

**KITSAP COUNTY**  
**DEPT. OF EMERGENCY MANAGEMENT**  
911 Carver Street  
Bremerton, WA 98312  
(360) 307-5871

**INTERLOCAL COOPERATIVE AGREEMENT TO PURCHASE LIDAR DATA**  
**KING COUNTY, WA. LIDAR PROJECT**  
**BY PARTNERS LISTED IN EXHIBIT A**  
**KC-\_\_\_\_\_-2015**

THIS AGREEMENT is between Multiple Partners (Exhibit A) all municipal corporations, and Kitsap County, a municipal corporation, all in the State of Washington.

WITNESSETH:

WHEREAS, The Interlocal Cooperation Act, as amended and codified in Chapter 39.34 RCW provides for Interlocal cooperation between governmental agencies; and

WHEREAS, Chapter 39.33 of the Revised Code of Washington provides for the intergovernmental disposition of property, and

WHEREAS, both parties are required to make certain purchases by formal advertisement and bid process, which is a time consuming and expensive process; and it is in the public interest to cooperate in the combination of bidding requirements to obtain the most favorable bid for each party where it is in their mutual interest; and

WHEREAS, the parties also wish to utilize each other's contracts where it is in their mutual interest;

NOW, THEREFORE, the parties agree as follows:

1. **PURPOSE.** The purpose of this agreement is to acknowledge the parties' mutual interest to jointly bid the acquisition of goods and services and disposition of property where such mutual effort can be planned in advance and to authorize the acquisition of goods and services and the purchase or acquisition of goods and services under contracts where a price is extended by either party's bidder to other governmental agencies;
2. **ADMINISTRATION.** No new or separate legal or administrative entity is created to administer the provision of this agreement. The Administrator of this agreement is the Director of Emergency Management of Kitsap County, Washington.
3. **SCOPE.** This agreement shall allow the following activities:
  - A. Purchase or acquisition of goods and services by each party acting as agent for either or both parties when agreed to in advance, in writing;
  - B. Purchase or acquisition of goods and services by each party where provision has been provided in contracts for other agencies to avail themselves of goods and services offered under the contract.
  - C. Disposal of goods by each party acting as agent for either, or both parties when agreed to in advance, in writing.

## COOPERATIVE PURCHASING AGREEMENT

4. DURATION OF AGREEMENT - TERMINATION. This agreement shall become effective upon signature of both parties for a one (1) year period.
5. RIGHT TO CONTRACT INDEPENDENT ACTION PRESERVED. Each party reserves the right to contract independently for the acquisition of goods or services and or disposal of any property without notice to the other party and shall not bind or otherwise obligate the other party to participate in the activity.
6. COMPLIANCE WITH LEGAL REOUREMENTS. Each party accepts responsibility for compliance with federal, state or local laws and regulations including, in particular, bidding requirements applicable to its acquisition of goods and services or disposal of property.
7. FINANCING. The method of financing of payment shall be through budgeted funds or other available funds of the party for whose use the property is actually acquired or disposed. Each party accepts no responsibility for the payment of the acquisition price of any goods or services intended for use by the other party.
8. FILING. Executed copies of this agreement shall be filed as required by Section 39.34.040 RCW prior to this agreement becoming effective.
9. INTERLOCAL COOPERATION DISCLOSURE. Each party may insert in its solicitations for goods a provision disclosing that other authorized government agencies may also wish to procure the goods being offered to the party and allowing the bidder the option of extending its bid to other agencies at the same bid price, terms and conditions.
10. NON-DELEGATION/NON-ASSIGNMENT. Neither party may delegate the performance of any contractual obligation, to a third party, unless mutually agreed in writing. Neither party may assign this agreement without the written consent of the other party.
11. HOLD HARMLESS. Each party shall be liable and responsible for the consequences of any negligent or wrongful act or failure to act on the part of itself and its employees. Neither party assumes responsibility to the other party for the consequences of any act or admission of any person, firm or corporation not a party to this agreement.
12. SEVERABILITY. Any provision of this agreement, which is prohibited or unenforceable, shall be ineffective to the extent of such prohibition or unenforceability, without invalidating the remaining provision or affecting the validity or enforcement of such provision.
13. LiDAR SURVEY DATA. Kitsap County has contracted with Quantum Spatial Inc. to provide public-domain high-resolution LiDAR topographic survey data in the Pacific Northwest. Exhibit C outlines costs associated with Puget Sound LiDAR Consortium's rate structure agreed upon with Quantum Spatial, Inc. under its contract terms and used in Exhibit B to define Quantum Spatial, Inc. project proposal. The proposal and cost structure is the basis of the King County LiDAR Project partnership to purchase LiDAR Data.

