City of Rapid City, South Dakota

REQUEST FOR PROPOSALS
FOR
DIGITAL GIS BASE MAP DEVELOPMENT SERVICES

Deadline:
5 copies due November 4, 2011 at 4:00 PM MDT

Correspondence Shall Be Addressed to:

Donald Jarvinen
GIS Division
300 Sixth Street
Rapid City, SD 57701
605-394-4120

Any technical questions regarding this document or processes should be directed to Angela Tallon at 605-716-3654 or angela.tallon@rcgov.org.

September 30, 2011

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INTRODUCTION

Overview

The City of Rapid City, SD is requesting proposals from professional mapping firms for Spring of 2012 leaf-off aerial flights and natural color digital orthorectified photography which will be used to create a new digital orthophoto base map for the City. Orthophotography production will use the City's existing DTM. In addition, the City requests pricing for optional planimetric mapping of building footprints within the City project area. It is the City's intention to select one successful respondent to deliver all of these services.

The City desires that the aerial photography be flown in the Spring 2012 in snow-free, leaf-off conditions. The aerial photography specifications, including scanning (if not collected digitally), should be adequate (scale, resolution, etc.) to support production of the products desired by the City under this RFP, including:

- Color digital orthophotography with an approximate 0.5 ft. ground resolution intended to be used at a scale of 1"=200' that meets National Map Accuracy Standards (NMAS) at a 1:2400 scale, and approximate 1.0 ft. ground resolution intended to be used at a scale of 1"=400' that meets NMAS at a 1:4800 scale as indicated in the areas on the map in Appendix 1. Orthophotography at these two different scales will likely require flights at two different elevations. This approach was adopted for the previous projects as a cost saving measure. The existing DTM was produced for these two scales. Respondents are invited to submit an optional proposal for completing the entire project at the 0.5 ft. ground resolution along with any additional costs.
- Digital planimetric mapping, specifically the footprints of buildings. Respondents are invited to propose options for updating the City's 2008 footprint feature class versus a completely new footprint feature class. This product constitutes Option A.
- Other products. Respondents are invited to propose other value-added products as part of the project.

Product delivery may be phased to extend into the Fall of 2012 and beyond, depending upon the requirements of the City and negotiations with the selected firm. The City will retain ownership and rights to all photographs and digital products created during the performance of this project. Responses to this RFP should include a schedule for completion of tasks in general compliance with the time line on page 5.

Background

The City of Rapid City is located in Pennington County, South Dakota, in the western part of the state. It extends into the eastern Black Hills and is roughly 55 square miles in size (see overview map in Appendix 1). The project area includes approximately 205 square miles. A shape file of the project area and tiling scheme may be downloaded from http://www.rcgov.org/GIS/rfps.html.

For the past thirteen years, the City and County governments have jointly funded a Geographic Information System. The GIS uses ESRI software, and has an enterprise license agreement

with the ESRI company. The City Engineering Division also uses AutoCAD software for in-house design projects.

Excellent survey control exists within and around Rapid City. The approximately 200 control locations may be seen in Appendix 2. Two types of control stations have been established: primary and secondary. Primary stations are surveyed using GPS to better than first order accuracy horizontally and are "bluebooked." Secondary stations are GPS surveyed to first order accuracy. Vertical accuracy for both types are 0.1 foot, plus or minus. All stations have NGVD29 datum elevations. Horizontal control uses South Dakota State Plane, south zone, feet in NAD83/96 coordinates. Given the distribution of stations, it is anticipated that sufficient points will be available as photographic panel points for the project. Respondents may download a shape file containing the control network at http://www.rcgov.org/GIS/rfps.html for use in project planning. The selected firm will coordinate panel requirements with the GIS Division. Respondents may propose the use of aircraft equipped with GPS technology in order to minimize the amount of ground control necessary to meet the defined standards for the photogrammetric and planimetric requirements of the project. The City will be responsible for providing photography panels at the selected locations.

INSTRUCTIONS TO PROPOSERS

Solicitation

The City will negotiate a professional services agreement with the successful respondent. All respondents are responsible for the costs incurred in responding to this proposal.

Submission of Proposals

It is intended that each respondent furnish all information requested in this document. Unless specifically requested, promotional literature is not desired and will not be considered to meet any of the requirements.

