (NDEP) has created a set of recommended guidelines for digital data that provides information on digital elevation types, product descriptions, metadata profiles, definitions, and map accuracy standards.
http://www.ndep.gov/NDEP_Elevation_Guidelines_Ver1_10May2004.pdf

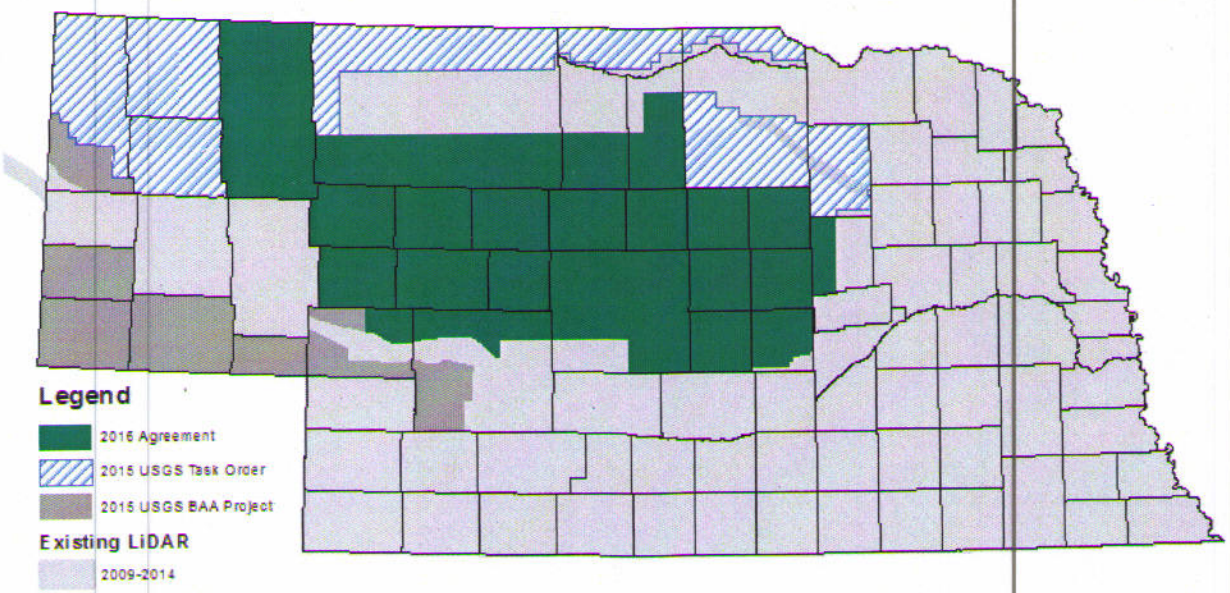
American Society for Photogrammetry and Remote Sensing (ASPRS), 2014, ASPRS Positional Accuracy Standards for Digital Geospatial Data (EDITION 1, VERSION 1.0. - NOVEMBER, 2014)
http://www.asprs.org/a/society/committees/standards/ASPRS_Positional_Accuracy_Standards_Edition1_Version100_November2014.pdf

USGS-NGP Lidar Base Specifications (Techniques and Methods 11–B4, Version 1.2, November 2014)
http://pubs.usgs.gov/tm/11b4/pdf/tm11-B4.pdf

State of Nebraska Elevation Standards. NITC 3-203 Elevation Acquisition using LiDAR Standard
http://nitc.ne.gov/standards/3-203.html

State of Nebraska Metadata Standards. NITC 3-201 Geospatial Metadata Standards http://nitc.ne.gov/standards/3-201.html

## Appendix A


Legend
2016 Agreement
2015 USGS Task Order
2015 USGS BAA Project
Existing LiDAR
2009-2014