

RFP for Hamilton County, Indiana 2019 Planimetric, Topographic and Digital Orthophotography Project

Part 1: RFP Purpose

The purpose of this Request for Proposal (RFP) is to receive proposals for selection of a contractor or contractors to provide professional services for the Hamilton County **2019 Aerial Photography, Remote Sensing, Topography and Basemap Project**.

This RFP does not constitute a contract for services performed or to be performed. This project will include the following key components:

- Digital Aerial Photography (nadir)
- Preliminary (unrectified) images (nadir)
- Ground Control
- Aerial Triangulation
- Development of Option 1: 6-inch, or Option 2: 3-inch pixel Digital Orthophotography
- USGS 3DEP Quality Level 2 Lidar products
- Topographic Products – 1-foot Contours and Spot Elevations derived from new Lidar with Breaklines and DTM used to produce the contours
- Planimetric Mapping – Meet or exceed The National Map Accuracy Standard for 1:1200 (1"=100') Map Scales

All proposals submitted become the property of Hamilton County and will not be returned. The County is not responsible for any costs incurred by the respondent in proposal preparation, presentations, site visits, or benchmarks performed.

Part 2: Project Overview

Hamilton County, Indiana is the fastest growing county in Indiana and one of the fastest growing counties in the Midwest. The county frequently updates its GIS base map to keep up with growth and the associated public services it provides.

The purpose of this RFP is to receive proposals to acquire new digital aerial photography; produce new color digital orthophotography products; acquire new QL2 3DEP Lidar; produce new topographic products; and update and capture new planimetric mapping features in the year 2019.

Project Area

Hamilton County is approximately 20 miles by 20 miles. The project area includes all of Hamilton County plus approximately 1,500' to 2,500' beyond the county boundary for a total area of 20.83 miles by 20.83 miles, or 434.03 square miles. The Orthophotography and Lidar mapping must include full delivery tiles/files for the complete delivery area.

Current Data

The Hamilton County GIS data may be viewed from our web site:
<https://gis1.hamiltoncounty.in.gov/generalviewer/>

Part 3: Proposal Instructions

- **Registration** To receive addenda, answers to information requests and other important communications regarding this RFP, **it is imperative you register your receipt of this RFP** by sending the following information to Joan Keene at joan.keene@hamiltoncounty.in.gov:
 - Name of Firm
 - Address
 - Contact Name
 - Phone
 - Fax
 - Email
- **Submission Instructions** Submit one original (clearly marked **original**) and two copies of the proposal in a sealed package to this address:

**Hamilton County Auditor
33 North 9th Street, Suite L21
Noblesville, IN 46060**

Faxed proposals will **not** be considered.

The original proposal must be signed by a person who is authorized to sign contracts for the respondent. The copies of the proposal should show copies of the signature.

The original proposal (and only the original proposal) must also include a digital copy of the proposal in Adobe PDF format on CD, DVD, or Flash Drive.

Label the outside of the sealed package as follows:

**Proposal for 2019 Remote Sensing,
Planimetric and Topographic Project**

- **Deadline** Proposals must be received at the location stated above no later than the Proposal Due Date shown in the Project Schedule. Proposals received after the deadline will not be accepted.
- **Presentations and Site Visits** Any or all respondents may be invited to make a presentation. If so, the County will notify the respondents of the date and time of the presentation. In addition, certain respondents may be asked to host a visit by County representatives to investigate the respondent's ability to meet the project requirements.

All costs incurred by the respondent in the presentations or site visits will be the responsibility of the respondent. After any such presentation, visit or demonstration, proposals may be evaluated again.

