Statewide Low Distortion Projection Design

Request For Proposal

Iowa Department of Transportation

Introduction

The Iowa Department of Transportation’s Office of Design is interested in Geodetic Consulting services to provide Low Distortion Projection (LDP) Design and documentation for the entire state of Iowa. If your firm is interested in providing the described services, please submit a proposal stating your ability and availability to complete this work.

Project Background

The Department in association with the Society of Land Surveyors of Iowa (SLSI), the Iowa County Engineer’s Association (ICEA) and other interested organizations and agencies desire to utilize LDP coordinate systems for mapping projects.

The work will involve design of multiple coordinate systems zones that minimize linear distortion at the topographic surface (i.e., at “ground”). LDP design alternatives shall be limited to the Transverse Mercator and Lambert Conformal Conic projections, and the standard defining parameters shall achieve low distortion without any other modification of the coordinate system so that the systems are compatible with a wide range of commercial surveying, engineering, and Geographic Information System (GIS) software. The design shall include specification of the appropriate linear unit and geometric reference system (i.e., geodetic datum), based on consultation with IDOT.

Project Scope

An important aspect of the design process is that it shall be performed interactively with the LDP steering team to ensure that the final selected design for all zones satisfies the requirements of IDOT, SLSI, and their stakeholders. Although the main objective is to minimize linear distortion, another objective is to maximize the spatial extent so that the state can be covered with as few zones as possible while achieving an acceptably low distortion goal of 20 ppm and a sensible distribution of zones (e.g., contiguous areas defined by county boundaries). Therefore the design process is an optimization problem, and it is anticipated that this will require preparation and discussion of multiple alternatives for each zone. These alternatives will include consideration of distortion levels, areas of coverage, and projection types. All alternatives and final designs shall be computed on a regular grid of points completely covering the proposed zone plus a buffer of not less than 20 miles, and the grids shall be at a spatial resolution sufficient for making detailed assessments of performance (not coarser than 9 arc-seconds, or 1000 ft by 1000 ft); the required spatial resolution for the final designs is stated in the deliverables section of this Request for Proposal (RFP). The consultant must demonstrate previous experience and work examples in LDP design.
Deliverables shall consist of:

1. Esri ArcMap documents (*.mxd files) (also any other specified CADD/GIS formats required by IDOT including but not limited to Bentley .dgn) of the final LDP zone designs, including the following raster data: 1) Linear distortion for the individual LDP coordinate system zones; 2) Digital elevation model derived from the USGS National Elevation Dataset (NED) or Shuttle Radar Topography Mission (SRTM) models; 3) North American Datum of 1983 (NAD 83) ellipsoid topographic height; 4) Current NGS geoid model heights (presently GEOID09 or GEOID 2012 if considered appropriate); and 5) LDP convergence angles. The coverage area for the raster data will be centered on the design area and will completely cover the zone plus a buffer of not less than 20 miles. Raster data shall be provided in geographic coordinates at a spatial resolution of 3 arc-seconds (or finer), explicitly georeferenced to a realization of NAD 83 as determined during the design and documentation process (e.g., NAD83(2011)). The rasters shall be in Esri grid format or other Esri-compatible format (e.g., *.img, *.tif, *.jpg, *.bmp).

2. Esri ArcMap documents (*.mxd files) showing linear map projection distortion for both zones of the Iowa State Plane Coordinate System of 1983. This is to provide a basis of comparison for LDP distortion performance. Includes a distortion raster dataset for each State Plane zone per the requirements under deliverable item #1, but with an allowable spatial resolution of 9 arc-seconds.

3. LDP projection files (ESRI.prj, Intergraph .csf) for each final LDP zone.

4. One complete set of image files of the final LDP design and State Plane distortion maps in universal formats (e.g., *.pdf, *.jpg), at a scale and paper size suitable for color printing (as defined by IDOT and SLSI).

