

REQUEST FOR LEGISLATIVE ACTION

Completed by County Counselor's Office:

Res/~~Ord~~ No.: 19330

Sponsor(s): Dennis Waits

Date: December 5, 2016

SUBJECT	<p>Action Requested</p> <p><input checked="" type="checkbox"/> Resolution</p> <p><input type="checkbox"/> Ordinance</p> <p>Project/Title: <u>Awarding a contract for the furnishing of oblique photography services for use by the Jackson County Assessment and GIS departments at total cost to the County not to exceed \$182,240.</u></p>																								
<p>BUDGET INFORMATION</p> <p><i>To be completed By Requesting Department and Finance</i></p>	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:60%;">Amount authorized by this legislation this fiscal year:</td> <td style="text-align: right;">\$182,240</td> </tr> <tr> <td>Amount previously authorized this fiscal year:</td> <td style="text-align: right;">\$00</td> </tr> <tr> <td>Total amount authorized after this legislative action:</td> <td style="text-align: right;">\$182,240</td> </tr> <tr> <td>Amount budgeted for this item * (including transfers):</td> <td style="text-align: right;">\$211,498</td> </tr> <tr> <td colspan="2">Source of funding (name of fund) and account code number;</td> </tr> <tr> <td>FROM Assessment Fund, Non-Departmental Assessment, Software Purchases 045-4500-56661</td> <td>TO Assessment Fund, Non-Departmental Assessment, Other Contractual Services 045-4500-56790</td> </tr> </table> <p>* If account includes additional funds for other expenses, total budgeted in the account is: \$</p> <p>OTHER FINANCIAL INFORMATION:</p> <p><input type="checkbox"/> No budget impact (no fiscal note required)</p> <p><input type="checkbox"/> Term and Supply Contract (funds approved in the annual budget); estimated value and use of contract: Department: _____ Estimated Use: \$ _____</p> <p>Prior Year Budget (if applicable): _____</p> <p>Prior Year Actual Amount Spent (if applicable): _____</p>	Amount authorized by this legislation this fiscal year:	\$182,240	Amount previously authorized this fiscal year:	\$00	Total amount authorized after this legislative action:	\$182,240	Amount budgeted for this item * (including transfers):	\$211,498	Source of funding (name of fund) and account code number;		FROM Assessment Fund, Non-Departmental Assessment, Software Purchases 045-4500-56661	TO Assessment Fund, Non-Departmental Assessment, Other Contractual Services 045-4500-56790												
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PRIOR LEGISLATION	<p>Prior ordinances and (date): _____</p> <p>Prior resolutions and (date): _____</p>																								
CONTACT INFORMATION	<p>RLA drafted by (name, title, & phone): Lisa Honn, Senior Administrative Manager, 816-881-3333</p>																								
REQUEST SUMMARY	<p>On 10/17/16, Jackson County Department Finance and Purchasing issued RFP No. 72-16 for oblique photography services on behalf of the Assessment and GIS Departments. On 11/7/16, 3 responses were received and reviewed in accordance with Jackson County Code, Chapter 10, Section 1050, Formal Competitive Bid Procedure. Proposals were reviewed based on firm experience (30%), past performance (20%) and pricing (50%). The 3 responses were scored as follows:</p> <table border="1" style="width:100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Vendor</th> <th>HQ location</th> <th>Experience (30%)</th> <th>Performance (20%)</th> <th>Pricing (50%)</th> <th>Total Score</th> </tr> </thead> <tbody> <tr> <td>Fugro</td> <td>Rapid City, SD</td> <td>7.6</td> <td>8.8</td> <td>7.25</td> <td>7.7</td> </tr> <tr> <td>Sanborn</td> <td>Colorado Springs, CO</td> <td>8</td> <td>9</td> <td>9.75</td> <td>9.1</td> </tr> <tr> <td>Pictometry</td> <td>Rochester, NY</td> <td>9.2</td> <td>9.2</td> <td>6.5</td> <td>7.9</td> </tr> </tbody> </table> <p>Based on a thorough review of all respondents and committee scores, the review committee selected Sanborn as the winning vendor for this RFP.</p>	Vendor	HQ location	Experience (30%)	Performance (20%)	Pricing (50%)	Total Score	Fugro	Rapid City, SD	7.6	8.8	7.25	7.7	Sanborn	Colorado Springs, CO	8	9	9.75	9.1	Pictometry	Rochester, NY	9.2	9.2	6.5	7.9
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	<p>Aerial photography has a long history of being employed for assessment purposes due to some of its main advantages, including large area imaging from above and minimization of field work. Oblique photographs, multi-camera aerial systems, capture not only the conventional nadir views, but also tilted images at the same time. Therefore, oblique imagery allows for the inspection of a building from four cardinal directions by using monoplotted functionalities. The developed application for viewing oblique images allows to measure building height and distances and to digitize man-made structures, creating 3D surfaces and building models. The resulting image allows for the identification of a building from several oblique points of views, as well as the calculation of the approximate height of buildings, ground distances and basic vectorization. For the Assessment Department, this will reduce the amount of time necessary for staff to be in the field and provide them the tools necessary for providing accurate descriptions and measurements. For GIS, this will move them in the direction of providing 3D representation of structures that will be potentially beneficial to Public Works, Emergency Management and Law Enforcement.</p>	
CLEARANCE	<input type="checkbox"/> Tax Clearance Completed (Purchasing & Department) <input type="checkbox"/> Business License Verified (Purchasing & Department) <input type="checkbox"/> Chapter 6 Compliance - Affirmative Action/Prevailing Wage (County Auditor's Office)	
ATTACHMENTS	<ol style="list-style-type: none"> 1. Memo – RFP Review Committee selection 2. RFP Review committee combined scores 3. Sanborn pricing sheet 4. Sanborn RFP proposal pages 53-74, 83-90 	
REVIEW	Department Director: <i>Robert D. Murphy</i>	Date: <i>Nov. 29, 2016</i>
	Finance (Budget Approval): <i>If applicable</i> <i>[Signature]</i>	Date: <i>11/25/16</i>
	Division Manager: <i>Marylou Brown</i>	Date: <i>12/1/16</i>
	County Counselor's Office:	Date:

Fiscal Information (to be verified by Budget Office in Finance Department)

- This expenditure was included in the annual budget.
- Funds for this were encumbered from the _____ Fund in ____.
- There is a balance otherwise unencumbered to the credit of the appropriation to which the expenditure is chargeable and there is a cash balance otherwise unencumbered in the treasury to the credit of the fund from which payment is to be made each sufficient to provide for the obligation herein authorized.
- Funds sufficient for this expenditure will be/were appropriated by Ordinance # _____
- Funds sufficient for this appropriation are available from the source indicated below.

Account Number:	Account Title:	Amount Not to Exceed:

- This award is made on a need basis and does not obligate Jackson County to pay any specific amount. The availability of funds for specific purchases will, of necessity, be determined as each using agency places its order.
- This legislative action does not impact the County financially and does not require Finance/Budget approval.

Memo

To: Kyle Brack, Senior Buyer

From: Lisa Honn, Senior Administrative Manager



Date: November 23, 2016

Re: RFP No. 72-16 Evaluation

RFP No. 72-16, for oblique photography services, was electronically posted to our online bidding opportunities on Oct. 17, 2016 by the Jackson County Purchasing Division. It remained posted until Nov. 4, 2016. A total of 3 responses were received by the Purchasing Division and reviewed by committee.

The committee consisted of myself, 1 GIS staff, 2 IT staff and 2 Assessment staff. The three proposals were from Fugro Geospatial, Sanborn and Pictometry International. They were reviewed and scored on the following criteria:

1. Firm experience - 30%
2. Past performance – 20%
3. Pricing – 50%

On a scale of 1 through 10, 10 being the best, Fugro received 7.7, Sanborn received 9.1 and Pictometry received 7.9. Based on the careful evaluation and scoring of each proposal, this committee recommends Sanborn as the best response to meet the County's needs. The process followed is consistent with Jackson County Code, Chapter 10, Section 1050, Formal Competitive Bid Procedure.



REQUEST FOR PROPOSAL 72-16 Evaluation Matrix
RFP NAME: Oblique Photography Services
DEPARTMENT NAME: GIS & Assessment

No	Respondent	Firm Experience	Past Performance <small>(references considered)</small>	Ability-to-Perform <small>(IC Code, Ch 10, Para 1054.7 considered)</small>	Additional Services	Pricing	Total Score
		30%	20%	0%	0%	50%	
1	Pictometry International	9.2	9.2			6.5	7.9
2	Fugro Geospatial	7.6	8.8			7.25	7.7
3	Sanborn	8	9			9.75	9.1
4							0.0
5							0.0

COMMENTS: TOTAL SCORES

How to utilize Matrix:

1. Assign score 1-10 (1 is lowest, 10 is highest) for each criterion for each vendor.
2. Raw scores are automatically computed into a weighted Total Score.

Sanborn

IX. **PROPOSED COST**

- A. Failure to state all costs associated with the service being provided including disclosure of any anticipated travel, printing, or other miscellaneous costs may result in such fees not being honored or paid by the County.
- B. Total price shall include all costs (including, but not limited to, travel, overhead and other incidental expenses) to provide services and deliverables identified in the Scope of Work in the Request for Proposal.

Pricing Items & Categories	Price
1) High resolution oblique – County-wide (outlined in sec. IV)	\$ 152,740
2) Medium resolution oblique - County-wide (outlined in sec. IV)	\$ 91,606
3) Low resolution oblique – County-wide (outlined in sec. IV)	\$ 72,703
	\$
4) Image Viewing Software and Licenses	\$ 14,500
5) Maintenance & Support - Annual	\$ 2,900
6) Software Options and cost Change Detection	\$ 11,264
Change Detection viewing software on cloud	\$ 5,000
7) Other costs or expenses: Orthos from 3 inch flight	\$ 88,339
Orthos from 6 inch flight	\$ 35,587
Orthos from 9 inch flight	\$ 18,351
Grand Total	\$

Additionally, please note the \$2,900/year maintenance fee is not charged in year 1.