- **Project Schedule** The County has established a tentative schedule for proposal submission, review, contractor selection and project initiation, as follows:

Project Schedule		
Milestone	Date	Time
RFP Released	Friday , DEC 21, 2018	
Information Requests Deadline	Wednesday , JAN 9, 2019	12:00 Noon
Response to Information Requests Deadline	Friday , JAN 11, 2019	12:00 Noon
Proposal Due Date	Monday , JAN 28, 2019	12:00 Noon
Oral Presentations (if required)	Tuesday , FEB 5, 2019	
Begin Contract Negotiations	Friday , FEB 8, 2019	
Contractor Selection/Commissioners Approval	Monday , FEB 11, 2019	
Notice to Proceed	Wednesday , FEB 13, 2019	
Orthophoto Delivery	No Later Than Monday , JUL 29, 2019	
Project Completion	No Later Than Monday , DEC 30, 2019	

- **Proposal Acceptance and Rejection** The County reserves the right to accept any proposal, to reject any or all proposals, to waive irregularities or informalities in any proposal and to make the award in any manner deemed in the best interest of the County. This includes dividing portions of the work between two or more companies.
- **Questions** If you have any questions about this RFP or the proposal procedures, submit them by email by the Information Request Deadline indicated in the Project Schedule. Requests received after this deadline will not be considered. All requests received before the deadline will be answered by the County in an email to all registered recipients of this RFP. The requestor is responsible for notifying the County of any problem in receiving replies.

Email questions about this RFP or the proposal procedures to:

Joan Keene
Hamilton County GIS Director
One Hamilton County Square, Suite 206
Noblesville, IN 46060-2234
Email: joan.keene@hamiltoncounty.in.gov

- **Single Point of Contact** Responders should contact Joan Keene and no one else, regarding the status of proposal evaluation. Disregarding this directive may disqualify the responder from further consideration.

Part 4: Selection Criteria

The following criteria will be used to evaluate proposals. This is not intended to be a comprehensive list, nor is the arrangement of the criteria meant to imply order of importance in the selection process.

- **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.

- **Technical Approach** The proposals will be evaluated on the technical approach to the project. The County will consider the following items in its evaluation:
 - Altitude, sensor, and method of photo acquisition
 - Number of flight lines and overlap and sidelap percentages
 - Number and location of ground control points
 - Mosaicking process including location of seamlines
 - Proposed methodology to develop a new DEM from new Lidar to support both the earlier and final delivery of orthophotos and for the later delivery of QL2 3DEP Lidar base products.
 - Procedures and methods for planimetric mapping change detection and updates, and the development of new breaklines to support both the new 3DEP hydroflattened DEM product and the new DTM to support development of new topographic contour and spot elevation data.
 - Additional details on the Lidar acquisition related to the processing and adherence to USGS 3DEP specifications to meet the accuracy and quality standards for all QL2 products.
 - Other relevant components
- **Sensors** The County requires the respondent to use digital sensors for all parts of this project (nadir photography and Lidar).
- **Equipment Ownership** The County prefers the respondents to 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.
- **Quality Control** The proposal will be evaluated based on the apparent effectiveness of the respondent's proposed quality control program. Attention will be paid to the process for finding and correcting obvious errors prior to final delivery.
- **Professional Registration** The proposals will be evaluated for professional registration. The respondent must include an ASPRS-recognized Certified Photogrammetrist and a Professional Land Surveyor licensed to practice in Indiana. ***The supervisory staff for this project must be located in the office where the majority of the work will be done.***
- **Business Registration** The respondent must be licensed to do business in the State of Indiana.
- **Proximity to the Project Area** While not a mandatory condition, it is recognized that there are advantages for the County 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 Hamilton County. 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 this contract. A subcontractor shall not subcontract any portion of its work under this contract. ***Hamilton County prefers not more than 20% of the work be subcontracted.*** No proposals will, however, be disqualified solely on the basis of this factor.

- **Off-Shore Labor** It is the County’s intent to have all work performed within the United States.
- **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.
- **Local Project Experience** The County prefers to select a contractor that can demonstrate successful project experience in the State of Indiana or at a minimum within the Midwest region.
- **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 Hamilton County. Specific attention will be paid to Ortho & Lidar acquisition experience and planimetric and topographic mapping experience.
- **Schedule and Availability** The respondent’s projected schedule and resource availability will be evaluated in the choice of a contractor, although the County understands that the actual beginning and completion dates are subject to the notice to proceed.
- **Sample Data Products** The sample digital orthophotos, Lidar data products, and Topographic mapping products will be an important factor in evaluating the contractor’s ability to meet the requirements of the specification.
- **Fee** The respondent’s fee will be considered in the choice of contractor.