5. Documentation of the complete LDP coordinate system definition to facilitate use of the LDP in common surveying and GIS software packages. This will consist of the defining parameters and other technical characteristics of each LDP zone in a Handbook/User Guide intended to guide and support educational efforts by professional and technical organizations in the Iowa Surveying, Engineering and Geospatial user community to implement use of the Iowa LDP Coordinate Reference System. The intent is to produce a Handbook/User Guide similar to those developed by the Oregon DOT in its LDP design. http://www.oregon.gov/ODOT/HWY/GEOMETRONICS/docs/OCRS_Handbook_User_Guide.pdf

6. One complete set of scripts used to populate Oracle Spatial SRID MDSYS.SDO_COORD_REF_SYS table for each LDP zone. See http://docs.oracle.com/cd/E11882_01/appdev.112/e11830.pdf.
**Contract Information**

The Iowa DOT anticipates that the selection process will be completed by April 2013. Negotiation with the top selected firm will commence shortly thereafter. The selected consultant will provide services for up to 12 months.

The Iowa DOT anticipates that a Lump Sum Agreement will be used, however, this assumption may be reviewed at the time of contract negotiations.

**General Requirements**

The consultant and their subconsultants are required to be prequalified as defined in the Iowa DOT’s Policy and Procedure Manual, Policy No. 300.04, for the duration of the contract. Work under this contract will require prequalification in work category 313-Geodetic Surveying. Failure to remain prequalified during the contract will result in cancellation of any remaining portion of the contract. Details regarding prequalification are available at the Consultant Utilization webpage, [http://www.prof-tech-consultant.dot.state.ia.us/](http://www.prof-tech-consultant.dot.state.ia.us/).

It is the policy of the Iowa DOT that Disadvantaged Business Enterprises (DBEs) and Targeted Small Businesses (TSBs) shall have the maximum practicable opportunity to participate in the performance of Iowa DOT contracts. Funding of the work under this contract is not expected to involve federal-aid highway funds. Although a DBE / TSB goal is not established, the Department still encourages the spirit of the program to be incorporated in the proposed contract whenever possible. In the event DBE participation is required on a particular contract, the goal will be established as part of the negotiation. When a DBE goal is not established, the Iowa DOT still encourages the spirit of the program to be incorporated in the proposed contract whenever possible. A list of certified DBE firms may be found at: [http://www.dot.state.ia.us/contracts/contracts_eeoaa.htm](http://www.dot.state.ia.us/contracts/contracts_eeoaa.htm). A list of TSB firms may be found at [https://dia.iowa.gov/tsb/](https://dia.iowa.gov/tsb/).

**Selection Information**

Emphasis should be placed upon providing information concerning your proposed project approach, similar projects your firm has recently performed and the availability and qualifications of your key staff. The proposal may include additional information, as deemed appropriate, subject to the overall length restriction established in Proposal Requirements.

The response to this RFP should specifically provide the following information:

1. The firm’s knowledge of linear distortion analysis and LDP design and the approach used on previous projects. Submit three example projects that are similar in scope to the LDP analysis and design for this RFQ, complete with analysis and design documentation.
2. Identify key personnel to be assigned to the design and analysis process. Discuss their recent experience in LDP design. Indicate the percentage of time these personnel will perform analysis and LDP design.

3. State specialized experience and technical competence in the type of work required, including software and file data types to be utilized in the design process.

4. Provide past performance on contracts in terms of cost control, quality of work, and compliance with performance schedules.

5. Submit three references from similar projects, including name, phone number, and email contact information.

The selection committee will review and evaluate the proposals submitted based on the following criteria and the weighted value assigned to each. Include a detailed statement for each evaluation criteria.

1. Specialized experience and technical competence in LDP. – 30%
2. The firm’s knowledge of linear distortion analysis and LDP design and the approach used on previous projects. - 20%
3. Identify key personnel to be assigned to the design and analysis process. – 20%
4. Past performance on contracts in terms of cost control, quality of work, and compliance with performance schedules. – 15%
5. References – 15%

The selection committee does not anticipate the need for oral interviews.