Sanborn can offer 3D Mesh at \$6,264.80.

Sanborn hosting of oblique data is \$500/month. *for 12 months = \$6,000*

Integration with other software packages is \$9,000.

\$ 182,240

Section 8 – Technical Approach

The Sanborn oblique imagery solution provides users with digital, natural-color oblique aerial imagery of the earth's surface, taken from a nominally consistent altitude and oblique angle over the project area. Using the application software, users can have access to oblique views from the four cardinal directions, as well as a nadir (vertical) view, all fully georeferenced, of any location within the AOI. The viewer solution includes an ArcGIS plugin, as well as an optional browser-based standalone application that can be integrated with other enterprise applications. Sanborn's oblique solution provides aerial triangulated oblique imagery for all 5 views that can be used for precision relative measurement (3-pixel accuracy) to measure and analyze objects, as a background to overlay with other GIS data, and as source data for creating precision 3D models.

Sanborn has reviewed the County's Request for Proposal No. 72-16: Oblique Photography Services and is pleased to submit our technical proposal for this project. Our goals are to:

- Provide high quality, accurate, crisp, interpretable, as well as aesthetically pleasing imagery to the County.
- Provide a suite of software with viewing and analytical functions to assist you in extracting information to support your applications for tax assessment, planning and zoning, property records, parks, transportation planning, traffic and accident analysis, elections administration, public safety (police and fire), public utilities (water and sewer), economic development, public safety, and environmental and natural resource management.

This technical approach section describes in detail the following information:

- Summary and Overall Work Flow
- Acquisition Resources
- Sensor Technology & Accuracy Specifications
- Data Acquisition Planning and Execution
- Imagery Data Production
- Analyzing Change (3D Change Detection)
- Viewing Software
- IT Infrastructure
- Summary of Oblique Deliverables
- Estimated File Sizes
- Internal Quality Control Processes
- Optional and Alternate Proposals
- Proposed Schedule

Each step within the production process includes details regarding Sanborn's Quality Assurance (QA)/Quality Control (QC) protocols. As a company with ISO-certified quality control procedures, Sanborn ensures the products provided to the County will adhere to high quality and accuracy standards. Each production phase is reviewed and accepted before proceeding to the next phase.

Summary and Overall Workflow

Sanborn owns, operates and controls the entire workflow process that comprises a successful oblique product delivery to the customer. All the data acquisition is accomplished using aircraft and sensors owned by Sanborn, and all the end-to-end production workflow steps are performed in Sanborn's Colorado Springs production facility, with support provided as necessary by our branch locations. The major phases of an oblique project lifecycle are illustrated in the flowchart below:

OBLIQUE IMAGERY PROCESS FLOW sanborn



- Pre-Acquisition Planning
 - Flight Plans
 - Control Plans
 - Coordination with air traffic control (ATC) and mission execution planning
- Data Acquisition
 - Imagery Acquisition
 - Ground Control Point Survey
 - Field Data QC
- Data Acquisition QC
 - Image Quality Validation
 - GPS-IMU/Raw Positioning Quality Validation
 - Re-flight Determination
- Geo-positioning
 - Process GPS-IMU
 - Process Survey Data
 - Aerial Triangulation
 - Control Point Checks
 - Accuracy Validation using independent check point survey data
- Image Enhancement and Color Balancing
 - Radiometric Enhancement of Images
 - Color Balancing
- Product Generation, Independent QC and Delivery
 - File Management and Metadata Preparation
 - Independent QA/QC of the data against client specifications
 - Delivery and Dissemination of final products in client-specified formats/platforms

Acquisition Resources

Sanborn recognizes that one of the most critical phases of this program is acquisition of the aerial imagery. Timely collection of consistent, high quality aerial imagery and related data is the foundation for generating high quality oblique/nadir imagery and other derivative data products.



Our aerial team provides the following benefits to the County:

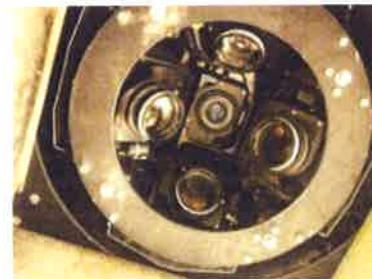
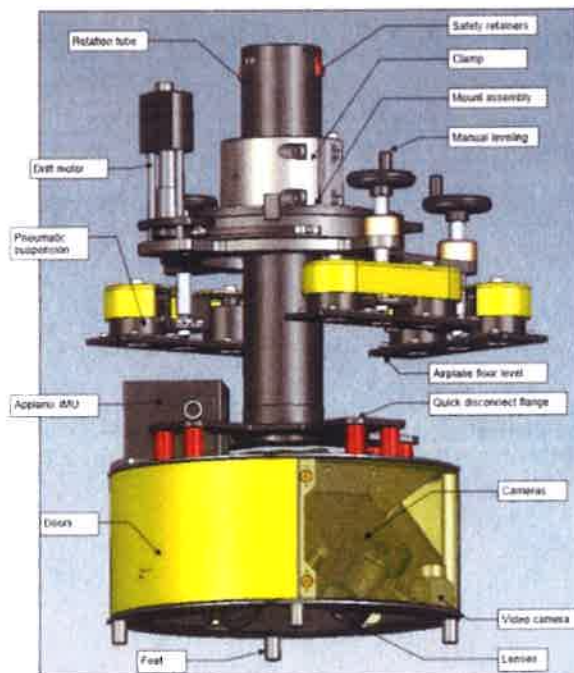
- Extensive, wholly-owned data acquisition resources to ensure collection within optimal windows of opportunity;
- A fleet of 8 aircraft, including high performance multi-engine and turbine-powered aircraft and one that is equipped with dual ports, capable of performing acquisition with multiple sensors;
- Four (4) oblique sensors, each of which collect imagery from 5 viewpoints

- AGPS/IMU units to collect photo center position and direct exterior orientation data for imagery; and,
- Aircrews and photographers with extensive experience in the State of Missouri and surrounding region.

Sensor Technology & Accuracy Specifications

Sanborn proposes to utilize the Multi-camera Integrated Digital Acquisition System (MIDAS) oblique imagery sensor for data acquisition. Sanborn has fully implemented the MIDAS digital aerial camera technology and adapted our workflows to maximize the advantages of the system. Developed by Track'Air, this sensor consists of five (5) views created by four (4) cameras each tilted at 45 degrees and arrayed in 90 degree arcs around one (1) vertically mounted camera. The camera system is interfaced with a dedicated, computerized acquisition control system that collects precise position and orientation information for each image at the instant of exposure. The cameras employ laboratory calibrated lenses. The camera calibrations for each mission are further refined in the aerial triangulation process. Dedicated boresight calibration flights are conducted periodically to tune-up the calibration parameters.

The geo-referencing accuracy of the post Aerial Triangulation (AT) solution is better than 3 pixels individually in X, Y and Z directions. This is achieved by using the Sanborn Oblique Geo-referencing process, which is performed by running a combined bundle block adjustment of both nadir and oblique images in one integrated AT solution – a process that is unique in the industry.



Digital Camera Specifications (Nikon)	
Device and Type	Multi-cameras Integrated Digital Acquisition System (MIDAS)
Sensor Configuration	5 Nikon D800E DSLR Cameras
Bands and Registration	3 color channels (red, green, blue)
Calibration Information	Factory calibration
Oblique Viewing Angle	45 degrees
Focal Length	50mm Nadir, 85mm Oblique
Pixel Size	4.89 microns
CCD Dimensions	7360 x 4912 (36 megapixels)
Radiometric Resolution	8-bit in all channels (RGB)

Data Acquisition Planning & Execution

Flight Planning

Sanborn has designed the project so that all imagery is acquired during the hours of approximately 10:00am to 2:00pm, when the sun angle is at a minimum of 35 degrees, which helps to minimize shadows.

Sanborn will carefully plan all missions to ensure that the resulting data will be compliant with the requirements set for the project and will review our proposed flight and ground control plans with the County prior to mobilizing any field or airborne resources. Proposed plans will be provided to the County at least one (1) week prior to mobilization. The following table presents our proposed acquisition specifications for the project.