Part 5: Proposal Format

All proposals must follow the same format. No exceptions to this format will be accepted. To be accepted for evaluation, the proposal format must address all required components in order.

The aim of the required format is to simplify the proposal preparation and evaluation processes and to ensure that all proposals receive the same orderly review.

All proposals must include the following components:

Section	Topic
	Cover Letter
1	Company Overview
2	Project Services
3	Project Team
4	Related Experience
5	Proposed Schedule
6	Fee
7	Sample Data Products
8	Additional Information

Part 6: Proposal Components

- **Cover Letter** Provide a one- or two-page cover letter. Include the original signed cover letter with the original proposal and a copy of the cover letter with each copy of the proposal.

The cover letter should provide the following:

- A brief statement of the respondent's understanding of the project
 - The name, title, phone number, fax number, email address and street address of the person in the proposer's organization who will respond to questions about the proposal
 - Highlights of the respondent's qualifications and ability to perform the project services
- **Section 1: Company Overview** Provide the following information about your firm:
 - The firm's name, business address, phone number, and fax number
 - The year the firm was established
 - Former names of the firm, if applicable
 - The type of ownership and parent company, if applicable
 - The location of the office or offices that would provide the project services
 - A brief statement of the firm's background, demonstrating longevity and financial stability
 - **Section 2: Project Services** In this section, which is intended to be the heart of the proposal, describe the methods, sensor(s), hardware, and software you intend to use to perform the project services described in Part 7 of this RFP, and your expertise with them. Include information about your quality control program. This section should be subdivided into the following subsections:
 - A. Digital Orthophotography
 - B. Lidar
 - C. Topography
 - D. Planimetric Update
 - **Section 3: Project Team** Start the section by introducing the designated project manager and the project team. Remember that the selection criteria in Part 4 require the proposed team to include an ASPRS-recognized Certified Photogrammetrist and a registered Professional Land Surveyor licensed in the State of Indiana. Include a project team organization chart.

For each key person you would assign to the project, include a one- or two-page résumé that includes a summary of professional qualifications, relevant project experience, education, and professional registration. The maximum number of résumés is 10.

- **Section 4: Related Experience** For up to five 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, the name of the person who can be contacted for reference, and the contact information for that person.
- **Section 5: Proposed Schedule** Include a brief schedule for the completion of the project services and the deliverables identified in Section 2 of your proposal. Include the proposed start and end dates. Describe your projected resource availability for the anticipated duration of the project.
- **Section 6: Fee** Complete the Fee Proposal Form from Attachment A. (Page 15)
- **Section 7: Sample Data Products** Provide two different samples or each deliverable on a CD, DVD, or Flash Drive. The samples should have been created by your company with the same type of sensor(s) and processes you are proposing for this project. The samples must meet the following requirements:
 - Sample Digital Orthophotos
 - 24-bit natural color plus NIR Band samples of both 6-inch and 3-inch pixel
 - TIFF, ECW, or MrSID format (no compressed samples)
 - 100 MB maximum size per sample image
 - Projection and georeferencing defined either in the file header (e.g. geoTiff) or in auxiliary files (e.g. aux, aux.xml, world file) such that the image can be opened in the latest version of ArcGIS for Desktop and the pixel size measured.
 - Sample Lidar Data conforming to USGS 3DEP specifications
 - Las Point Cloud
 - Corresponding Hydro-flattened DEM with Breaklines
 - Corresponding Lidar Intensity Image
 - Sample Topographic Mapping Products
 - 1-Foot Contours and Spot Elevations
 - Corresponding DTM with Breaklines

We will assume the samples are representative of the photos you will provide to the County in this project, however, ***the County's acceptance of the samples does not relieve the contractor from meeting any part of this specification.***

- **Section 8: Additional Information** At your discretion, include additional information such as an equipment list and other information that supports your proposal. However, choose the additional information carefully, because this section of the proposal should not constitute the bulk of your submission.

