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**INVITATION FOR INTERVIEW  
ISLAND COUNTY WASHINGTON  
GEODETIC MONUMENTATION NETWORK AND DIGITAL  
ORTHOIMAGERY**

**MARCH 2007**

**ISLAND COUNTY PUBLIC WORKS DEPARTMENT  
P. O. BOX 5000  
COUPEVILLE, WA 98239-5000**



## SECTION I. GENERAL CONDITIONS AND PROVISIONS

### A. Objectives

The purpose of this project is threefold:

1. Establish a high precision county-wide geodetic monumentation network to be used for improving and coordinating ground survey activities, and to the extent it will improve the geoid model in the immediate area, improve the 2001 Island County Lidar digital topography dataset;
2. Acquire aerial orthoimagery across the entire Island County, WA, consisting of approximately 210 square miles, using a USGS certified digital frame camera that meets or exceeds local imagery requirements and ASPRS standards.
3. Create transportation GIS products that streamline planning, inventory, maintenance and/or communication processes utilizing the orthoimagery products.

### B. Issuing Office

A contract is anticipated to be issued by ISLAND COUNTY.

All technical inquiries concerning the project should be directed to Randall C. Brackett, PE, Assistant County Engineer ([randyb@co.island.wa.us](mailto:randyb@co.island.wa.us)). Questions will be accepted through March 26, 2007. All questions and answers regarding this RFP will be posted on ISLAND COUNTY's webpage: <http://www.islandcounty.net/publicworks/index.htm>. Interviews are scheduled for Thursday, March 29, 2007.

Questions regarding the Administrative procedures should be directed to:

George Anne Sherry  
Island County Public Works Department  
P. O Box 5000  
Coupeville, WA 98239-5000

PHONE: 360 679-7331    FAX: 360 678-4550    E-MAIL: [gannes@co.island.wa.us](mailto:gannes@co.island.wa.us)

### C. Proposals

This procurement is subject to a financial assistance contract between ISLAND COUNTY and WSDOT/Federal Highways Administration (FHWA) (see ~~STP-R Prospectus infunding applications in~~ Appendix A1 & A2). The Project Budget (see Appendix F) is provided to generally identify expected costs from which the total budget was established. The consultant will be required to comply with all terms and conditions under the provisions of WSDOT Local Agency Guidelines (see Appendix B "Using Consultants" "~~Local Agency Standard Consultant Agreement~~", Appendix C-1 "Local Agency Standard Consultant Agreement", "~~Using Consultants~~" and/or go online for more information: <http://www.wsdot.wa.gov/TA/Operations/LAG/LAGHP.htm>). Eight (8) paper copies of any proposal materials shall be submitted to ISLAND COUNTY. The proposals should indicate the proposed scope of work, key team

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members, consultant qualifications and experience, and timeline. The data will be held in confidence and will not be revealed to or discussed with competitors.

#### **D. Selection Criteria**

The contract shall be awarded to the consultant whose proposal offers ISLAND COUNTY the greatest advantage for the project technical, economic, and other factors considered by ISLAND COUNTY, as specified in Section II. ISLAND COUNTY reserves the right to reject any or all proposals, or parts thereof, and to negotiate the requested services and contract terms with the selected consultant. Final Project Scope and associated Costs will be negotiated with the selected Consultant only after the interview process is completed. In the event costs and scope cannot be agreed upon, the County may proceed with the next most capable consultant as determined in scoring information received in the submittal and interview process.