Each respondent shall be required to include the following items in their proposal. These items should be used as the format around which the proposal is organized. Exclusion of any of these items could be grounds for proposal rejection by the City.

1. Transmittal Letter. A letter of transmittal, not to exceed two pages in length, which bears the signature of an authorized representative of the respondent and designates by name not more than two individuals authorized to negotiate and sign an agreement with the City on behalf of the respondent.

2. Organizational Description. A description of your organization, including qualifications addressing your organization's capability to provide the services requested. This must also include a description of subcontractors and associations with other firms you wish to utilize in the performance of the tasks, including the intended working relationships and responsibilities of each. Also include a description of your understanding of the City's needs in the proposed project and your staffing commitments to assure your ability to meet the City's time frame. Please describe past client projects you have completed that are similar in nature to that proposed in this document.

3. Product Procedures. Describe how you will produce each of the products requested in this RFP. This must include the methods used and the quality control/quality assurance procedures that will be observed. The minimum data product specifications described under each work component must be met. Subcontractors or other firms that will work on any part of the project must also be identified, including the general nature and scope of work that will be undertaken by these firms, along with each firm's work location. The vendor shall retain full responsibility for all work completed or uncompleted by any subcontractor.

4. Mobilization. Describe the plan for mobilization of aerial resources including the location from which the resources will be staged and the flight time to the project area. If the aerial collection firm is not part of the proposing firm, this information should be included in the proposal.

5. Project Schedule. Include a schedule for completing the work specified in this request, including a progress reporting strategy.

6. City Obligations. Provide a list of all items to be provided by the City to assist you in completing the requested work. This should include any data (i.e. existing control, etc.) and/or proposed use of staff, office space, and any equipment or materials/supplies that will be expected from the City. This component should also describe a strategy for project management indicating the mechanisms intended to be used to coordinate the proposed work with the City.

7. Product Example. Provide an example digital orthophoto image file and example planimetric data set(s) from similar work completed by your organization. The orthophoto image should be delivered in a TIF file format accompanied by an ESRI standard world header file (*.tfw) for viewing in ArcGIS. The planimetric data set(s) should be delivered in ArcGIS feature class format as part of a personal or file geodatabase. Example data should be submitted on a CD-ROM. *Only one copy of the example data sets is necessary.*

8. References. Each proposal must provide the name, address and phone number for five (5) individuals from organizations that have procured similar services to act as references for the respondent. The individuals identified must at least hold a position of project management or other contract authority.

9. Pricing Information. A separate price for each project component shall be submitted with the proposal. The contract amount should take into consideration the fact that the City is exempt from all state taxation, including state sales tax. Any increase in the price once the proposal has been submitted will invalidate the proposal and result in the disqualification of the respondent from consideration for the project. *Please note that the optional project component requested may not be pursued or may be limited in scope depending upon availability of funds*.

One (1) original and four (4) copies of the proposal document should be submitted in one sealed envelope. The Proposer's response should contain only the information requested and be limited to approximately 20 pages in length. All cost proposals shall be valid for a period of not less than ninety (90) days from the date of receipt. Articles should be submitted to the following address by the proposal receipt date and time specified:

Attention: Donald Jarvinen
GIS Division
300 Sixth Street
Rapid City, SD 57701

Respondent proposals shall be received no later than 4:00 P.M., MDT, on November 4, 2011.

Clarification and/or revisions to the specifications and requirements.

Respondents are expected to raise any questions, exceptions, or additions they have concerning the RFP document. If a respondent discovers any significant ambiguity, error, conflict, discrepancy, omission, or other deficiency in this RFP, they should immediately contact the individual named on the first page of this document of such error and request modification or clarification of the RFP document.

In the event that it becomes necessary to provide additional clarifying data or information, or to revise any part of this RFP, revisions/amendments and/or supplements will be posted to the City web site on the GIS RFP page at http://www.rcgov.org/GIS/rfps.html. It is the responsibility of the respondent to check the web page for change documents.

Questions and/or clarifications will be accepted by the City until November 4, 2011, at 4:00 p.m. MDT.