Part 7: Specifications

Existing Conditions

The County completed a color digital orthophotography (R,G,B and NIR), planimetric update, and topographic mapping project in 2016. Planimetric and topographic features were updated in 2016 using photogrammetry. The buildings were originally captured in 1996 and were previously updated

in 1998, 2001, 2004, 2007 and 2011. The hydro was captured in 2004 and was previously updated in 2007. The edge of pavement was originally captured in 1996 and was previously updated in 1998, 2004, 2007 and 2011. The topography (1-foot contours and spot elevations) was originally captured in 2004 (using Lidar) and previously updated in 2011 (using photogrammetry). The County has also obtained new 6-inch pixel color (R,G,B and R,G,NIR) digital orthos from spring photography in 2012, 2013, 2014, 2015 and 2016 and new 3-inch pixel color (R,G,B and R,G,NIR) digital orthos from spring photography in 2017 and 2018. The following data will be made available to the selected contractor:

- Ground Control – The County has established over 200 horizontal and vertical ground control monuments located on corner sections and quarter corner sections, evenly dispersed throughout the interior and perimeter of the County.
- 2-D Hydrology Features – Rivers, Lakes, Streams and Ponds
- Edge of pavement
- Centerline data (maintained continually from orthophotography, plats, and engineering plans)
- Building Structures (last updated from 2016 photography)
- Tile Grid – A grid of the 2,500' x 2,500' tiles used by Hamilton County to be used for all ortho product deliveries, and a grid of the 5,000' x 5,000' tiles used by the State of Indiana for all Lidar product deliveries
- Oblique Aerial Photos – The 2018 oblique photos are available for viewing on our web site.

The successful contractor, acting under the authority and approval of the County, will provide the following professional services for the 2019 Project. **The vendor must describe the production methods and quality control processes that will be used to meet the following specifications:**

Aerial Imagery

- **Aerial Image Acquisition** The contractor **must** acquire color imagery during Spring 2019. The imagery will be used to produce digital orthophotography, breaklines and planimetric mapping. The specific sensor to be used for Aerial Image Acquisition compilation must be specified in the proposal. The sensor used for the project must be the same as that identified in the proposal.
- **Flying Height** The flying height must be at an appropriate altitude to produce the following:
 1. Digital orthophotography to meet or exceed Horizontal Accuracy for 30.0 cm (ASPRS Positional Accuracy Standards Edition 1, Version 1.0, - Nov. 2014) at 0.5-foot pixel resolution for the entire area; or
 2. Digital orthophotography to meet or exceed Horizontal Accuracy for 15.0 cm (ASPRS Positional Accuracy Standards Edition 1, Version 1.0, - Nov. 2014) at 0.25-foot pixel resolution for the entire area. The contractor may resample from a smaller pixel resolution to achieve the 0.5-foot or 0.25-foot pixel resolution, but in no case shall the contractor resample from a larger pixel resolution to achieve a smaller pixel resolution.

b. 1" = 100' scale Planimetric Mapping to meet stated standard.

- **Flight Plan** After the scope of services has been determined, a final flight plan will be designed by the selected contractor and approved by the County.
- **Environmental Conditions** Aerial imagery should be obtained when the sky is sufficiently clear; the ground is sufficiently free from snow, haze, smoke, dust, and cloud shadows; rivers and streams are within their normal banks, and deciduous trees are sufficiently barren to permit the intended uses of the imagery. Spectral reflectance from water should be minimized and should not obscure shoreline features. In no case will the maximum cloud cover exceed 5 percent per image. The solar angle must be 30-degrees or more above the horizon at the time of exposure.
- **Aircraft and Crew Members** Aircraft must be maintained and operated in accordance with the regulations of the Federal Aviation Administration and the Civil Aeronautics Board.

Individual crewmembers must have five years or more experience in flying precise photographic missions for aerial surveys.

- **Reflights** The contractor 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 must use the same sensor.
- **Crab** Crab must not exceed five-degrees between any two consecutive flights, nor more than three degrees on any one flight line. At the earliest opportunity, new imagery must be acquired to replace rejected photographs or flight lines.
- **Sidelap** Sidelap must average 30 percent, \pm 5 percent. Any adjacent flights with sidelap of less than 30 percent or more than 35 percent will be rejected, and the affected flights must be re-flown at the earliest opportunity.
- **Description of Methodology** Proposals must include description of the production process and the quality control measures to be included.
- **Preliminary (unrectified) Images** The County requires a set of preliminary images to be delivered within two weeks of acquisition of the aerial imagery. The purpose of these images is for applications which do not require rectified images, such as code enforcement.