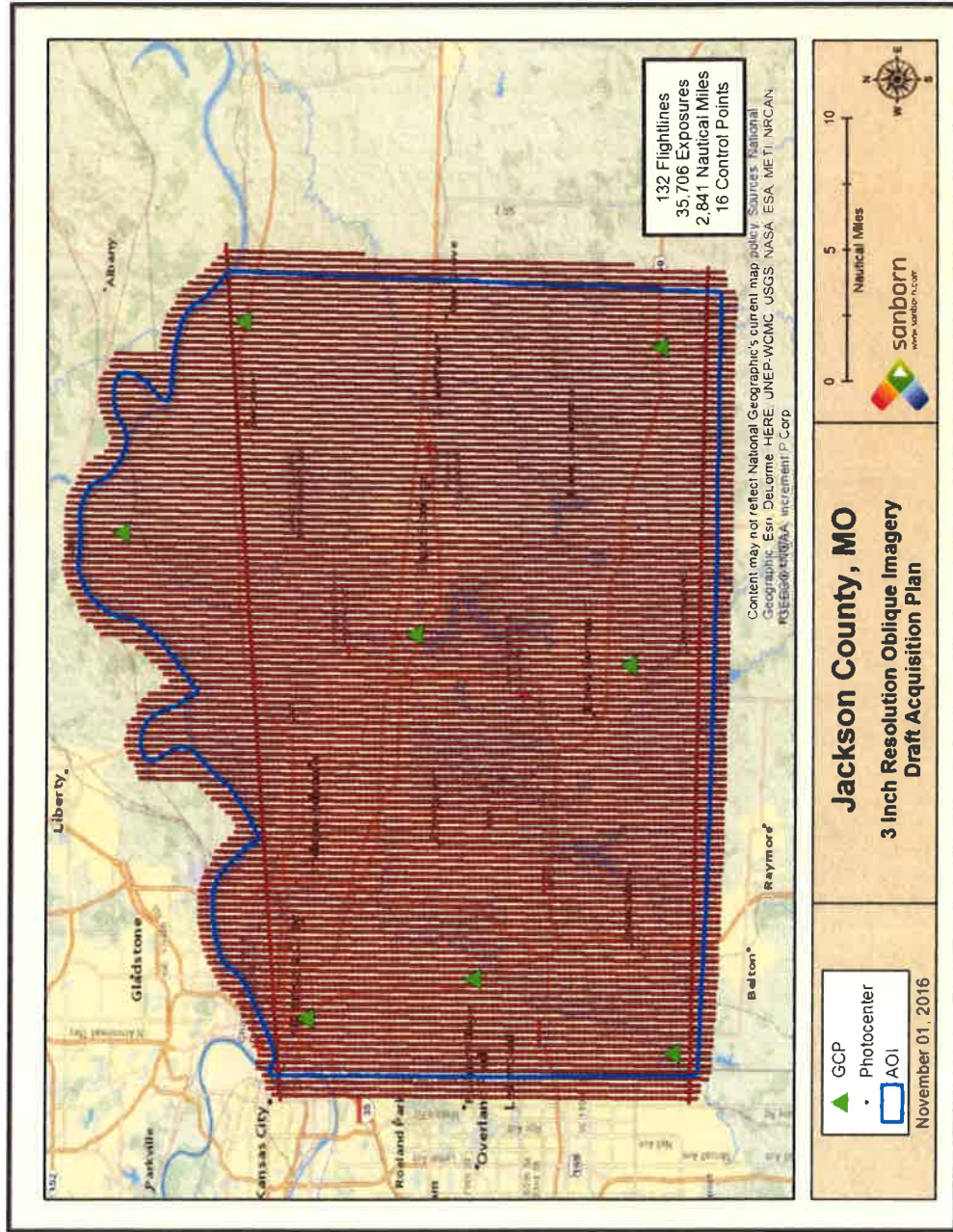
Imagery Acquisition Specifications			
GSD	3-inch	6-inch	9-inch
Proposed Sensor	Track'Air MiDAS 50/85	Track'Air MiDAS 50/85	Track'Air MiDAS 50/85
Focal Length	50mm Vertical 85mm Oblique	50mm Vertical 85mm Oblique	50mm Vertical 85mm Oblique
Flying Height Proposed	2,532' AGL	5,064' AGL	7,716' AGL
Aircraft Speed	130 kts	175 kts	175 kts
Sidelap	35%	35%	35%
Endlap	60%	60%	60%
Images Per Square Mile	318.8	89.1	44.1
Disk Space Per Square Mile	14.84 GB	4.15 GB	2.05 GB
Sensor Platform	Multi-Engine Fixed-Wing Aircraft		
Radiometry	3-band, 14-bit per channel RGB		
Acquisition Date	February, 2017, conditions permitting*		
Acquisition Time	~10am – 2pm		
Sun Angle	35 degrees or greater		
Conditions	Snow free, leaf off, no flooding. No clouds, cloud shadows, haze, smoke, precipitation, or other ground obscuring conditions on more than 5% of imagery. Winds calm.		
* Please note that the County has set impossible specifications for the acquisition. The requirement for 35 degree sun angle cannot be met in January, so Sanborn has planned for a February flight. It is also unlikely that snow-free conditions will prevail. We will need to discuss acquisition parameters with the County, and determine what factors are of the greatest importance – a January acquisition, or technical parameters. Shadows will be unavoidable due to the mandated winter flight, but Sanborn will attempt to minimize problems with shadows by flying areas with high buildings as close to solar noon as possible.			

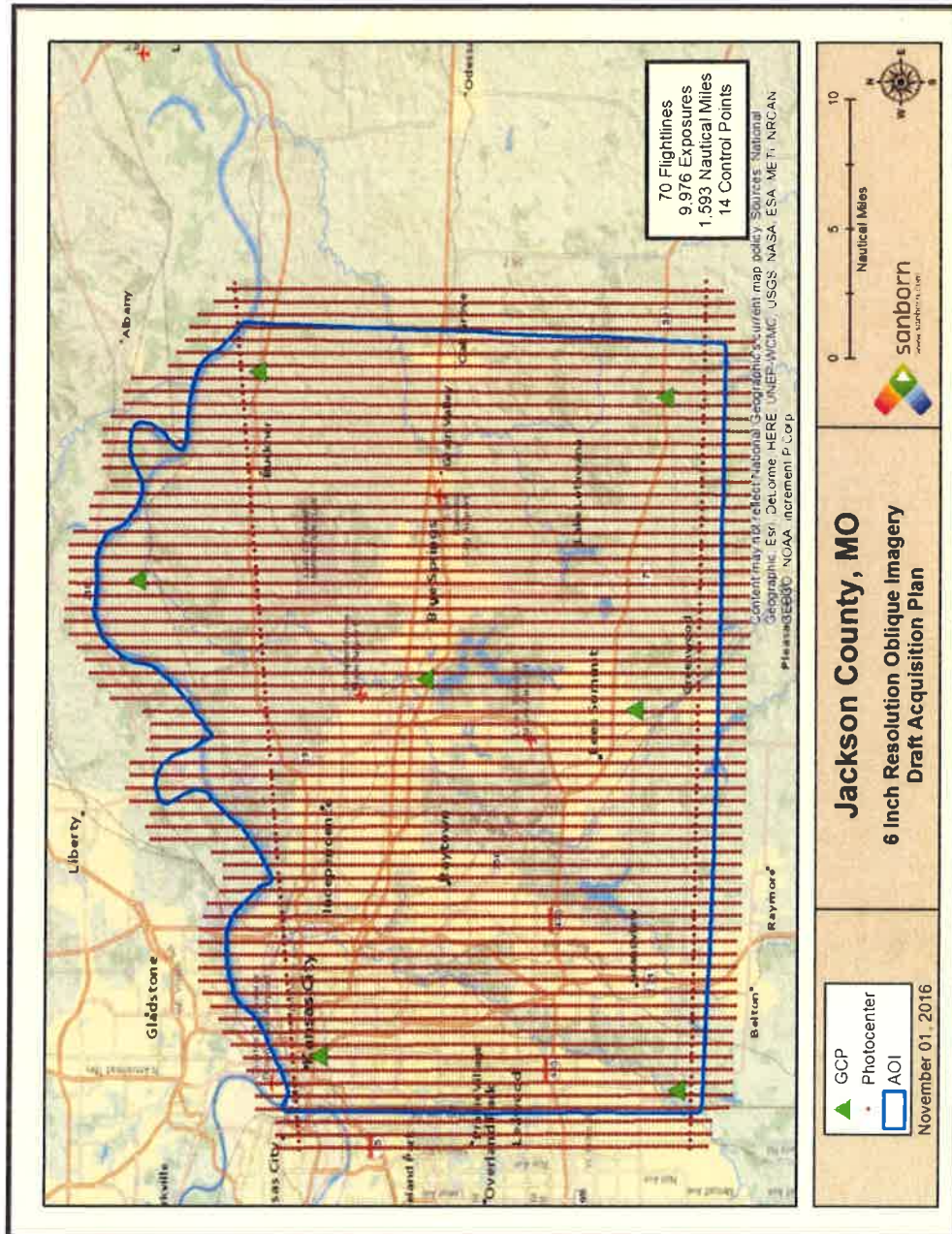
A summary of procedures and considerations in flight mission planning is as follows:

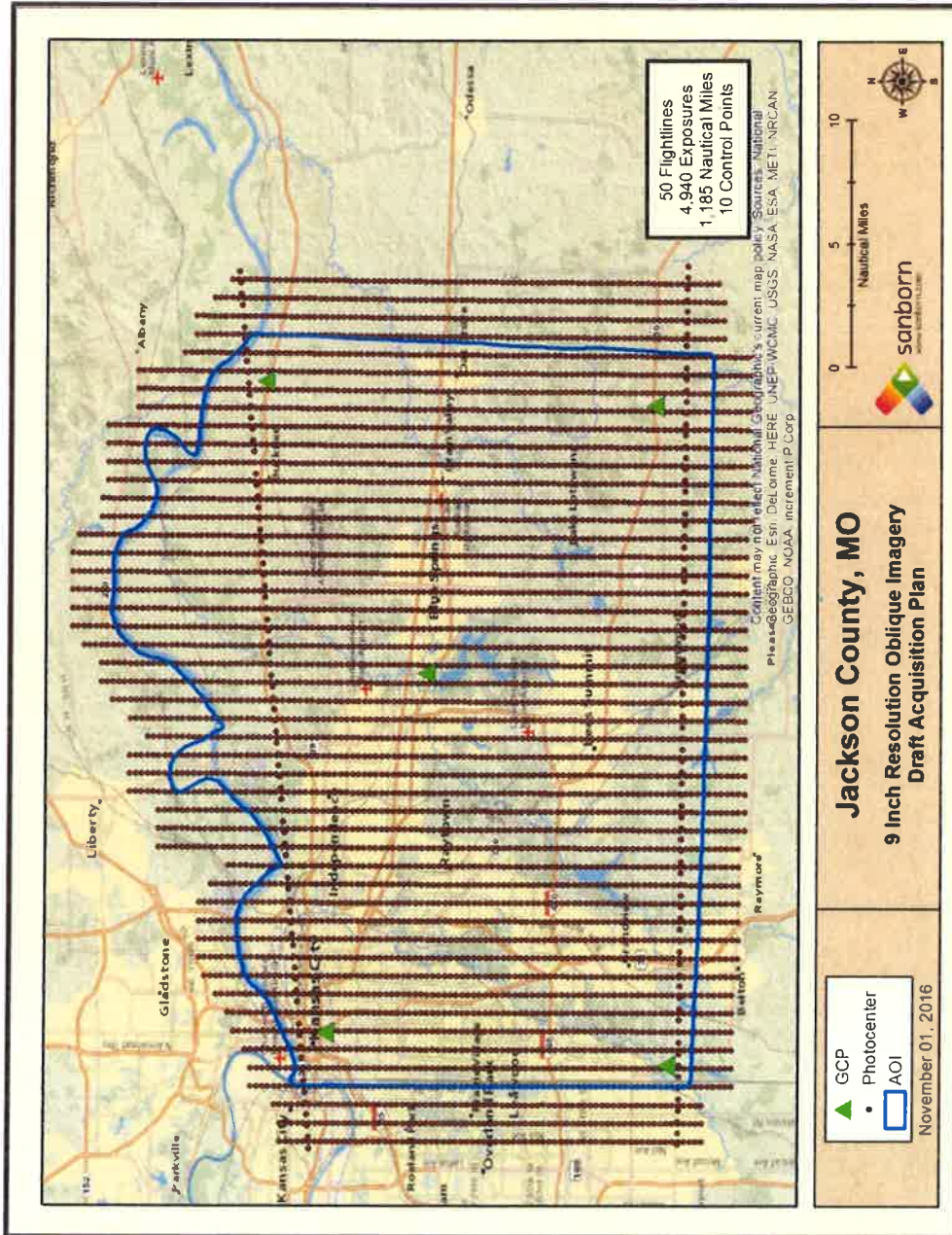
- Sanborn will prepare a digital flight line layout for the project area(s) using Track'Air software, taking into account the configuration of the proposed MIDAS aerial camera, and the resolutions required for the imagery under the County's solicitation. These parameters determine the flight altitude and footprint of each nadir exposure on the ground, and correspondingly, the quantity of flight lines and exposures, as well as the ground control requirements if orthorectification is to be performed. Flight lines usually extend continuously across the project area; however lines may be optimized in order to account for terrain, areas with tall structures, water bodies, airspace restrictions, and issues related to sun angle, lighting, and shadows.
- End lap and side lap will be as shown in the table above, and will be adjusted as needed to ensure collection of quality imagery in areas with unique terrain or built infrastructure considerations.
- Sanborn's flight plan will contain the following information:
 - Projected flight lines
 - Flight line numbers
 - Intended coverage
 - Approximate number of exposures
 - Flight altitude