Time Line

The proposed schedule for digital the GIS base map development process is as follows:

11/04/11	Proposals due
11/10/11	Short-list firm interviews (if necessary) and selection of successful firm
11/23/11	Contract due from selected firm
March-April 2012	Paneling of identified ground control points
April-May 2012	Aerial photography acquisition
Sept 2012	Delivery of orthophotos
Nov 2012	Delivery of planinmetric data

The above dates are subject to change at the option of the City.

Basis of Award

The award resulting from this request for services will be made to one firm submitting a response that best serves the needs of the City. Proposals will be evaluated on criteria that include:

- The extent that proposed approach to services meets the City's needs.
- Demonstrated competence to meet quality requirements based on QA/QC procedures and overall approach to project management.
- Proven experience of the firm to provide similar products to similar clients, including recommendations from those clients, and/or previous experience with the City.

- Ability to deliver products within proposed time frame.
- Costs of services/products. The City will consider its costs for providing additional control points that are not in the existing network if a respondent requires such points.

This list of criteria is meant for informational purposes only. The City of Rapid City reserves the right to make its selection on any subjective criteria it deems appropriate.

A short list of firms will be developed from a review of written responses. These firms may be required to make a presentation by phone to supplement their proposals if requested by the City. The City will make every reasonable attempt to schedule presentation times convenient for the short-listed respondents. Failure of a respondent to conduct a requested presentation to the City on the date scheduled may result in rejection of their proposal.

The City reserves the right to reject any and all proposals and to negotiate the terms of the contract, including the award amount, with one or more, or none of the respondents prior to entering into a contract. Omissions, alterations, or irregularities of any kind shall constitute sufficient cause for rejection of a proposal. However, the City reserves the right to waive irregularities in the proposals. The City reserves the right to advertise for new proposals if, in its judgment, the best interest of the City will be served. Non-disclosure cannot be guaranteed after the selection stage of this procurement due to public record laws.

Ownership of Completed Products

All maps, photographs, documents, reports or digital data prepared or completed during the performance of services specified in this RFP shall become the property of the City and shall not be copyrighted by the proposer. Also, the same materials shall not be released or made available to any third party or used for other purposes at any time without the written approval of the City.

SCOPE OF WORK

Project Components

The proposed GIS Base Map Development project involves three separate, but related, components:

1. Aerial photography acquisition for the City area;
2. Digital orthophoto production;
3. Digital building footprint feature compilation (Option A).

A description of each task including minimum specifications is provided below to help guide firms in the formulation of responses to this RFP.

Respondents are invited to recommend any alternative approaches to photography, scanning, and/or rectification that will result in a better product and/or cost savings to the City.

Respondents are also invited to recommend any alternative approaches to planimetric feature compilation that should be considered by the City with respect to level of detail, attribution, etc.

Component 1 - Aerial photography acquisition

The City desires to obtain full color aerial photography in the Spring of 2012 to support development of large-scale digital orthophotography and planimetric mapping in the City area. Respondents are asked to propose an approach to the photography acquisition that will best meet these and other needs of the City.

The proposed approach to aerial photography acquisition for the City area should outline the respondent's intended flight plan including date and time of photography, flight height and negative scale, flight lines, endlap and sidelap, planned aerial equipment and materials, and relevant quality control procedures.

Digital aerial imaging methods may be used instead of film aerial photography.

Specifications

Specifications associated with this work component will follow those of the "Aerial Photography Specifications" produced by the American Society of Photogrammetry and Remote Sensing (ASPRS). In addition:

- Photographic coverage for the City area will be for approximately 205 square miles of land. Developed areas adjacent to the City were flown in the previous project at a different height to accommodate a lesser resolution of data as a cost saving measure. The geographic area of interest with the two different data resolutions is depicted in Appendix 1. The City intends to maintain the two resolution scheme to reduce costs, but respondents are invited to submit proposals with an optional price for completing the entire City area project at the 0.5 ft. pixel resolution scale. Respondents may download a shape file containing the data grid at http://www.rcgov.org/GIS/rfps.html for use in project planning.
- The color aerial photography may be captured using either a traditional film based aerial camera or by using a digital aerial camera. If captured with a traditional film based aerial camera, the film frame shall capture natural color. If captured with a digital aerial camera, the digital frame shall capture natural color, but may additionally and optionally capture other light bands such as, but not necessarily limited to, near infrared (NIR).
- Respondents should identify ground control needed to support the photography. Any points in addition to the existing city control points must be clearly identified in the proposal, as this will raise the total cost of the project to the City. Respondents that require additional points are invited to include the cost of placing and surveying those points as an option in the price proposal. Any additional points should be placed on public land or in the public right of way. Land ownership information is available online at www.rapidmap.org.
- The City will be responsible for paneling all needed ground control.
- Photography shall not be acquired when the ground is obscured by haze, snow, smoke, dust, flood waters, or environmental factors that may obscure ground detail. Photography with cloud coverage of any amount of thin cirrus, thin cirrostratus,