These images should be in uncompressed, untiled TIFF format unless another format is agreed by both parties. Each image should be referenced to an index map showing the footprint of the preliminary images. There is no requirement for rectification or overlap of these images, but they must be oriented with north at the top of each image and each image must include a world file.

- **Ground Control** The County has established over 200 horizontal and vertical ground control points (see Attachment B).

- **Targeting** The selected contractor must schedule targeting for all horizontal and vertical photo control points with the County based on the scheduled aerial photography. Targeting must occur **before** the aerial photography is acquired and be maintained until the photography is completed and accepted.

All target panels must be of appropriate size for the scale of photography and sufficiently light-reflective to create a high contrast with the background. Targets must be secured with the center of the target over the station. Proposals should specify the target material, size, and shape to be used.

- **Horizontal and Vertical Control** The horizontal datum used for this project will be the latest NGS resolution of the North American Datum 1983 (NAD83), Indiana State Plane Coordinate System, East Zone, and expressed in U.S. Survey Feet. The vertical datum used for this survey will be North American Vertical Datum 1988 (NAVD88).

Photogrammetric Equipment Requirements

It is in the County's interest that the contractor uses the most cost-effective technology while maintaining the required accuracy. The specific photogrammetric equipment to be used for Aerial Triangulation, Stereo Compilation and Digital Orthophotography production compilation must be specified in the proposal. The instruments used for production must be the same instruments identified in the proposal.

Aerial Triangulation (AT)

The contractor must use aerial triangulation (AT) techniques to extend and densify ground control for the production of digital orthophotography for 1"=100' scale mapping.

- **Mensuration** Mensuration must be done on equipment that is capable of one micron of intrinsic accuracy.
- **Software** The aerial triangulation solution should be calculated using industry-standard software packages. The solution must be achieved from a full bundle adjustment.
- **Horizontal and Vertical Control** All horizontal ground control positions computed by analytic triangulation must be in the Indiana State Plane Coordinate System (East Zone) referenced to NAD83. Vertical control must be referenced to NAVD88.
- **Description of Methodology** Proposals must include a description of the production process and the quality control measures to be included.
- **Quality Control** Throughout triangulation, numerous checks must be made to detect data and field control errors.

Photogrammetric Compilation

Planimetric and topographic vector and point data shall be delivered in ESRI (shapefile or geodatabase) format. The data will have minimal attributes, similar to the data available for download from the Hamilton County web site. The data shall not be broken into areas smaller than the project area unless required for partial deliveries. If partial deliveries are made the data shall not have disjoints, overlaps, or underlaps between delivery areas.

Lidar Acquisition

The contractor **shall** acquire Lidar during the late winter/early spring 2019. It is required that the LIDAR data and all derivative products meet or exceed the USGS 3DEP QL2 Lidar data specifications and include all agreed upon USGS 3DEP BAA base deliverable products, reports, metadata, and quality control checks to insure its acceptance into the USGS 3DEP program. Detailed 3DEP Lidar specifications can be found in the FY19 USGS BAA Announcement (<https://www.usgs.gov/core-science-systems/ngp/3dep/fy19baa>) and the V1.3 USGS Lidar Base Specifications, February 2018 document. All Lidar product deliverables shall be in 3DEP specified formats delivered in Indiana's 5,000x5,000 foot grid tiles; in the Indiana State Plane East zone, and NAVD88 Vertical Datum. The resulting dataset shall meet the current USGS Lidar Base Specification (<http://pubs.usgs.gov/tm/11b4/pdf/tm11-B4.pdf>).

Planimetric Update

The following Planimetric data will be updated:

- Hydro Features: rivers, lakes, streams, ponds, swamps, dams, spillways, headwalls, culverts, large culvert pipes
- Buildings: Structures greater than 10' x 10', or 100 sq. feet
- Transportation: edge of pavement

The identified planimetric features will be updated from the aerial photography. The vector data will be snapped, joined, and concatenated to create continuous segments without over runs and gaps to allow the compiled planimetric data to be implemented into the county's GIS. Building outlines will be closed polygons.