Flight Diagrams

Draft flight plans for the County's project are presented on the following pages.







Mission Execution

Photography is accomplished by flight crews who will be temporarily based in close proximity to the collection areas. We will attempt to acquire imagery in the shortest possible timeframe to minimize radiometric differences in the final image database. The acquisition team will monitor flight conditions and determine, in coordination with Sanborn's project manager and the County, when to initiate imagery collection flights. Sanborn will hold daily calls with the County during the acquisition season to determine if optimal conditions for flying exist, and if there are any special issues to be considered, such as smoke from fires, or unusual flooding.

Sanborn relies on a variety of sources to determine the suitability of conditions for acquisition. Our first and primary source is the flight crews and surveyors in the areas of interest. Flight crews are trained to observe and report the conditions as they see them on the ground and in flight. We will also coordinate with and defer to the County if there is any question regarding suitability of conditions. Finally, there are a variety of ways to observe conditions remotely, including NOAA weather reporting stations, daily weather satellite reports, weather video cams, and a variety of public sources that can be accessed for detailed observations.

Imagery will be captured for each area of interest at the desired resolution. Mission profiles will be programmed into the Track'Air Flight Management System, which is integrated with the sensor systems on board each aircraft. This computerized system assists the aircrews with mission navigation and sensor operation, ensuring that imagery is collected in accordance with the flight plan. Aircrews are also able to mark flightlines or exposures where turbulence, clouds, or other factors that bear on the quality of the imagery may be an issue, so it can be accessed rapidly following the flight, and assessed for recollection, if necessary.

Operational Considerations

Sanborn's aircrews are highly familiar with the airspace system in the region, and know how to navigate safely and efficiently within its boundaries. They have acquired imagery over some of the busiest and most sensitive airspace in the United States, including New York City and County; Washington, DC, which required on-board Secret Service security personnel; Chicago O'Hare; and Los Angeles County. All flights will be coordinated with the appropriate civilian and military air traffic control authorities. Our aerial team has the relationships needed to gain access to sensitive and restricted, or controlled airspace.

Sanborn's aircraft are equipped with all of the communication and navigation avionics required to operate safely in the federal airspace system. All of our aircrews are appropriately licensed and qualified, and our aircraft are operated and maintained in accordance with applicable Federal Aviation Administration (FAA) regulations at all times.

Post-Acquisition

Flight Logs will be prepared following each mission. The pilot or system operator will prepare a flight log for each flight day containing the date, project name, aircraft used, and names of crew members. In addition, the following information is recorded for each flight line: altitude, sensor number and any other comments relative to the flight conditions. These flight logs will be submitted digitally to Sanborn's acquisition manager for review. All AGPS, IMU, and image data will be downloaded the day of collection. Preliminary processing of the ABGPS data is performed to ensure the data is complete and produces accurate photo center coordinates.

Status Reporting

Sanborn requires flight crews to electronically submit a daily status report to the acquisition manager immediately after that day's operations. The report states what occurred during the day. If the crew didn't fly, they report why. If they did fly, they report what was flown, and the weather and ground conditions. This information is also used to plan the following day's operations.

After receiving the reports from the field, the Sanborn production office in Colorado Springs will compile the results into one daily status report to send to Sanborn's project manager. This report will be reviewed and sent to the County on a daily basis.

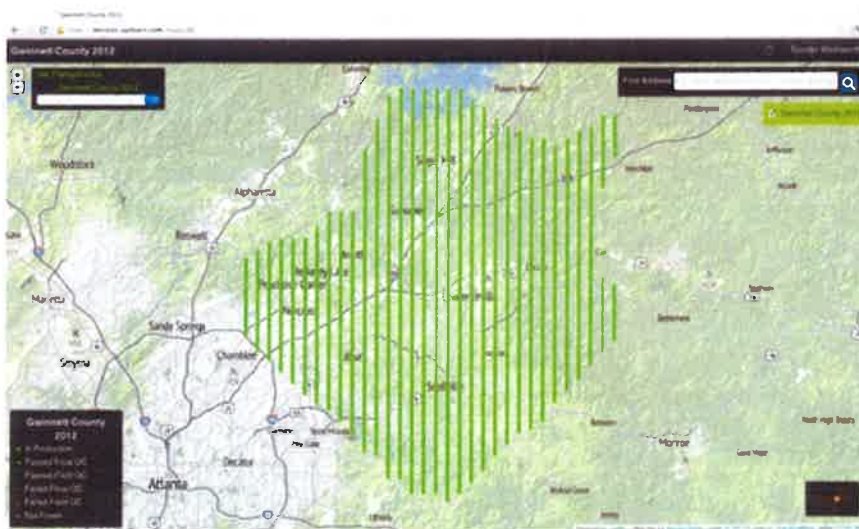
Online Flight Status Tool

Sanborn has developed an online status tool which will be used to report flight status during the acquisition process. The online status tool will update each morning, and will complement the reporting information provided daily by the Sanborn project manager. The status tool will display the updated version of the flight plan shapefile(s) indicating which frames have been captured, reviewed, and/or accepted.

The County can identify the specific program stakeholders that they would like to have access to the online status tool. With a unique login, stakeholders have the ability to access the acquisition status at their own convenience. This tool facilitates the sharing of the project information between Sanborn and the County's stakeholders.

This technology will benefit this project and the County's project manager by:

- Providing easy distribution of acquisition status updates, alleviating reliance on email or phone calls
- Providing information in a format accessible from any internet connected device
- Providing access to multiple the County-approved stakeholders simultaneously, which will relieve the County's project manager from answering calls from stakeholders regarding status.



Sanborn Online Flight Status Tool

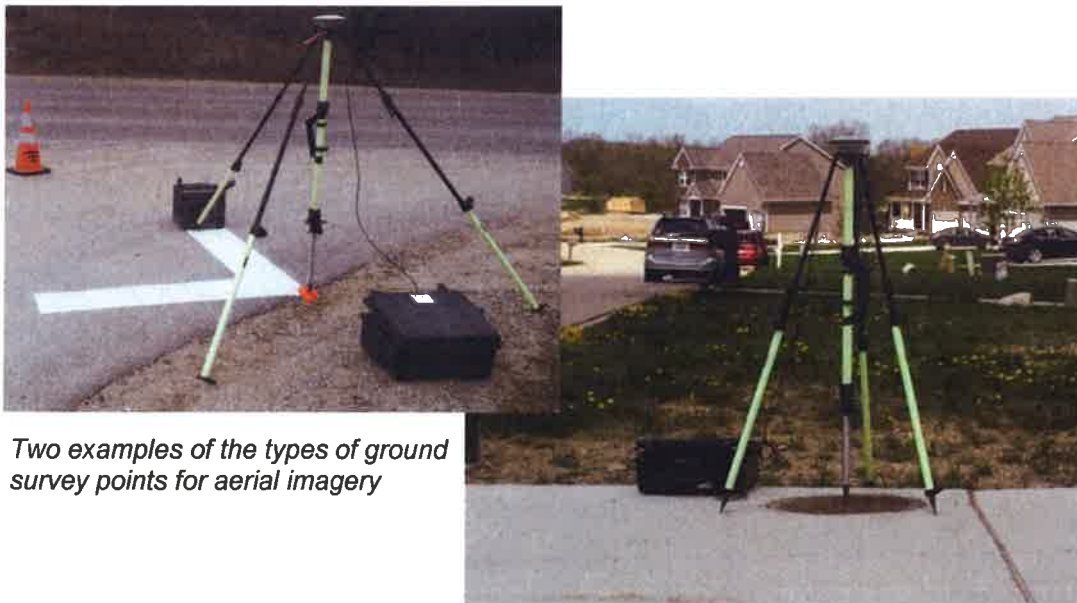
Ground Control Surveys

While Airborne GPS (AGPS) and IMU technology will serve as the primary means for georeferencing, a framework of ground control is needed to serve as checkpoints and constraints for the AT solution. Sanborn proposes to use existing survey points where possible, and will supplement with new points as needed to support production. As with all aerial mapping projects, Sanborn's Certified Photogrammetrists (CPs) will evaluate the ideal location(s) for the required ground survey points based on the design of flight blocks, the location of flight lines, the terrain within the flight block, and the accessibility of the land parcels within the block. Based on this assessment, Sanborn may choose to place panels of material or paint in the form of an "X" or "V" shape and at an appropriate size to ensure visibility within the aerial imagery. In some cases, a photo identifiable (PID) survey point is selected in the field and surveyed, eliminating the need for a panel to be placed. This strategy is employed if disturbing the land is not possible, or if a survey is conducted after the aerial imagery has been collected.