and/or thin altostratus clouds is acceptable as long as sufficient light is available to produce the shadows and contrast necessary for good quality aerial photographs. Clouds and/or shadows of clouds shall not appear in the photographs. The solar altitude should not be less than 30 degrees when aerial negatives are exposed. Photography will be collected in snow-free, leaf-off conditions.

- Unacceptable aerial photography shall be re-flown at the earliest opportunity, weather permitting, by the vendor at no additional cost to the City, with the re-flight coverage overlapping the accepted photography by at least two stereo models.

Component 2 - Digital orthophoto production

The second work component involves production of digital orthophotography from the aerial photography work in Component 1. Respondents should present a strategy for creating and delivering digital orthophoto images that 1) meet NMAS for an approximate 0.5 ft. ground resolution and that are intended to be used at a scale of 1"=200', and 2) meet NMAS for an approximate 1.0 ft. ground resolution and that are intended to be used at a scale of 1"=400' for the areas indicated on the map in Appendix 1. Final images are expected to meet National Map Accuracy Standards for maps at 1:2400 scale and 1:4800 scale. The City's existing digital terrain model will be used for completion of the work of this component as a cost-saving measure. The successful respondent will be given the digital terrain model data compiled as part of a project completed for the City in 2008. It is available in ArcGIS feature class format with feature classes of breaklines and mass points for both the 1"=200' area and the 1"=400' area.

Specifications

- Images are to be geo-referenced to the South Dakota State Plane Coordinate System (South Zone) based on the NAD83/96 adjusted horizontal and NGVD29 vertical data.

- Individual digital images will be edgematched with no pixel gaps or overlaps between geographic partitions.

- If film photographic methods are used, all digital imagery is to be generated by scanning aerial photographs and processing the data within a digital environment. Scanned conventional hardcopy orthophotos will not be acceptable.

- Color and density matching of digital ortho images will be controlled to create the appearance of a seamless mosaic. Respondents are expected to identify the quality assurance and checking procedures that will be employed to guarantee proper tone balancing and overall image quality.

- Digital images will be delivered in a standard TIFF file format with accompanying geo-reference header files (.tfw) that are appropriate for use within the City's ArcGIS and AutoCad software environments.

- Digital images will be delivered as individual files utilizing the tiling scheme supplied by the City (see Appendix 1). Individual files will use the exact same pixel

resolution and be cut exactly at the tile boundary to facilitate loading them into a mosaic in an ArcGIS SDE geodatabase.

Deliverables

- Digital images in .tif files with .tfw header files.
- Digital terrain model (DTM) used in the orthophoto rectification and data development processes, if the model has been updated.
- FGDC-compliant metadata for the orthophotos.

Component 3 - Digital planimetric feature compilation - building footprints (Option A)

The third work component involves digital compilation and delivery of select planimetric features within the City project area which will include the footprints for buildings.

Respondents are asked to propose an approach to the planimetric compilation that ensures a product derived from aerial photography that meets National Map Accuracy Standards for scales of 1"=200' and 1"=400'. Respondents should address planned quality control practices to ensure compilation completeness and topological consistency. Respondents may either produce a new footprint feature class or update the feature class from the 2008 project.

Specifications

- The feature class will be geo-referenced to the South Dakota State Plane Coordinate System (South Zone) based on the NAD83/96 adjusted horizontal and NGVD29 vertical data. The City will supply the spatial reference and the database schema for the feature class, or the existing feature class if the respondent chooses to update it rather than creating an entirely new feature class.
- The building feature class has attributes for the average height of the roof, the building type (commercial or non-commercial), and date of edit. The selected respondent will be responsible for entering the average height of the roof and the edit date for each polygon.
- Polygons will be topologically clean.
- The minimum size of buildings to be digitized will be 10 feet by 10 feet.