Centerline data provided by the County is maintained continually from orthophotography, subdivision plats, and engineering plans. **Updating centerlines is not a part of this project.** The centerline data is being provided to assist identifying areas of new development and new pavement features.

The hydrographic layer (rivers, lakes, streams, creeks, reservoirs, ponds and swamps) will be digitized in the direction of flow. When digitizing water features that are through or under roads, bridges, culverts or other structures, a hidden water line will be used to create a continuous segment. Water bodies such as lakes and ponds will be closed polygons. Where a stream or river enters and exits the water body, a hidden water line will be placed through the center of the polygon and joined to the adjacent stream or river. This hidden line will be in a separate layer, so it can be displayed as needed.

Rivers, streams, and creeks greater than 8 feet wide will be shown with both edges and an interpreted centerline.

New Topographic Features

New topographic data consisting of Breaklines, Digital Terrain Model (DTM), 1-foot Contours, and Spot Elevations will be developed:

- **Breaklines:** Should be placed along breaks in the terrain, transportation features, walls, drainage, and wherever necessary to meet the stated accuracy requirements. Breaklines shall be delivered in ESRI shapefile or geodatabase format.
- **DTM:** Using the Lidar data and new breaklines, the contractor will generate a new DTM to support the development of contour and spot elevation features.
- **Contours and Spot Elevations:** Develop 1-Foot contours and spot and water elevations for project area. The contours will be of cartographic quality devoid of superfluous tops, depressions, and anomalies. Spot elevations shall be placed at road intersections, tops of hills, bottoms of depressions, at saddles and in large flat areas where required to supplement contour information.

Digital Orthophotography

- **Version 1.** One set of 24-bit natural color digital orthophotography with a 0.5-foot pixel resolution, to include 256 levels of value for each color band (red, green, and blue) in uncompressed, untiled TIFF format with world files.
- Tile format shall follow a modular layout, with each image covering 2,500' x 2,500'. Full tiles are required. The southwest corner of the southwest-most tile is at a northing of 1,702,500.00 and an easting of 165,000.00 in NAD83 Indiana State Plane Coordinates, East Zone, U.S. Survey feet (see Attachment C).
- Visible seams or sutures within a tile or between tiles, which exhibit a noticeable "edge" or "displacement" effect, will be grounds for rejection of that tile.
- The tile naming convention will be supplied by the County (see Attachment C).

- **Version 2.** One set of 24-bit natural color digital orthophotography with a 0.25-foot pixel resolution, to include 256 levels of value for each color band (red, green, and blue) in uncompressed, untiled TIFF format with world files.
- Tile format shall follow a modular layout, with each image covering 2,500' x 2,500'. Full tiles are required. The southwest corner of the southwest-most tile is at a northing of 1,702,500.00 and an easting of 165,000.00 in NAD83 Indiana State Plane Coordinates, East Zone, U.S. Survey feet (see Attachment C).
- Visible seams or sutures within a tile or between tiles, which exhibit a noticeable "edge" or "displacement" effect, will be grounds for rejection of that tile.
- The tile naming convention will be supplied by the County (see Attachment C).

Metadata

The contractor shall provide metadata compiled to the current standard endorsed by the Federal Geographic Data Committee (FGDC) for each of the data deliverables. Currently, this is the Content Standard for Digital Geospatial Metadata Version 2 (FGDC-STD-001-1998).

The contractor shall provide one (1) Project-Level metadata document for each of the deliverable Projects within this agreement (e.g. Orthoimagery, Topography, Planimetric Updates, 3DEP Lidar), plus one (1) detailed metadata document for each Deliverable Product within the 3DEP Lidar Project (e.g. LAS Swath files, Classified LAS, LAS Intensity, Breaklines, DEM, Tile Grid, Control Points, Check Points, etc...)