GPS survey techniques will be used to establish or verify ground control. Control positions will have a precision of 2nd Order, Class I (2-I, 20 ppm), and vertical 2nd Order Class II precision, as defined in the FGDC-STD-007.2-1998, Geospatial Positioning Accuracy Standards Part 2: Standards for Geodetic Networks. A report documenting the ground control survey will be provided.

Spatial Reference System

Sanborn will ensure that all land survey and airborne GPS/IMU data collection and processing procedures generate control coordinates that result in an aerotriangulation solution that accurately georeferences all deliverable data in the Missouri State Plane Coordinate System, West Zone, in US Survey Feet, North American Datum 1983 (NAD83) for horizontal and North American Vertical Datum 1988 (NAVD88) for vertical reference.



Two examples of the types of ground survey points for aerial imagery

Quality Control: AGPS/IMU Field Procedures

Prior to the actual photography missions, Sanborn will review the AGPS system installation. This involves:

- Checking the GPS antenna location on the aircraft
- Checking the GPS receiver to aerial camera connections
- Re-measuring the offset vector from the antenna to the camera's front lens node (if necessary)

Sanborn's AGPS approach consists of the following steps:

- Recovering or establishing suitable base station locations within the project area as appropriate to the accuracy specifications for the project.
- Validating the boresighting of the camera and AGPS system. AGPS/IMU boresight calibration is performed when the camera or IMU has been moved.
- Collecting, processing, and interpolating the AGPS data to derive camera station coordinates and rotations at each instant of exposure.



Boresight Calibration Process

In order to facilitate collection of imagery with the best possible radiometric and geometric properties, Sanborn ensures the completion and currency of two (2) independent camera calibration/verification processes. The first is the laboratory calibration performed by the manufacturer. The second is Sanborn's internal camera calibration and verification procedure. Each time a camera is installed in an aircraft, a complete geometric calibration is performed in order to ensure the accuracy of the platform. This process is referred to as a "boresight." A report detailing Sanborn's methods and procedures verifying the accuracy of any sensor used for the proposed project will be provided as a deliverable.

Quality Assurance/Control: Field Data Acquisition

Sanborn has the following process steps and protocols in place in order to ensure that all data acquired in the field is collected in accordance with the specifications of the project:

- All the data collection teams maintain daily field logs. The daily logs are uploaded to a central FTP location for Sanborn team managers to review on a daily basis.
- The GPS/IMU and survey data is uploaded to the FTP location at the end of each day. The data is downloaded by team members in the Colorado Springs office within 24 hours and the data is reviewed to ensure its integrity and to confirm the equipment has not malfunctioned.
- The entire dataset is downloaded to hard drives and shipped to Sanborn's office overnight. The data is thoroughly reviewed in the office and the rejected instances of the data are reported for re-flights and re-collection within 48 hours.

Quality Assurance/Control: Imagery

Sanborn takes every possible measure to ensure that mission planning, operational conditions, precision aerial cameras, and computerized flight management systems all work together to result in the acquisition of high quality, error-free imagery for the project. We quality check the entire imagery data set three times before accepting it for exploitation.

As each image is acquired, a snapshot of that image is visible to the aircrew on a monitor. Our photographers view this snapshot at the time of capture and then again post-mission, before sending the imagery to the office.

When an imagery data set arrives at the office, it is immediately backed up. Thereafter, it is processed to the final image. This processing occurs quickly, as dedicated, high-capacity workstations utilizing a distributed processing system are used for the task. After the imagery is processed, a technician reviews the imagery a third time. The technician looks for details which may not have been visible in the snapshot and confirms that the image processed correctly. Checks performed by the technicians include:

- Review of the imagery for density, contrast, hot spots, clarity, shadow and highlight detail, and overall quality. Images are reviewed to ensure they have an unobstructed view of the ground with minimal variation of ground illumination and color variations due to lighting and cloud shadows and minimal artifacts such as haze, glint and glare caused by reflected sunlight.
- Technicians will also check each line of imagery for:
 - Foliage conditions—Leaf off is required
 - Adherence to the flight plan—the editor will review the imagery to ensure that the specified flight plan has been successfully executed.
 - GSD—the technicians will confirm that the specified GSD has been achieved.
 - Departures from flight heights required to produce the desired image scale shall not exceed minus two percent (-2%) or plus five percent (+5%)
 - Crab—Crab in excess of three degrees (3°) may be cause for rejection of a flight.
 - Tilt and Tip—Tilt of the camera from vertical at the instant of exposure shall not exceed three percent (3%), nor shall it exceed five percent (5%) between successive exposure stations. Average tilt over the entire project shall not exceed 1%.
 - Forward overlap—the forward overlap will be examined to ensure that it falls in the appropriate range for each acquisition area.
 - Side overlap—the side overlap will be examined to ensure that it falls in the correct percent range for each acquisition area.
 - Anomalies—any other anomalies that could affect the final product will be examined, such as exposures settings, pixel drop out, etc.

If the technicians identify the need for any re-flights, they immediately email the flight crew the required parameters. Our goal is to accomplish this review within three days of acquisition of the imagery. Sanborn understands that unacceptable imagery will be re-flown at no additional cost to the County. All re-flight coverage will overlap the accepted imagery by at least two exposures, and will be captured using the same sensor type that performed the initial acquisition.

Imagery Data Production

The following sections describe Sanborn’s strategy for producing oblique imagery that will meet the needs of the County and its partners. We believe image accuracy and image quality go hand in hand, and have established a process that incorporates quality control throughout all steps. As a standard practice, AT is utilized to ensure the best possible fit of oblique imagery to the ground. Concurrently, the collected imagery is taken through several steps of processing to correct for uneven lighting, color, and contract, while retaining the brilliancy of the native Nikon D800E exposures.

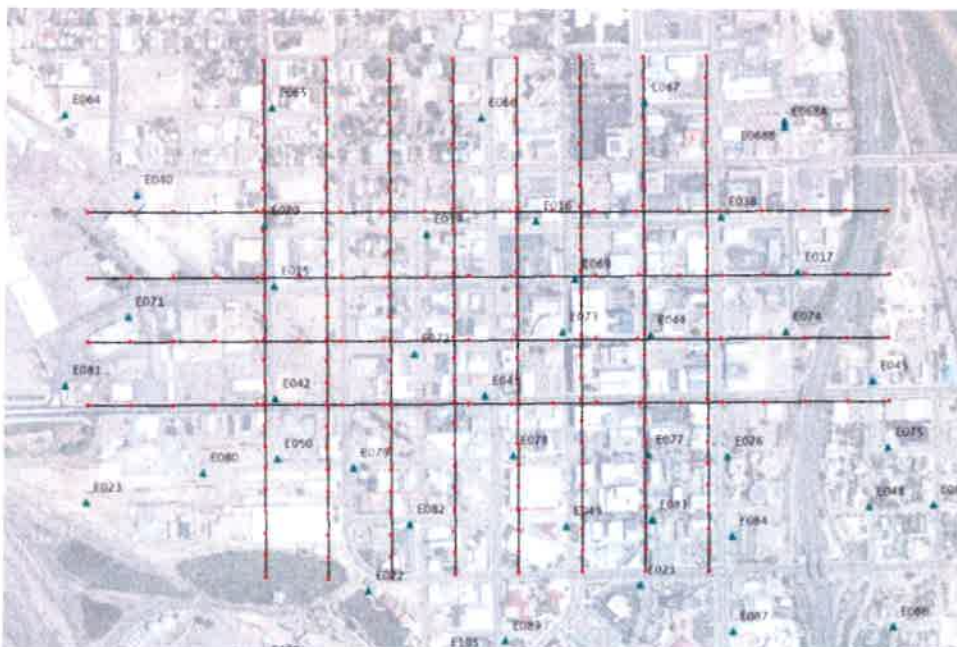
Geo-positioning of Oblique Imagery

AGPS/IMU Post Processing

All AGPS/IMU data will be downloaded from the aircraft the day it is collected. Sanborn will use the latest version of Applanix MMS kinematic AGPS post-processing software to process all AGPS/IMU data. In a combination of AGPS data, the expected accuracy of the orientation of the photo exposures will be 0.10 meters in position and approximately 20 to 30 arc seconds in tilt, roll and heading. Once a final solution is achieved, the photo center coordinate positions, as well as the trajectory file (SBET), will be exported for use in AT.