Deliverables

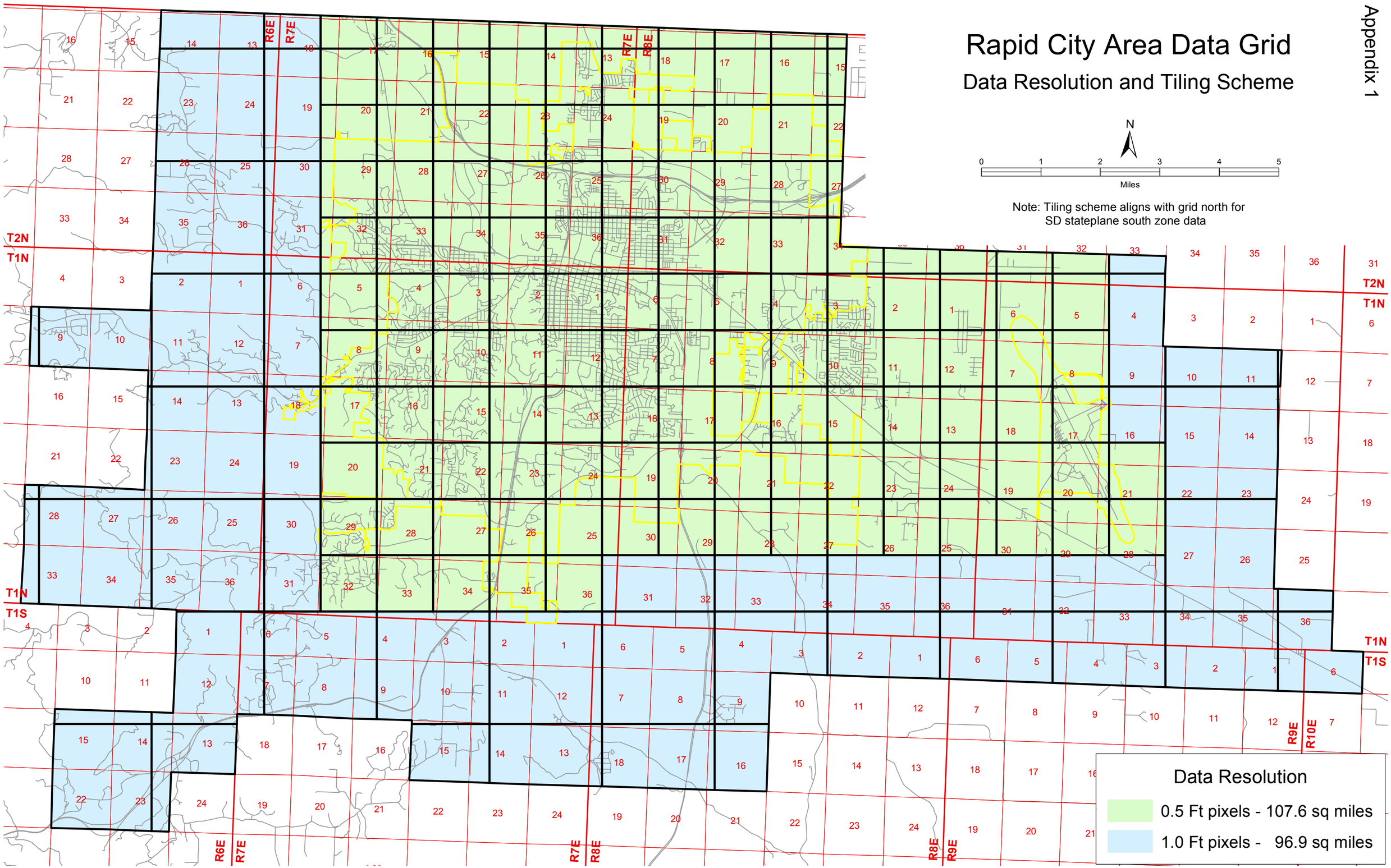
- A polygon building footprint feature class in a project-wide ArcGIS personal or file geodatabase.
- FGDC-compliant metadata for the building footprint feature class.