Contacting any selection team member other than the RFP contact person is inappropriate.

**Proposal Requirements**

Please provide the following information in the order listed:

1. Include your firm’s approach to addressing the identified tasks, your understanding of the project’s scope, key issues and relevancy to Iowa’s transportation system. Briefly discuss similar projects the members on your team have completed in the past five years. This listing should be limited to the three most applicable projects.

2. Include the name, qualifications, experience, office address and availability of the contract manager as well as the manager in charge of each major work task. This information should include the identification of similar projects managed or participated in by this individual. The selection of a contract manager and work task managers by a firm will constitute a commitment by that firm and NO substitute managers will be allowed without prior written approval by the Iowa DOT.

3. Include experience and qualifications for any sub-consultants to be used and work they will perform.

4. Include a detailed resume, summary of current workload and a time commitment for each professional or technical person to be assigned to the project. Identify the principal or manager who will serve as the project manager.

5. A project schedule outlining the timeline and estimated completion date of each major
identifying in your scope of work. This should include a schedule with a description of all deliverable products throughout the period. A graphical representation of the proposed schedule should be included.

6. The location of the office where the majority of work will be performed.

7. A disclosure of all work for other clients that may be affected by work on the proposed contract to avoid a potential conflict of interest.

8. Include a statement that the consultant will meet the DBE goal. If the consultant cannot meet the minimum goal, include a commitment statement for the percentage of participation that they can meet.

The proposal may include additional information, as deemed appropriate, subject to the overall length restriction established in Proposal Requirements.

Cost information should not be submitted as part of the proposal.

The proposal must be submitted as a single electronic PDF and be formatted to print on 8.5” x 11” pages. The proposal must be limited to 25 single-sided pages. All pages will be counted including: proposal covers, cover letter, dividers, etc. The maximum size limit of a proposal is 7 megabytes.

On the cover page of the proposal, please include title of the RFP for which the proposal is submitted and the email address of the person who should receive the results of the selection. Inclusion of promotional literature of a general nature will not be considered in the selection process.

The electronic proposal must be submitted via email to Norm.Miller@dot.iowa.gov. An email will be sent confirming receipt of the proposal within 30 minutes or by 1:00 p.m. on the submittal deadline date, whichever is later.

For a firm to be considered, their proposal must be received by 3:00 pm on February 28, 2013.

Any technical questions or questions regarding this RFP shall be submitted via email to Norm.Miller@dot.iowa.gov. Any questions about this RFP must be received by noon on February 21, 2013. Questions and answers regarding this RFP will be posted with the RFP on the Consultant Utilization website, http://www.prof-tech-consultant.dot.state.ia.us.

Any proposal not complying with all requirements stated in the RFP may not be accepted.

**Public Records Law**

The Iowa DOT will treat all information submitted by a consultant as open records following the conclusion of the selection process. Open records are public records that are open for public examination and copying. The Iowa DOT’s release of records is governed by Iowa Code Chapter 22 and 761 IAC Chapter 4. Consultants are encouraged to familiarize themselves with these laws before submitting a proposal.
Statement of Non-Discrimination

The selection and contract are subject to the provisions of Executive Order 11246 (Affirmative Action to Insure Equal Employment Opportunity). Federal and state laws prohibit employment and/or public accommodation discrimination on the basis of age, color, creed, disability, gender identity, national origin, pregnancy, race, religion, sex, sexual orientation or veteran’s status. If you believe you have been discriminated against, please contact the Iowa Civil Rights Commission at 800-457-4416 or Iowa Department of Transportation's affirmative action officer at 515-239-1693. If you need accommodations because of a disability to access the Iowa Department of Transportation’s services, contact the agency's affirmative action officer at 800-262-0003.