#### **E. Submission of Proposal**

ISLAND COUNTY requests that consultants intending to respond to this interview invitation send or deliver a Proposal to Randy Brackett. Proposals must be received by ISLAND COUNTY no later than 5:00 p.m. PDT on March 28, 2007. All proposals become the property of ISLAND COUNTY and will not be returned. ISLAND COUNTY is a public body as defined by Washington's Freedom of Information Act (FOIA). Upon receipt by ISLAND COUNTY all technical portions of proposals become "public records open to disclosure" under FOIA. Send proposals and "Letter of Intent" to:

Randy Brackett

ISLAND COUNTY PUBLIC WORKS DEPT

P. O. BOX 5000

1 NE 6<sup>TH</sup> AVE. (physical address for FedEx/UPS)

Coupeville, WA 98239-5000

#### **F. Type of Contract**

Contract will be executed on ISLAND COUNTY Standard Contract Form (see Attachment C-1). Submission of a proposal by a consultant will be understood as acceptance by that consultant of the contract language.

#### **G. Non-Discriminatory Practices**

ISLAND COUNTY and FHWA policies encourage participation by small disadvantaged business enterprises (SBE), including women business enterprises (WBE), and minority business enterprises (MBE) (see Appendix C-2 "Exhibit H - Title VI Assurances).

#### **H. Selection**

The Selection Committee will make a recommendation to ISLAND COUNTY's Executive Director consistent with ISLAND COUNTY's procurement process. The Selection Committee is composed of representatives from ISLAND COUNTY and the project partners.

#### **I. Schedule**

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The proposed schedule for this procurement is listed in the Preliminary Project Schedule (see Appendix G)

#### **J. Cost Liability**

All costs incurred in the submission of proposals or in making necessary studies, designs or computer benchmarks of estimates for preparation of the proposals are the sole responsibility of the consultant.

#### **H. Ownership of Deliverables**

ISLAND COUNTY will own all products delivered through this contract. In so doing, ISLAND COUNTY reserves the right to distribute these products within its organization and to the public as it sees fit.

### **SECTION II. SELECTION CRITERIA**

1. Project Team Key Members qualifications, experience and commitment to project schedule.
2. Project Understanding and Approach, overall work plan.
3. Project Team Firm(s) Capacity to provide quality assurance and control of resources and equipment necessary to deliver products within specifications.
4. References of successful relationships with clients in the recent past.

### **SECTION III. PROPOSAL FORMAT AND SCOPE OF SERVICES**

#### **A. Format**

This section identifies the proposal format and content. To speed and simplify proposal evaluation and to assure that each proposal receives the same orderly review; all proposals must follow the format described below. Failure to follow these instructions may cause elimination from further consideration.

The proposal must be organized and ordered into the following sections:

1. Introduction and Executive Summary
2. Team/Company Profile, Structure and Key Staff Résumés
3. Experience and Reference Summary
4. Response to Commercial Questions
5. Response to Technical Specifications
6. Technical Alternatives

Each section in the proposal must be clearly numbered and titled using the headings indicated above. Detailed requirements and directions for each section are presented below.

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### *1. Introductions and Executive Summary*

An Executive Summary should be prepared describing major facts or features of the Proposal. It is highly recommended that the Executive Summary include any diagrams that may assist readers in quickly grasping the proposed approach. The length of the Executive Summary should be brief, no more than two (2) page.

### *2. Company Profile, Structure, and Key Staff Resumes*

Describe your firm's organizational structure. Discuss how you anticipate organizing your project team for this project. Provide a listing and/or organizational chart of all project team members who will be involved in this project. Provide résumés for the project manager and other key managerial staff, plus résumés for key technical staff who will be assigned to this project. These persons must actually perform the roles proposed for them. If sub consultants are to be used, the responsibilities must be clearly defined. If you are proposing to subcontract some of the proposed work to another firm, similar information must be provided for each sub-consultant. The length of this section should be no more than one (1) page per firm.

### *3. Experience and References Summary*

Please identify up to three clients for whom you have provided services according to the three project objectives: geodetic control, orthoimagery-mapping services utilizing a digital camera, and GIS transportation application development.

### *4. Response to Commercial Questions*

- a) Potential impact of current workload on the proposed project. Cite specifically all major photogrammetric mapping and data conversion projects that require significant commitments of equipment and staff in 2007.
- b) Exceptions. Please describe any exceptions taken to the Scope of Services described later in this section of the RFP.
- c) Additional information requirements. Please list any other information requirements you may need from ISLAND COUNTY before commencing contract negotiations.

### *5. Response to Technical Specifications*

Consultant responses must clearly address each technical requirement detailed in Scope of Services and include a detailed description of specific capabilities to be used to meet each requirement. In the response, include a brief narrative of key steps. Note specifically any operations included or excluded that may differentiate your technical procedure from others. Discuss the procedures that will be used to produce a high quality orthoimagery and all other significant steps in the plan of operations. Include in your technical plan of operations your approach in completing the following items:

- a) Geodetic Control Monumentation Network
  - 1) Workflow process to create a control monumentation network including coordination with photo targeting for aerial imagery acquisition
  - 2) Means of accessing local knowledge of existing survey monumentation
- b) Aerial Orthoimagery
  - 1) Procedures Manual

- 2) Orthoimagery Production
- 3) How you will check positional accuracy
- 4) How you will ensure consistency throughout the region
- 5) Provide image samples of the two different resolution solutions detailed in the Scope of Services
- 6) Equipment and Software to be used
- 7) Describe the equipment (hardware and software), camera, GPS, Aircraft's
- 8) proposed for the orthoimagery acquisition, production, quality control, plotting, etc. Specify manufacturer/model of equipment and software version where appropriate.
- 9) Indicate the approximate age of equipment.
- 10) Orthoimagery Production and Quality Control  
Describe the orthoimagery production and quality control procedures used to verify the accuracy, completeness, consistency in image quality and overall integrity of the product
- 11) Production Schedule  
Verify and substantiate that your firm can complete the work in accordance with the schedule required. Cite projects where a similar amount of work was completed in a similar time frame. Prepare a detailed schedule that describes the tasks included within the technical plan of operations. Include the schedule/time line for the flight, pilot areas and all other deliverables. Provide an overview of the online project status application and how it will be deployed for this project as mentioned in the deliverables.
- 12) Response to Technical Specifications and Procedural Concerns  
Proposed solutions not meeting the requirements specified by a particular item in the RFP document shall be clearly outlined. Are there any technical and procedural concerns that may influence the proposed project? Describe any technical difficulties anticipated.
- 13) Technical and Production Support Required of ISLAND COUNTY
- 14) Based on your technical plan of operations, and previous project experience, explain when and where you will require support from ISLAND COUNTY personnel. Provide an indication of the number and duration of consultation and briefing sessions with ISLAND COUNTY staff.
- 15) Technical Alternatives  
Consultants may elect to propose alternative approaches if they can demonstrate technical, schedule, or cost advantages to ISLAND COUNTY keeping in mind this is still a "Full Digital Imagery Acquisition Project". The Consultant should cite the applicability of alternative approaches/procedures to the achievement of project objectives and the projected advantages to be gained through their use.

c) Examples of GIS Transportation Applications

**Scope of Services**

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The purpose of this project is to:

- A. Establish a high accuracy geodetic control network of monuments from which the survey community can provide greater accuracies. A level loop is desirable. The Consultant shall advise the County of opportunities to improve the geoid of Island County to better reflect topography within the immediate area of the project area. If possible, a refined geoid model may produce improved vertical data that enhances existing Lidar data. If economically feasible, this data may then improve the orthorectification of aerial imagery.
- B. Acquire orthoimagery utilizing a digital frame camera that meets or exceeds local imagery requirements and ASPRS standards across Whidbey and Camano Islands.
- C. Provide line details as follows:
  1. centerline of all roads (approximately 1,200 miles)
  2. edge of pavement of all public roads (approximately 588 miles)
  3. Street centerline striping (double line & skip striping)
  4. culvert crossings across all roads and all catch basins
  5. identify bluff edge and toe breaklines for Lidar/DEM dataset enhancement
  6. outline building structures for Assessor purposes (option not to be federally funded)

~~D. Provide point details including to:~~

- ~~1. visible survey monuments~~
- ~~2. water valves and fire hydrants~~
- ~~3. street signs~~

E.D. Create GIS products utilizing aerial imagery and related products for transportation purposes including, but not limited to:

1. Transportation planning such as incorporation of a road segment/intersection rating system for selecting road improvement projects
2. Graphical illustration of County's 6-year Transportation Improvement Program (TIP)
3. asset inventory of visible roadway retaining walls, road end seawalls, guardrails, signage, cross-culverts and/or catch basins
4. Dynamic Web page (possibly utilizing Google Earth) providing dynamic traffic counts according to road sections
5. Dynamic Web page (possibly utilizing Google Earth) for construction/hazards traffic public advisory

### **Project Deliverables**

The following specific products will be created and delivered as appropriate during the project timeline:

1. Preliminary Geodetic Control Monumentation Network map with aerial photo targets
2. Final Geodetic Control Network Map
3. Record of Survey for Geodetic Control Monumentation Network
4. Copy of flight log indicating date and time of day to produce orthoimagery for the project area.
5. Tiling index maps by County in geo-registered ESRI shapefile format showing county and community boundaries, flight lines, flight plan and tiling names in the associated dbf file.

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6. Camera specifications and ground control report.
7. FGDC Compliant digital orthoimagery metadata for each County.
8. Orthoimagery files shall be delivered to each County's contact person as Uncompressed Geo-TIFF. The vendor will develop tiling scheme but should not exceed 2000' X 3000' in size. Tile naming convention will include the County Code, the third and fourth digit of the lower left X and the first three digits of the lower Y coordinate and the year flown. (e.g. X=13297162.42 Y=324344.72 Census County Code = (to be provided) Year Flown 2007 ---- Tile name would be 1612932407)
9. Secured internet tracking application to check flight and deliverable status and QC corrections.
10. Countywide (that includes the ½ mile boundary extension) and Community Mosaics in MrSID format. As described in the schedule, the flight is to be completed by the end of June 2007. In order to assess the progress of the work and to allow for mid-course corrections, biweekly progress reports containing flight logs, index maps indicating areas flown, and problems/solutions will be required. This information will be part of the online project status website the consultant will develop.
11. GIS applications as agreed upon by County and Consultant within specified budget.

### **Ground Control Services**

All preexisting control derived will be utilized for the aerial imagery operation. This ranges from second order horizontal control, existing state PLSS remonumentation program along with references to the HARN system with first order horizontal and preferably second order vertical control and geodetic control monumentation made available through this contract. Any targeting work will be the responsibility of the consultant.

All control will be based on the following:

- Washington State Plane (North)
- Horizontal datum -North American Datum (NAD 83/91) International Feet second-order Class I.
- Vertical datum - North American Vertical Datum 1988 (NAVD88) International Feet, third-order class I.
- HARN adjustment, as needed.

### **Orthoimagery Services**

The project will be cost out to acquire two orthoimagery solutions. This will provide a basis for cost comparisons between resolutions. The following are general specifications of the two alternative products and pixel resolutions in preferred priority order:

Options Imagery Pixel Resolutions

Option #1 True Color Leaf On 6-inch native with a horizontal national map accuracy (NMAS) of 1"=100' ~~1-foot 2-foot~~

Option #2 True Color Leaf On 1-foot native with a horizontal national map accuracy (NMAS) of 1"-200' ~~2-foot 3-foot~~

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There is general interest in capturing IR imagery along with true color imagery for feature extraction analysis.

*Digital Aerial Camera* The consultant will use a suitable focal length and a direct digital ~~panoramic~~ camera for all data collection that meets or exceeds the requirements set in this proposal and meets USGS specification approval. On-board and ground based GPS and Inertial Measurement equipment must be deployed. A ground-based GPS unit supplements this data. The camera must be equipped with forward motion compensation (FMC). The camera must also be able to obtain a Global Position System (GPS) reference point at each principal point.

### *Flight Requirements*

#### 1. Flight Line

The consultant shall design the flight lines for the imagery, and make a layout thereof on a suitable map or photographic mosaic. Generally, the flight lines shall be parallel to each other and to the lengthwise boundary lines of the area to be photographed, and in a north-south direction.

#### 2. Weather and Sun Angle

Digital imagery will be taken in mid-late Spring of 2007.

Acquisition shall not be attempted when the ground is obscured by haze, smoke, dust, clouds or cloud shadows, and snow or ice. Solar angle must be at least 45 degrees or more above the horizon at the time of exposure (see Appendix E "Solar Chart"). The Flight Consultant shall give preference where possible to capture of shoreline at low tide. If not captured during standard flight lines a perimeter course shall be performed circumnavigating both islands at a low tide as determined by ISLAND COUNTY in consultation with the Consultant.

#### 3. Crab

Crab in excess of three degrees (3°) measured with respect to both lines of flight may be cause for rejection of a flight strip or any portion thereof in which the excess crab occurs. This includes relative crab between any two successive exposures.

#### 4. Tilt

Average tilt over the entire project shall not exceed one degree (1°).

#### 5. Aircraft

The aircraft to be used shall be adequately equipped with all essential navigational, geodetic, and orthoimagery instruments to meet and/or exceed airborne specifications of this project. A well-trained and experienced crew must operate the aircraft along with all equipment and instruments. An aircraft equipped with fully GPS enhanced navigational systems is required for all orthoimagery missions related to this project. Performance of the aircraft shall be adequate to complete the project in accordance with the technical specifications. Consultants shall briefly outline various sub-system configurations, particularly the following:

- 1) Mounting of GPS receivers and antennae.
- 2) Antennae offsets to the perspective center of the digital aerial camera.
- 3) Proposed use of one or more GPS receivers in the airplane.
- 4) The camera mount in the airplane.

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Also outline the accuracy and reliability of the system under operational conditions to insure compliance of technical specifications and requirements of this project. The design of the aircraft shall be such that, when the camera is mounted with all its parts above the outer structure, an unobstructed view is obtained, shielded from exhaust gases, oil, effluence, and air turbulence. No window of glass or other material shall be interposed between the camera and the ground to be photographed. The aircraft shall have a proven service ceiling with operating load of not less than the highest altitude requirements to secure the orthoimagery. It shall be equipped with two (2) GPS antennas and two (2) dual phase GPS receivers.

#### 6. Airborne GPS

The consultant will use differential airborne GPS capabilities during the acquisition of digital aerial imagery. The consultant will maintain a minimum of two ground base stations during the acquisition of airborne GPS. The aircraft will maintain constant lock with at least one base station during the mission. Use of the County's base station and/or the WSRN may substitute the requirement for consultant provided ground base stations (one GPS base station is located at the Coupeville Courthouse Campus and is connected by real time streaming to the WSRN; a second GPS is located on the roof of the Camano Island Annex, but is not connected to the WSRN).

Airborne GPS solutions shall be required to utilize dual-frequency GPS Systems during the aerial imagery missions. The consultant shall post-process the airborne GPS data relative to simultaneous observations collected at fixed land-based reference stations.

#### 7. Authorizations / Clearances

It will be the responsibility of the Consultant to acquire appropriate authorizations and clearances to fly this project. This will include, but not be limited to, obtaining clearance for entry into NAS Whidbey Air Station as well as all local public and private airfields. Advanced notice to the various control towers within Island County will need to be made in order to eliminate any interruptions in the flight.

#### *Image Requirements*

##### 1. Boundaries

The consultant will receive from ISLAND COUNTY the boundary coordinates for the project area.

The consultant will include an additional ½ mile beyond the boundary area of this project. See Appendix DC for reference map.

##### 2. End lap

The end lap will be ~~70-60~~ percent.

##### 3. Side lap

The side lap will be ~~40-30~~ percent.