Appendix 1

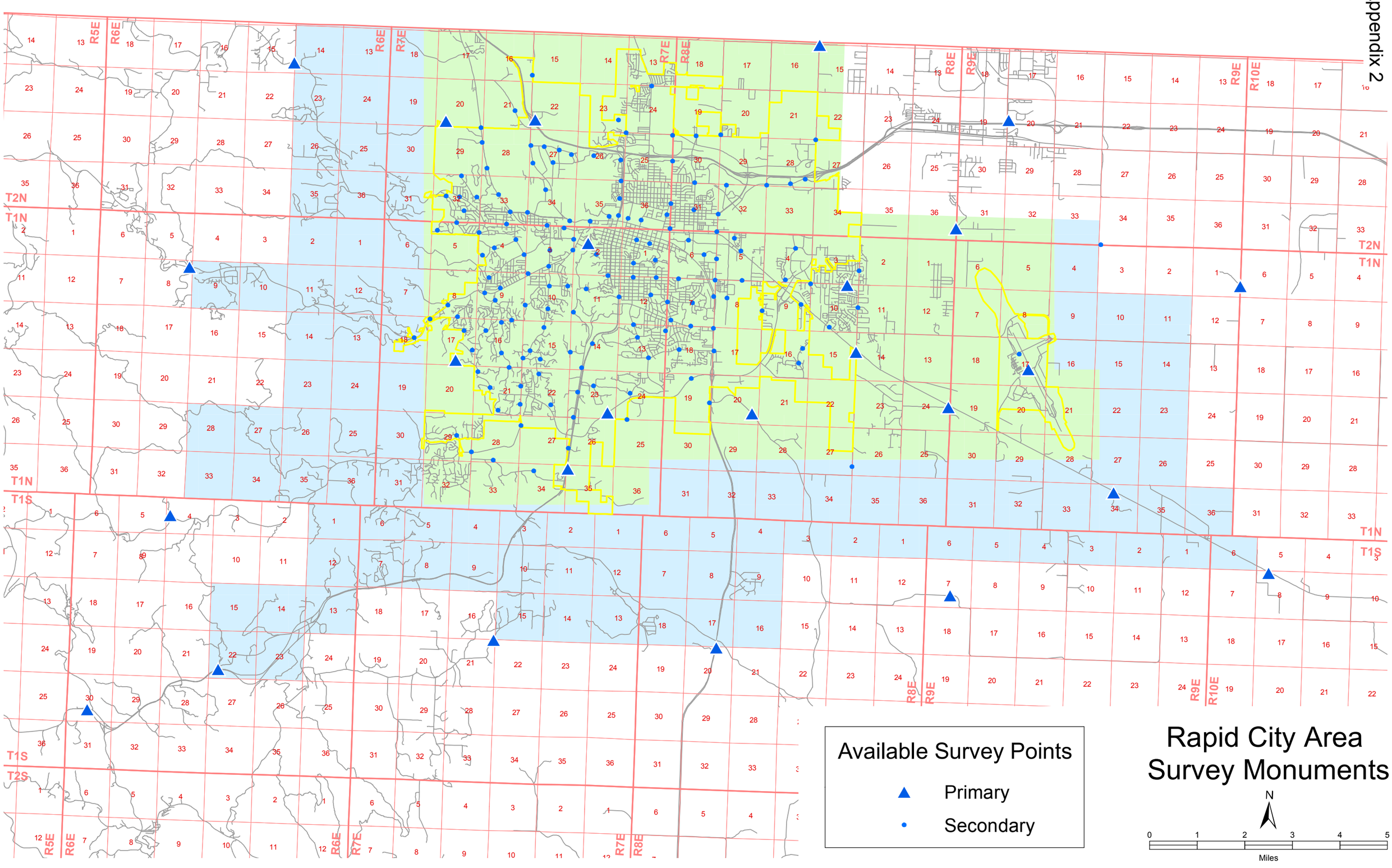
Rapid City Area Data Grid

Data Resolution and Tiling Scheme

Note: Tiling scheme aligns with grid north for SD stateplane south zone data



Appendix 2


R5E
R6E
R7E
R8E
R9E
R10E
T2N
T1N
T1S
T2S
Available Survey Points
Primary
Secondary
Rapid City Area
Survey Monuments
N
0
1
2
3
4
5
Miles