The jurisdictions or municipal partners in Exhibit A agree to participate in the King County LiDAR Project and to the costs outlined in the Exhibit. Kitsap County will act as the agent for each partner in Exhibit A and a signatory to this agreement to obtain the data described in Exhibit B from Quantum Spatial, Inc. The project, referred to as the King County LiDAR Project has a total costs of \$623,146.00. The Project Costs is a total of LiDAR services and a service fee for contract administration and Quality Assurance, which is 14% of the total Project costs. This Agreement is for a total cost of \$95,585.00 to include associated administrative and quality assurance cost noted in Exhibit A. Each LiDAR Partner listed in Exhibit A will be responsible for their obligated LiDAR costs and payments will be made per contract milestones as follows: (1) acquisition (50% of total costs), (2) delivery (30% of total costs) and acceptance (20% of total costs).

**COOPERATIVE PURCHASING AGREEMENT**

Accepted and Approved:

**CITY OF AUBURN**

By: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

Attest:

By: \_\_\_\_\_

**CITY OF BELLEVUE**

By: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

Attest:

By: \_\_\_\_\_

**CITY OF BOTHELL**

By: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

Attest:

By: \_\_\_\_\_

**CEDAR RIVER WATER AND SEWER DISTRICT**

By: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

Attest:

By: \_\_\_\_\_

Accepted:

Kitsap County Department of Emergency Management  
Kitsap County, Washington

\_\_\_\_\_  
Michael Gordon, Director  
Kitsap County Emergency Management

\_\_\_\_\_  
Date

Approved DATED this \_\_\_\_\_ day of \_\_\_\_\_  
,2015

**BOARD OF COUNTY COMMISSIONERS**  
**KITSAP COUNTY, WASHINGTON**

\_\_\_\_\_  
**ROBERT GELDER, Chair**

\_\_\_\_\_  
**EDWARD E. WOLFE, Commissioner**

\_\_\_\_\_  
**CHARLOTTE GARRIDO, Commissioner**

ATTEST:

\_\_\_\_\_  
**Clerk of the Board**

**COOPERATIVE PURCHASING AGREEMENT**

**CITY OF ISSAQUAH**

By: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

Attest:

By: \_\_\_\_\_

**CITY OF KENT**

By: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

Attest:

By: \_\_\_\_\_

**NORTHSHORE UTILITIES**

By: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

Attest:

By: \_\_\_\_\_

**CITY OF RENTON**

By: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

Attest:

By: \_\_\_\_\_

**CITY OF SAMMAMISH**

By: John Howard

Title: Acting City Manager

Date: 10/21/2015

Attest:

By: Michael Ryan

**CITY OF SEATTLE**

By: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

Attest:

By: \_\_\_\_\_

**CITY OF KIRKLAND**

By: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

Attest:

By: \_\_\_\_\_

**Exhibit A**  
**King County LiDAR Project Partners and Contract Costs**

King County Lidar Partner	Sq Mi Assigned Area	Equivalent Acres	Partner: QSI Acquisition Cost	Partner: Admin Cost 7%	Partner: QA Cost 7%	TOTAL: City/Agency Cost	TOTAL: King County Shared Cost	Total City/Agency and King County Shared Cost
Auburn	50.67	32430.76	\$12,648.00	\$885.36	\$885.36	\$14,418.72	\$13,735.27	\$28,153.99
Bellevue	50.29	32184.90	\$12,552.11	\$878.65	\$878.65	\$14,309.41	\$13,631.14	\$27,940.55
Bothell	20.48	13108.92	\$5,112.48	\$357.87	\$357.87	\$5,828.22	\$5,551.97	\$11,380.19
Cedar River Water and Sewer District	21.56	13798.65	\$5,381.47	\$376.70	\$376.70	\$6,134.88	\$5,844.09	\$11,978.97
Issaquah	18.08	11571.01	\$4,512.69	\$315.89	\$315.89	\$5,144.47	\$4,900.62	\$10,045.09
Kent	51.59	33020.58	\$12,878.02	\$901.46	\$901.46	\$14,680.95	\$13,985.07	\$28,666.02
Kirkland	26.73	17108.41	\$6,672.28	\$467.06	\$467.06	\$7,606.40	\$7,245.86	\$14,852.26
Northshore Utility District	27.77	17769.70	\$6,930.18	\$485.11	\$485.11	\$7,900.41	\$7,525.93	\$15,426.34
Renton	35.17	22509.62	\$8,778.75	\$614.51	\$614.51	\$10,007.78	\$9,533.41	\$19,541.19
Sammamish	33.58	21488.24	\$8,380.41	\$586.63	\$586.63	\$9,553.67	\$9,100.83	\$18,654.50
<b>Totals</b>	<b>\$334.94</b>	<b>\$214,990.79</b>	<b>\$83,846.39</b>	<b>\$5,869.24</b>	<b>\$5,869.24</b>	<b>\$95,584.91</b>	<b>\$91,054.19</b>	<b>\$186,639.10</b>

NOTE: King County has agreed, under a separate agreement, to pay a proportionate cost for the project as outlined in the Table above.

# COOPERATIVE PURCHASING AGREEMENT

## Exhibit B

### LiDAR Data Acquisition Cost Proposal – King County LiDAR Project

September 9, 2015

**Michael Gordon**

Kitsap County Department of Emergency Management

911 Carver St

Bremerton, WA 98312

360-307-5872

mgordon@co.kitsap.wa.us

**RE: LiDAR Data Acquisition Cost Proposal – King County 2015 Project Area, WA**

Quantum Spatial, Inc. appreciates the opportunity to present to the **Puget Sound LiDAR Consortium (PSLC)** a cost proposal for acquiring and processing high-resolution ( $> 8$  pulses/m<sup>2</sup>) LiDAR data for the project area of interest to King County, WA. Our cost for LiDAR acquisition and processing abides by our negotiated cost structure with the PSLC, assuming that a contract for standard deliverables will be administered through Kitsap County, WA.

*LiDAR point cloud colored by NAIP imagery of downtown Redmond, Washington.*



## Services

### **Airborne LiDAR**

QSI will collect LiDAR data using a Leica LiDAR system to produce a highly accurate, high resolution ( $\geq 8$  pulses/m<sup>2</sup>) LiDAR dataset with no gaps and ample buffers (at least 100m) around project boundaries. Data will be collected at a  $\leq 30^\circ$  field of view ( $\pm 15^\circ$  from nadir), with at least 50% overlap among swaths to minimize gaps and laser shadowing. The LiDAR system records up to four range measurements (returns) per pulse (first, second, third, and last). All overlapping flight lines will be flown in opposing directions to maximize detection of swath to swath inconsistencies used to resolve system misalignments. Our GPS receivers and LiDAR systems are GNSS-capable ensuring low PDOP values and adequate satellite constellations throughout the mission. GPS quality is predicted before the flight and checked during post processing to ensure that positional accuracy exceeds specifications.

Using a combination of automated and manual techniques that are tailored to the particular land cover and terrain of the study area, LiDAR processing will include kinematic corrections, calculation of laser point position, relative accuracy testing and calibrations, classification of ground and non-ground points, assessments of statistical absolute accuracy, and creation of ground surface models.

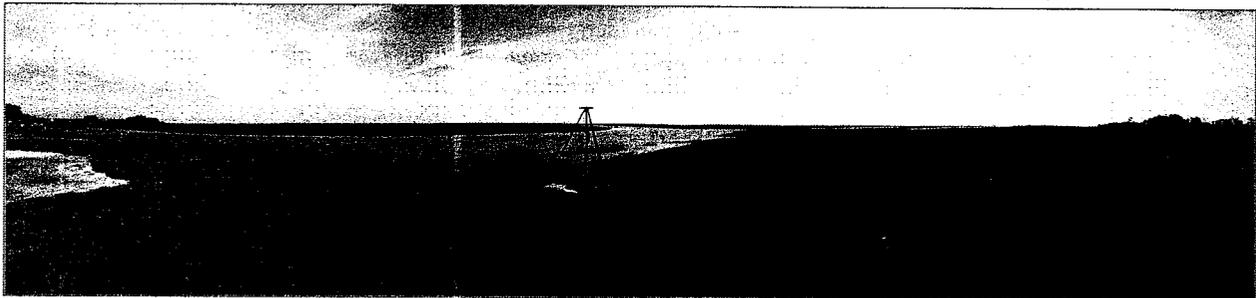
Absolute accuracy assessments will compare known RTK ground survey points to derived LiDAR points. Accuracies are described as the mean and standard deviation ( $\sigma$ ) of divergence from RTK ground survey point coordinates. All accuracy statistics (RMSE<sub>z</sub>, Accuracy<sub>z</sub> - 1.96 $\sigma$ , skewness/distribution, and percentile deviations) will be reported in the final report. Statements of statistical accuracy will apply to fixed terrestrial surfaces only.

LiDAR Specifications Summary	
Multi-Swath Pulse Density	≥ 8 pulses/m <sup>2</sup>
Scan Angle	≤30° (+/-15° from Nadir)
Returns Collected Per Laser Pulse	Up to 4
Intensity Range	1-255
Swath Overlap	50% side-lap (100% overlap)
GPS PDOP During Acquisition	≤3.0
GPS Satellite Constellation	≥6
Maximum GPS Baseline	13 nautical miles
Accuracy <sub>z</sub> (1.96 $\sigma$ ), slope <20°	≤ 20 cm
Vertical Accuracy ( $\sigma$ ), slope <20°	≤ 15 cm
Horizontal Accuracy ( $\sigma$ )	≤ 30 cm

**Survey Control**

Simultaneous to the LiDAR data collection mission, QSI will conduct a static (1 Hz recording frequency) survey of the horizontal and vertical positions of two or more survey control dual-frequency DGPS base stations established at monuments with known coordinates. Maximum baseline lengths between control points and the aircraft GPS do not exceed 24 kilometers (13 nautical miles). After the static GPS data have been collected, the files will be processed using the Online Positioning User Service (OPUS). Multiple sessions will be processed over the same monument to confirm antenna height measurements and reported OPUS position accuracy. Control monument locations will be certified by a QSI Washington PLS.

Quality control real-time kinematic (RTK) ground check survey data will be collected within the project area, with an established Root Mean Square Error (RMSE) of less than 2 cm. Absolute laser spot accuracies will be statistically analyzed based upon an adequate sample (500 per 50,000 acres, depending on access and GPS conditions within study area) of well-distributed RTK ground survey points on open, bare earth surfaces with level slope.



# COOPERATIVE PURCHASING AGREEMENT

## Deliverables

Deliverables will match standard for Puget Sound LiDAR Consortium:

LiDAR	
Report of Survey	Text report that describes survey methods; results; vendor's accuracy assessments, including internal consistency and absolute accuracy; and metadata <i>.pdf, .doc, or .odt format</i>
Aircraft trajectories (SBET files)	Aircraft position (easting, northing, elevation) and attitude (heading, pitch, roll) and GPS time recorded at regular intervals of 1 second or less. May include additional attributes. <i>ASCII text format</i>
All-return point cloud	List of all valid returns. For each return: GPS week, GPS second, easting, northing, elevation, intensity, return#, return classification. May include additional attributes. No duplicate entries. <i>ASCII text and LAS version 1.2 format</i> <i>1/100<sup>th</sup> USGS 7.5-minute quadrangle (0.75 minute by 0.75 minute) tiles</i>
Ground point list	List of X,Y,Z coordinates of all identified ground points. <i>ASCII text.</i> <i>1/100<sup>th</sup> USGS 7.5-minute quadrangle (0.75 minute by 0.75 minute) tiles</i>
Ground surface model	Raster of ground surface, interpolated via triangulated irregular network from identified ground points. No unavoidable point misclassification <i>ESRI floating point grid, 3 ft cell size, snapped to (0,0), 1/4<sup>th</sup> USGS 7.5-minute quadrangle (3.75 minute by 3.75 minute) tiles</i>
First-return (highest-hit) surface model	Raster of first-return surface, cell heights are highest recorded value within that cell, voids may be filled with ground surface model <i>ESRI floating point grid, 3 ft cell size, snapped to (0,0), 1/4<sup>th</sup> USGS 7.5-minute quadrangle (3.75 minute by 3.75 minute) tiles</i>
Intensity image	<i>GeoTIFF, 1.5. ft pixel size, 1/4<sup>th</sup> USGS 7.5-minute quadrangle (3.75 minute by 3.75 minute) tiles</i>
<p><b>Files shall conform to a consistent naming scheme. Files shall have consistent internal formats. Surface models shall have no tiling artifacts and no gaps at tile boundaries. Areas outside survey boundary shall be coded as NoData. Internal voids (e.g., open water areas, shadowed areas in first-return surface) may be coded as NoData.</b></p>	

### Coordinate System\*

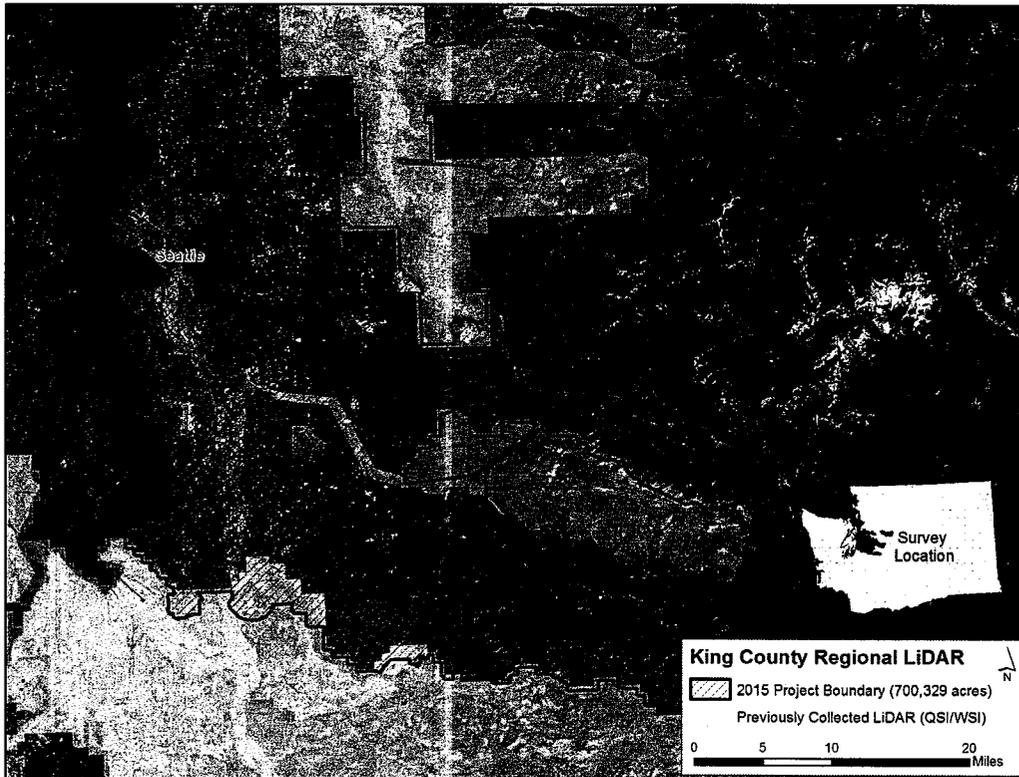
<b>Projection</b>	Washington State Plane North
<b>Horizontal Datum</b>	NAD83 (CORS96)
<b>Vertical Datum</b>	NAVD88 (GEOID03)
<b>Units</b>	U.S. Survey Feet
<b>Delineations</b>	USGS Quadrangle tiling scheme

\*To match with existing data. The data will be created in NAD83 (CORS96), but for GIS purposes will be defined as NAD83 (HARN).

## COOPERATIVE PURCHASING AGREEMENT

### Area of Interest – King County, WA

The area of interest (AOI) for this cost proposal includes 700,329 acres spread through King County, WA (Figure 1). Previous LiDAR collections for the PSLC and Pierce County are shown in grey. Overlap between collections will facilitate data matching. The AOI will be buffered by 100 meters to ensure complete coverage and adequate point densities around study area boundaries.



*Figure 1. Area of interest for LiDAR acquisition in King County, WA.*

### Schedule

QSI will work with PSLC and King County to coordinate timing of data collection during fall 2015 as best meets the needs of the project. All data are delivered to PSLC within 60 days of acquisition.

### Cost Proposal

The following table presents LiDAR acquisition and processing costs for the project area portrayed in Figure 1, assuming above specifications and deliverables. Costs for acquisition and base level processing are in accordance with QSI's negotiated area-weighted rate structure with the Puget Sound LiDAR Consortium.

King County, WA Regional LiDAR 2015 (700,329 acres)	Total Cost	Per Acre Cost
LiDAR Acquisition and Base Processing	\$546,256.62	\$0.78

\* Budget does not include 14% PSLC administrative fee.

**COOPERATIVE PURCHASING AGREEMENT**

**Exhibit C**

**Puget Sound LiDAR Consortium Rate Structure**

<b>Provider:</b>	<b>Kitsap County</b>
<b>Agreement No.:</b>	<b>KC-244-12 w/extension</b>
<b>Agreement Title:</b>	<b>Remote Watershed LiDAR Services</b>

Area Extent	Price per Acre	Price per Square Mile	Contours	Intensity Images	Gain-normalized Intensities
50 to 100 sq. miles (32,000 to 64,000 acres)	\$1.42	\$909	\$0.142	\$0	\$0.080
100 to 150 sq. miles (64,000 to 96,000 acres)	\$1.11	\$710	\$0.111	\$0	\$0.060
150 to 200 sq. miles (96,000 to 128,000 acres)	\$0.94	\$602	\$0.094	\$0	\$0.050
200 to 250 sq. miles (128,000 to 160,000 ac)	\$0.84	\$538	\$0.084	\$0	\$0.040
Greater than 250 sq. mi (Greater than 160,000 ac)	\$0.78	\$499	\$0.078	\$0	\$0.035

The Puget Sound LiDAR Consortium (PSLC) adds a 14% overhead fee to the total cost. 7% is for contract and administrative services by Kitsap County Department of Emergency Management and 7% to the Puget Sound LiDAR Consortium for Data analysis.