##### 4. Substitute Imagery

In flight lines re-photographed to obtain substitute imagery for rejected imagery, all images shall comply with the end lap and side lap requirements. The joining end images in the replacement strip shall result in complete stereoscopic coverage of the contiguous area on the portion or portions not rejected.

5. All spectral bands panchromatic, color and color IR shall be captured and archived for other potential uses or requests in the project. Accuracy Standards

~~Orthoimagery shall comply with the American Society for Photogrammetry and Remote~~

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~~Sensing Accuracy Standards for Class 1 mapping requirements.~~ This imagery will be available for future applications without an additional data acquisition fee to ISLAND COUNTY.

#### *OrthoImagery Productions*

##### 1. Digital Terrain Model (DTM/DEM)

Current county DTM / DEM will be utilized for orthoimagery production. This data originating from the 2001 Puget Sound Lidar Consortium effort will be provided to the consultant by ISLAND COUNTY. The consultant will need to state in the proposal the methodology and accuracy assessment used in improving the Lidar dataset with Geodetic Control Monumentation Network, where possible.

##### 2. Interactive Image Mosaicking

Mosaicking shall be accomplished using automated methods. Join lines between overlapping images shall have minimal tonal variations, loss of buildings or building irregularities, and visible join lines. Images will be merged to help eliminate mismatches between tiles in brightness and tonal quality and to ensure that radically displaced features, such as buildings, are not distorted when orthoimagery tiles are edge-matched. Care will be taken to ensure tonal matching and featuring between images. Tiles will then be clipped from the mosaicked image.

##### 3. Final Image Quality Check

Images shall have their contrast and brightness values adjusted to meet the desired acceptance criteria based on the results of the pilot areas. The goal is to produce digital imagery of consistent tone and contrast across the entire project, as well as, within single images. ISLAND COUNTY understands there are no published standards in place to govern image tone and contrast, and that achieving perfection is not necessarily practical, or even possible. However, consultants should be aware that ISLAND COUNTY expects a high quality product, and will be reviewing all orthoimagery submittals carefully. The consultant will be responsible for enhancing the image quality of areas of high distortion. Careful photo selection and advanced image processing tools shall be used to correct excessive distortions resulting from elevated surfaces. This will include all bridges and overpasses.

Visual verification shall be performed by the consultant before submittal to insure image completeness and to ensure that no gaps occur in the image area or over edge coverage.

#### **No image tile cropping will be accepted.**

Detailed description on how the consultant will perform the stated quality checks must be outlined in the proposal.

#### *Data Delivery Format*

Imagery is to be delivered to County Representative in uncompressed Geo-Tiff Format on hard drives including the ½ mile extension boundary around the entire County.

#### *Quality Control Procedures*

To maintain consistency in the image quality across the region, standard quality control procedures will be created.

#### **County Supplied Resources**

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ISLAND COUNTY will make available service of its surveyor (Dave Hahn), WSRN GPS Base Station (COUPE), a Trimble Base Station located at the Camano Island Annex) and survey data located in the Coupeville Annex Building vault.

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**APPENDICES** (all Appendices are posted on the ICPW project webpage  
<http://www.islandcounty.net/publicworks/index.htm>)

APPENDIX A1: 2006-2007 STP-R Prospectus ~~1&~~

APPENDIX A2: 2007-2008 STP-R Prospectus ~~STP-R Prospectus and~~ Supplement

APPENDIX B: ~~————~~ WSDOT LAG Manual Excerpts for Using Consultants

APPENDIX C1-~~&~~: Contract Form

APPENDIX C2: Contract ~~Contract Form and~~ Exhibits A-M (includes Exhibit H – Title VI Assurances)

APPENDIX D: ~~————~~ Reference Maps

APPENDIX E: ~~————~~ Solar Chart

APPENDIX F: ~~————~~ Benefits to Island County ~~and~~, Project Task Durations and  
Budget

APPENDIX G: ~~————~~ Preliminary Work Schedule