Aerial Triangulation (AT) and Accuracy Specifications

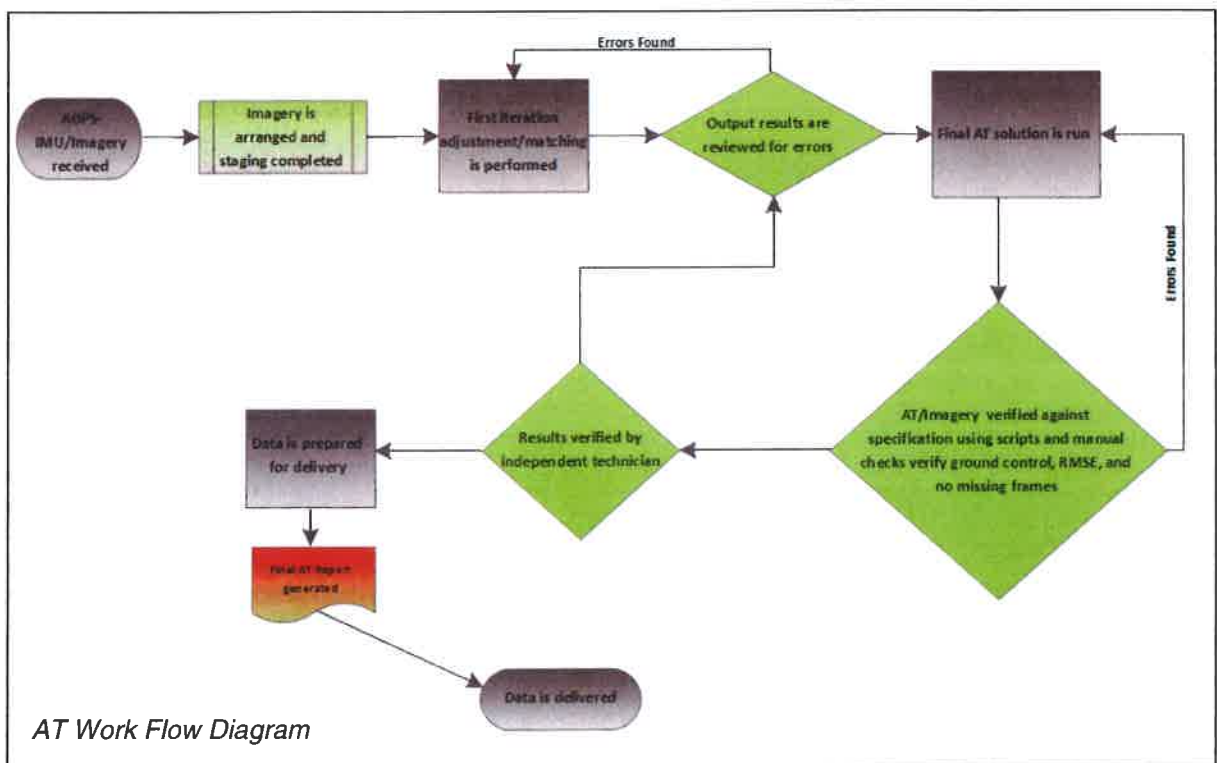
Each Sanborn oblique imaging system is calibrated at our boresight range in Colorado. The test range contains over 100 ground control points to allow for complete calibration of the system. The planning of the boresight flight is a critical component to achieving high accuracy with the system; therefore, Sanborn collects imagery with high overlap (80% forward and 60% side overlaps), at two (2) altitudes, and with opposing flight directions. The results of the boresight calibration are applied to each subsequent flight during the AT process.



AT for an oblique imaging system employs similar techniques of conventional AT; for example, both include the use of AGPS/IMU data and ground control points. However, conventional AT software was not designed to incorporate oblique imagery for tie point generation or to handle the large amount of data collected with the system. There are two approaches Sanborn considers to ensure the highest accuracy possible for the nadir and oblique imagery:

- Perform AT with the nadir image only and, using the results, compute the orientation of the oblique imagery thus assuring a singular orientation system; or,
- Perform point matching on all nadir and oblique frames and utilize additional parameters; e.g. trajectory and timing information into a bundle block solution. This approach allows the identification and removal of errors associated with the individual cameras within the system and with the GPS trajectory. This method allows for tight quality control through all steps in the process, maximizing the resultant accuracy of all images in the block.

With both solutions, AGPS/IMU and ground control are key elements in assessing the final accuracy of the imagery.



Post-AT quality control is performed using an independent software solution designed to evaluate the relative and absolute accuracy of the AT solution. The user is able to measure ground control points as well as user identifiable points throughout the block. A report is generated complete with a summary of statistics for each point measured, allowing for immediate evaluation of the block accuracy. The AT report will be provided to the County, as well as Esri shapefiles with footprints, centroids, and acquisition metadata for each image.

Quality Assurance/Control: Aerial Triangulation

The quality of the AT solution is proven by low values of the error residuals in the least squares adjustment. Very low values in the residuals indicate that the ground control is free of survey errors because it fits the photogrammetric measurements. The quality control steps outlined below will be followed to help ensure the best quality adjustment. The project boundary will be identified to ensure that triangulation coverage includes the entire project area.

- Checkpoints will be used and evaluated as previously discussed above
- Intermediate triangulation results will be thoroughly reviewed by the Lead Technician and the Data Processing Manager.
- Final triangulation results will be thoroughly reviewed by the Lead Technician, Data Processing Manager, and the Manager of Production.

Image Processing and Color Balancing

The Sanborn Image Processing Team is responsible for receiving and processing the raw imagery data after it is acquired by the Acquisition Team in the field. The Image Processing Team works in tandem with the Geo-positioning Team to ensure that all collected data meets the predefined customer specifications. Once it has been determined that all data meets customer specifications, the Image Processing Team is responsible for imagery enhancement and color balancing the data. The Image Processing Team follows a well-defined work flow process that emphasizes quality control, as illustrated on the following page.

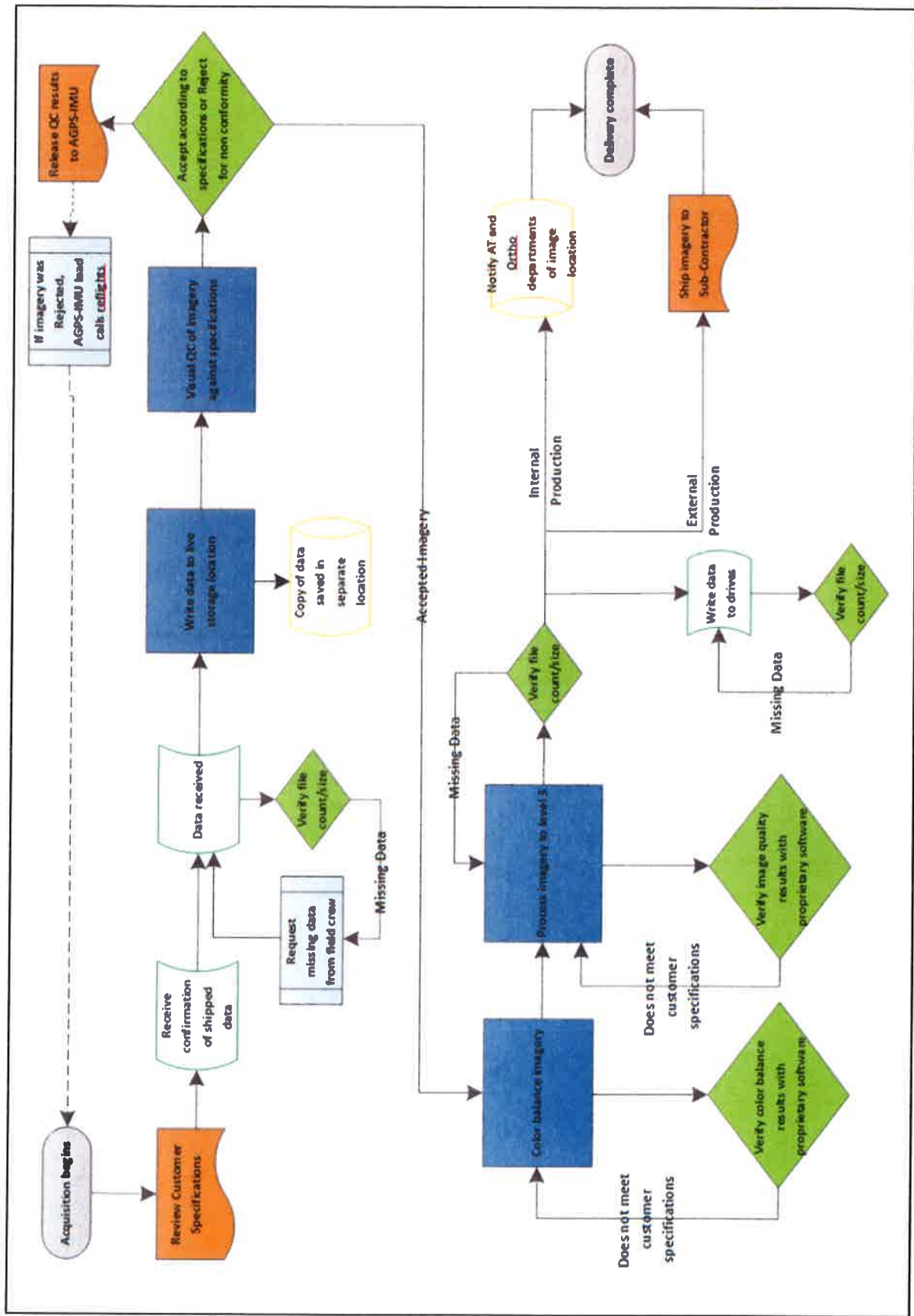


Image Processing Work Flow Diagram

Initial Image Review

The Image Processing Team receives the collected raw mission data from the Acquisition Team and downloads the data to the Sanborn system for storage, backup, and processing. The raw imagery data is imported into Adobe LightRoom for initial review. LightRoom is used for the review and processing of all imagery data because it is capable of handling a large volume of imagery (areas of interest are sometimes comprised of hundreds of thousands of individual image frames).

Imagery Enhancement and Color Balancing

Once the entire area of interest (AOI) has been collected and all imagery has been accepted, the imagery is rotated, enhanced, and color balanced in order to produce a final product that meets strict image quality guidelines. Before applying any image enhancements to the data, all oblique camera frames (images captured by non-nadir oriented cameras) are rotated 180 degrees in order to appear right-side up.

Once the oblique imagery has been rotated, the imagery is enhanced and color balanced using LightRoom. LightRoom allows the image processing technician to perform interactive, real-time image manipulation and lets the technician see how the adjustments applied affect either selected images, or the entire set of imagery all at once. The appropriate imagery enhancements and color balance are found by trial-and-error.