Part 8: Summary of Deliverables

The successful Contractor will be responsible for producing and delivering the following (digital project documents may be in either Microsoft Word or Adobe PDF format):

Project Documents:

- Project Plan – one digital copy
- Flight Map/Control Diagram – one digital copy
- Aerial Photography Report – one digital copy
- Aerial Triangulation Report – one digital copy
- Lidar Report – one digital copy
- Project documents may be delivered by email or posted on an FTP site for download. **NOTE: If zip files are emailed, the extension must be changed.**

Project Data:

- Preliminary (unrectified) images with world files.
- **Version 1**- County wide color digital orthophoto tiles with 0.5-foot pixel resolution delivered in TIFF format (no geoTIFF headers, no tiling, no compression) with a TIFF world file for each tile
- **Version 2**- County wide color digital orthophoto tiles with 0.25-foot pixel resolution delivered in TIFF format (no geoTIFF headers, no tiling, no compression) with a TIFF world file for each tile
- A continuous DTM surface used for orthorectification in ESRI readable format .img.
- A continuous DTM surface used for topographic contour and spot elevation development in ESRI readable format .img.
- Topographic Breaklines and Ortho Mosaic Seam Lines in ESRI format (SHP or FGDB).
- A continuous Hydrographic dataset in ESRI format (SHP or FGDB).
- A continuous Transportation dataset in ESRI format (SHP or FGDB).
- A continuous Building dataset in ESRI format (SHP or FGDB).
- 3DEP Lidar Products - All deliverables shall follow the USGS Lidar Base Specifications for QL2 data
- FGDC Metadata – 1 Metadata document for each deliverable product, plus detailed metadata documents for the 3DEP Lidar Project (XML format)
- Final digital data (orthophotography, Lidar, DEM, DTM, planimetric data, and topographic data) will be delivered on USB external disk drive or flash drive(s).
- Interim project data and preliminary (unrectified) images may be delivered on USB external hard drive or flash drive(s) or ftp download.

All mapping and other products produced for this project shall be consistent across the County's entire project area and meet or exceed the required ASPRS Positional Accuracy Standards for Digital Geospatial Data as stated within this document.

All products and services produced for this project become the sole property of Hamilton County and cannot be used or reproduced without written permission. Hamilton County has the right to grant or deny any request

Part 9: Independent Quality Control / Quality Assurance of all Deliverables

The County will perform independent quality control/quality assurance checks of all pilot, initial, and final delivered products and reports delivered by the Contractor. The County may also hire an independent (3rd-Party) Contractor to assist the County in this Independent Quality Control / Quality Assurance process.

To support this effort, the Contractor shall post all new Orthoimagery, Lidar (DEM), Planimetric, and Topographic mapping products to a web-based application for use by the County's QA/QC Team to perform this independent QA/QC review and acceptance. The County will use this system for a visual review and acceptance of the work performed before delivery of the data to the County on hard drives. The Contractor's system shall provide for a means for the County to create quality control call-outs on their QA/QC application.

After the Contractor makes the call-out corrections to each deliverable product, the Contractor will then make the digital file delivery to the County on hard drives. The County QA/QC Team will then perform final digital checks of each product to verify the call-out corrections were made, and that all digital files are in the correct format, are usable and not corrupt, and conform to all of the delivery specifications documented herein.

Attachment A: Fee Proposal Form

Project Title: 2019 Planimetric, Topographic, and Digital Orthophotography Project

Company Name: _____

Work Phase	Fee
Ground Control	\$
Aerial Photography	\$
Preliminary (unrectified) images	\$
Aerial Triangulation	\$
Lidar	\$
DTM/Contour Update	\$
Version 1 - .5' Digital Orthophotography	\$
Version 2- .25 Digital Orthophotography	\$
Hydro Update	\$
Buildings Update	\$
Edge of Pavement Update	\$
	\$
Total Fee	\$

Authorized Signature: _____

DATE: _____

Attachment B: Control Points

Existing control points are available for download and/or viewing from the Hamilton County web site. The layer is called "Section Corners (GPS)". For each control point, there is a link to its tie sheet.

<ftp://ftp.hamiltoncounty.in.gov/GIS/Data>

Attachment C: Tile Grid

Attachment C consists of a zip file containing several ESRI shapefiles including the Hamilton County tile grid, the county boundary, and political township boundaries.