The following enhancements are performed in order to maximize the image quality and produce visually acceptable imagery:

- **Sharpening:** A sharpening algorithm (e.g. a masking algorithm) is applied to the imagery in order to bring out scene details without increasing the noise observable in the imagery.
- **Noise reduction:** A spatial and/or color noise reduction algorithm is applied to the imagery as necessary. The purpose is to reduce any noise present without degrading the image detail in any way.
- **Histogram stretching (color balancing):** A global histogram stretch is determined, which will be applied to all imagery. The stretch will have the following characteristics:
 - It will not clip scene details in the dark regions or the bright regions of the imagery (the ends of the image histogram)
 - It will enhance and bring out details in the dark regions of the histogram without enhancing noise (i.e. brings out details in the shadows)
 - It will maximize the dynamic range of the histogram and improve the overall contrast and appearance of the imagery
 - It will produce color balanced imagery with natural and realistic looking scene colors

The enhancement and color balancing process will result in imagery that has improved scene details and allows the viewer to see scene content more clearly than as presented in the raw imagery.



Left: Raw Image and Histogram; Right: Enhanced Image and Histogram

During the process of determining the appropriate sharpening, noise reduction and histogram stretch to apply, the image processing technician will test an assortment of imagery containing a wide variety of scene content in order to find the enhancements that will work best for the entire AOI. Applying global enhancements across the entire set of imagery will allow seamless viewing of the data.



Seamless Mosaic of Individual Image Frames (Corpus Christi, Texas)

After the appropriate sharpening, noise reduction and histogram stretch is applied to the entire set of imagery, the imagery is exported from the software. As a final QC check, the imagery is then processed through Sanborn proprietary software for further analysis. This analysis will ensure that the mean histogram values for all of the imagery fall within a specified and acceptable digital count range.

Orthorectification of Nadir Images

Sanborn uses a highly sophisticated, proprietary software package for orthophoto creation. This software draws upon DEM/DTMs, digital sensor information, digital aerial imagery acquired for the project, and AT data to rectify each digital image. The rectification corrects for inherent geometric distortions in the image that are caused by terrain variance, earth curvature, and camera orientation in relation to the ground. The terrain surface used by Sanborn's software is in the form of a triangulated irregular network (TIN), not a regular grid DEM or DTM. The TIN eliminates waviness around sharp terrain breaks, such as steep embankments, road edges, railway grades, and hydrographic features. The County's existing DTM will be used as the terrain data input for orthorectification. The ortho processing software uses the cubic convolution sampling technique, which yields high accuracy and excellent aesthetic quality. Cubic convolution is the industry standard algorithm for the rectification of digital orthoimagery. It relies on a 4 x 4 (16-pixel) kernel and a cubic algebraic function.

The completed images will be delivered to the County in industry standard .JPG file format, with .JGW world header files for georeferencing. Imagery will be provided at the specified low, medium or high spatial resolution for each given area. Imagery will be 3-band, 8-bit per channel RGB true natural color.

Quality Assurance/Control: Final Image Review

Images will be checked for consistent color, tone and contrast; minimal variation of ground illumination and color variations due to lighting and cloud shadows; minimal artifacts such as haze, glint and glare; and adherence to the contracted specifications. Once the imagery has been enhanced, color balanced and reviewed, it is ready for delivery to the County.

Application Software

The Sanborn oblique imagery solution is delivered with two options for viewing:

1. A browser-based viewer called the Sanborn Oblique Analyst®
2. An ArcGIS desktop extension.

Sanborn's oblique imagery is provided with an ArcGIS plug-in at no additional cost that enables users to ingest the oblique imagery into ArcGIS. However, in order to gain maximum usability from the oblique imagery, and to ease distribution, the Sanborn oblique imagery solution can be delivered with an optional browser-based viewer which can be deployed on your own servers, Sanborn servers (for an additional fee), or in a cloud hosting environment. Both applications are capable of cataloging, organizing, and retrieving the imagery rapidly, and making it available to users for analysis. The software is capable of retrieving vector data stored in ArcSDE 10.2.2.

Esri Desktop Extension

The Sanborn-provided Esri desktop extension currently works with 10.x versions of ArcGIS. The extension allows the user to import the nadir view of the imagery directly into ArcGIS, and access to tools ordinarily available within the ArcGIS desktop environment. If access to the oblique views is desired, the user need only click on a button to automatically launch the Sanborn Oblique Analyst® software, which then zooms to the same location.

performance of the services and delivery of the deliverables. When payment in full has been made, Sanborn will retain sole and exclusive ownership of all right, title and interest in and to the work materials and deliverables; and, the County will be granted rights, title, and interest in and to the deliverables as expressly set forth in the Sanborn Oblique Imagery and Sanborn Oblique Analyst® Software End-User License Agreements (EULAs) provided in the Appendix.

Summary of Deliverables

Sanborn will provide a copy of all deliverables as outlined in the table below. All data will be quality controlled and in full compliance with the standards and specifications set forth by the County in the RFP.

Summary of Deliverables	
Deliverable	Description
Oblique imagery	<ul style="list-style-type: none"> ▪ Oblique images in .JPG/.JGW format at the desired resolution ▪ 3-band, 8-bit per channel RGB true natural color
[Optional] Orthorectified nadir images	<ul style="list-style-type: none"> ▪ Orthorectified nadir images in .JPG/.JGW format at the desired resolution ▪ 3-band, 8-bit per channel RGB true natural color
Oblique Extension - Esri	<ul style="list-style-type: none"> ▪ Esri ArcGIS Desktop plugin, ArcGIS 10.x compatible, enabling use of the oblique imagery in the Esri environment.
Sanborn Oblique Analyst®	<ul style="list-style-type: none"> ▪ Browser-based viewing, measuring, and analytical software
Metadata, Reports, and Documentation.	<ul style="list-style-type: none"> ▪ Flight Plan and Logs ▪ Sensor calibration report ▪ FDGC compliant metadata in XML format ▪ Project report covering data acquisition, land surveying, AGPS/IMU processing, aerotriangulation, production process, quality control and accuracy assessment. ▪ Esri shapefiles with footprints, centroids, and metadata for each image
Training and Support	<ul style="list-style-type: none"> ▪ On-site training session ▪ Email and telephone support
Deliverable Media	<ul style="list-style-type: none"> ▪ Delivered on USB-2 External Hard Drives, or on DVD 2.0, 4.7 GB single sided (4.3 GB usable) disks ▪ FTP downloads can be made available for interim deliverables, such as pilot data sets

Project Management

Sanborn's project management approach rigorously applies the Project Management Institute (PMI) model, which exceeds the requirements of ISO 9001:2008. Sanborn understands that an upfront investment in planning results in the best outcome for the entire project lifecycle. The PMI model encompasses the following knowledge areas and process phases:

- Integration
- Scope
- Time
- Cost



- Quality
- Human Resources
- Communications
- Risk
- Procurement

Project Definition

Project definition at Sanborn begins with the preparation of a project charter that encompasses all elements of the program. The project charter establishes the overall goals, vision, organizational structure, project structure, deliverables, management plans and approach, technical baseline, schedule, cost, subcontract management, quality, and other key elements of the program. All the methods used to plan, monitor, and control the project are also identified in the project charter.

A key element of the project definition is the development of the project schedule in our Earned Value Management (EVM) system, in addition to multiple supplementary tracking systems. This project management and production tool is used to develop and track all project resources and the schedule throughout the life of the project. The EVM schedule is the single source for all project status and tracking throughout the life of the project. A baseline contractual schedule is maintained in addition to multiple scenario schedules.

Project Initiation

Sanborn believes that the key to any successful project is continuous customer communication. Soon after contract award, Sanborn will request a preliminary planning meeting to identify any specific items that may have arisen after reviewing numerous proposals that may not have been in the original RFQ. Once this information is gathered and the project charter is complete, Sanborn will request a kickoff meeting where Sanborn's management team and appropriate Sanborn production staff will meet with appropriate County staff to:

- Review the technical requirements of the project against the proposed technical plan contained in Sanborn's proposal.
- Review the sources that are to be supplied by the County against the requirements and expectations of Sanborn's proposed work plan.
- Review the acquisition plan requirements and flight plans.
- Review the preliminary work plan (and the quality control processes and procedures) as presented in Sanborn's proposal against defined delivery areas or work packages.
- Review the estimated resource plan.
- Review the project-specific Quality Plan presented at the meeting by Sanborn. Included will be a review the product acceptance procedures, methods and criteria that will be used by the County to determine product conformance with product specifications.
- Review the proposed project schedule and finalize interim and final delivery dates
- Review the schedule requirements by specific work tasks and the interdependencies of the sources of information to be supplied by the County.

- Define the parameters of a pilot or prototype project where the proposed procedures will be tested for their ability to meet product specifications and/or the ability of the product specifications to meet the needs of the County.
- Define a formal change management process designed to effectively and efficiently track proposed modifications to contracts. This process will allow the County to make cost and benefit tradeoffs based on an analysis of the requested changes. It allows for the design, development, and implementation of modifications to production processes and procedures to be made in a controlled manner.
- Define all communication protocols and procedures that are necessary for effectively ensuring that both parties to the contract are informed about the production departments' progress on each project task, that the sources are effective for the purpose intended, and the status of deliverable product reviews by the County.

We anticipate that the kickoff meeting will be held via web conference. We welcome a site visit to Sanborn's production facilities at any time throughout the course of the project.

Production Schedule

Mr. Benham will review the production schedule contained in Sanborn's proposal with the County during the project initiation meeting. This draft schedule, based upon our review of the RFP, may be re-evaluated after the completion of the pilot or prototype project and before the balance of the project is started, depending upon comments received by the County, if they impact the scope of work. It is anticipated that the County will review the pilot deliverables and provide comments to Sanborn within five days of receipt. If necessary, the resource requirements will be input/revised in the Primavera system at both of these milestones before production of the balance of the project commences.

Sanborn will commit to meeting the County's requirement to deliver the required oblique imagery and viewer within 60 days from completion of acquisition activities. Optional product selections such as orthoimagery will be scheduled in coordination with the County during the project initiation phase.

Financial Schedule

Mr. Shawn Benham, Sanborn's project manager, will develop an internal set of financial budgets based upon the input into the EVM system and an invoice and payment schedule that is tied to production and/or terms and conditions in the contract. Mr. Benham is responsible for the timely and accurate submission of invoices to the County. The County is obligated to remit timely and accurate payments in accordance with the terms and conditions of the contract.

Preferred Payment Schedule

Sanborn proposes a milestone invoice schedule in coordination with the delivery schedule:

- 10% upon project initiation
- 10% upon survey and flight plan approval
- 30% upon acquisition completion
- 10% upon approval of pilot project

- 30% upon initial product delivery
- 10% upon final acceptance

Sanborn is willing to negotiate other terms for invoicing if desired.

Quality Management System

Sanborn has earned ISO 9001:2008 certification and is registered with Platinum Registration, Inc. ISO 9001, a Quality System Standard, is a series of five international standards that provide guidance in the development and implementation of a specific Quality Management System. With Sanborn's ISO 9001:2008 certification, the County is assured that:

- The requirements and specifications of the project have been thoroughly and rigorously evaluated and documented
- The production processes and procedures employed for the project are appropriate and adequate to produce the results intended
- The production processes and procedures are controlled and results will be consistent and repeatable
- Documentation will be maintained that allows for evaluation of the processes and procedures to eliminate the source of nonconformities and to facilitate continual improvement of the processes and procedures
- Adequate facilities are available to meet the needs of the project
- Sufficient numbers of competent and adequately trained employees are working on the project

Sanborn's Quality Management System has been developed to ensure that adequate and continuous control is in operation for all activities affecting product quality. Where specific regulatory requirements affect our processes, our procedures and instructions will be designed or revised to meet such requirements. Sanborn employs methods and techniques that foster continuous improvement and good business practice.

Sanborn places an emphasis on problem prevention rather than dependence on detection after occurrence. Every effort is made to perform operations and quality-related activities correctly the first time. The Quality Management System includes a formal review of the parameters affecting product quality from conception to contractual fulfillment. Whenever necessary, corrective and preventive actions are implemented to ensure continuous improvement.

Responsibilities

Sanborn staff members are aware of what they are authorized to undertake and are responsible for achieving. This is ensured by documentation of responsibilities and authorities in specific procedures. All employees are responsible for following applicable policies, procedures, and work instructions. Additionally, every employee has the responsibility and authority to:

- Initiate action to prevent the occurrence of any nonconformities relating to product, process, and the Quality Management System
- Identify and record any problems relating to the product, process, and the Quality Management System

- Initiate, recommend, or provide solutions through designated channels
- Control further processing and delivery of products until the deficiency has been corrected
- Ensure that the County's source materials and other property, including intellectual property, is logged, utilized, stored, and returned in a controlled manner

Expectation of the County's Contribution

Sanborn proposes that the County's roles and responsibilities under this program will be to:

- Coordinate and communicate with Sanborn as needed. Respond in a timely manner to requests for information, data, and meetings or conference calls;
- Coordinate with Sanborn regarding environmental conditions during the acquisition process, and provide information to assist with the decision to conduct or defer acquisition operations;
- Negotiate with Sanborn regarding fees and scheduling, and other administrative matters, if needed;
- Process all contractually-related documents in a timely manner;
- Make final choices where there are options associated with the technical specifications, and state any requirements and specifications that differ from those in the RFP, if any changes are desired;
- Perform reviews and quality control checks of interim (pilot) and final deliverables in a timely manner, and communicate the results to Sanborn, or coordinate with Sanborn and a 3rd-party QC contractor; and
- Review and pay Sanborn's invoices in a timely manner.

Communications Management

Customer communication and status reporting is the most important aspect of project management. The continuous communication between Sanborn and the County will provide insight to the project process and eliminate gaps in communication on technical and schedule issues. Sanborn has a proven method of communication with our customers, and will review with the County the best method to ensure constant contact throughout the project lifecycle.

Communication requirements will be incorporated and documented in the work plan. The specific requirements for each project are unique; therefore, the tracking and reporting tools and procedures necessary for effectively managing the project are established specifically for the County's project and maintained throughout the term of the contract.

Meetings and Conference Calls

Meeting minutes from project team meetings and conference calls will be produced and distributed by Mr. Benham. These minutes shall include descriptions of the issues discussed during the meeting, their resolutions, and the necessary follow-up. All project records, including correspondence, reports, invoices, and specifications, will be maintained in the project files by Mr. Benham.

Project Status Reporting

Sanborn is committed to successful internal performance management and to providing customers with easy access to the status of their projects. We accomplish this by using a variety of proven tools.

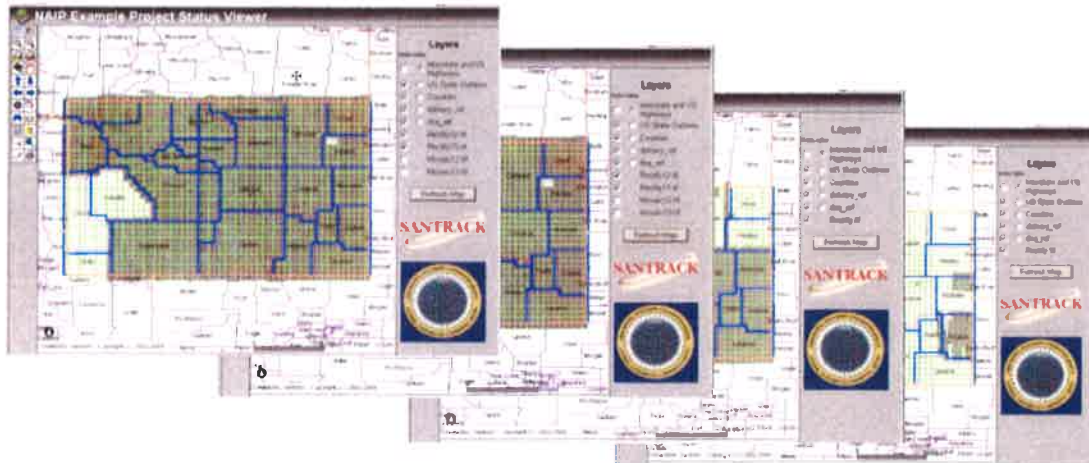
Project Status Reporting is one of the most critical aspects of communication for large projects with many players and variables. As a result, Sanborn utilizes three primary technologies to provide update information about the project to the County, including real-time web-based tracking reports.

1. **Written Status Reports** – Mr. Benham will submit a monthly Project Status Report to provide project team members with a common understanding of the important issues, procedures, and goals associated with the project. The report summarizes project activities completed over the past reporting period and those planned over the next similar time period. Information addressed in the Project Status Report includes the following:
 - Major activities completed during the most recent reporting period
 - Summary of data production status, including but not limited to listing of data accepted by the County and the status of the County's review of delivered data
 - Description of current project issues and procedures
 - Activities to be completed over the next reporting period
 - Data production forecasts for the next reporting period
 - List of requested action items
 - List of outstanding issues/action items
2. **Status Calls** – Weekly status calls can also be held with the County to coordinate project activities and to review open issues noted in the status report. Exact times will be established with the County during the project initiation meetings. It is the Sanborn project manager's responsibility to facilitate this call, document new actions, address the status of open issues, and assign action items. A sample agenda is as follows:
 - Major issues and action items completed for a specified time period
 - Critical issues and actions not completed and their potential impacts including, but not limited to, the County's review of deliverables and the schedule for source data delivery
 - Production status
 - Action items for next reporting period
 - Upcoming action items and questions
3. **Web-Based Reporting/Program Status via SanTrack** – Sanborn recognizes the importance of enabling our clients to gather information on the status of their projects during acquisition and production. Being able to anticipate deliveries and to gather information on your projects status without relying on project management or production personnel can be very important (if not critical) at times. Understanding this need, Sanborn developed a system that provides our clients with the ability to view the status of their projects through an Internet connection.

SanTrack is Sanborn's method of visually tracking projects internally while at the same time allowing our clients to view the status of their projects. This browser-based viewing system allows clients to check the status of their projects at any time. SanTrack, which is

strictly for viewing purposes, is accessible via the Internet using standard web browser. No additional client-side software is required. SanTrack allows for daily progress from all team members to be entered and displayed. Our Program Manager will ensure the SanTrack website is updated on a daily basis for acquisition and on a weekly basis for all other tasks.

The web-based online status viewer will reflect a status for each tile or block as appropriate. Information posted to the status reporting site includes, but is not limited to, progress for aerial data acquisition, post-processing, quality control and delivery of data.



Project home pages provide hyperlinks to project reference documents, specifications, productivity and quality data, project status reports, technical support requests, and can be the primary mechanism for distributing status reports. Instituting this for the County would greatly improve project communications and tracking. This technology will benefit this project and the County by:

- Providing easy distribution of project updates, alleviating total reliance on email, faxes, etc.
- Providing summary and detailed level reporting, as well as sorting information by category.

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WHEREAS, pursuant to section 1030.4, Jackson County Code, 1984, the Director of Finance and Purchasing is required to submit any purchase under an existing government contract which exceeds \$25,000.00 to the Legislature for approval; and,

WHEREAS, the Director of Finance and Purchasing recommends these awards as indicated under the existing government contracts due to the higher volume discounts offered to larger entities; and,

WHEREAS, a transfer is necessary to cover the cost of this equipment and services; and,

WHEREAS, the County Executive recommends this transfer; and,

WHEREAS, additionally, a portion of this transfer in the amount of \$18,600.00 will be allocated for a McCune property survey using an existing County term and supply contract; now therefore,

BE IT RESOLVED by the County Legislature of Jackson County, Missouri, that the following transfer be made within the 2016 Park Fund: