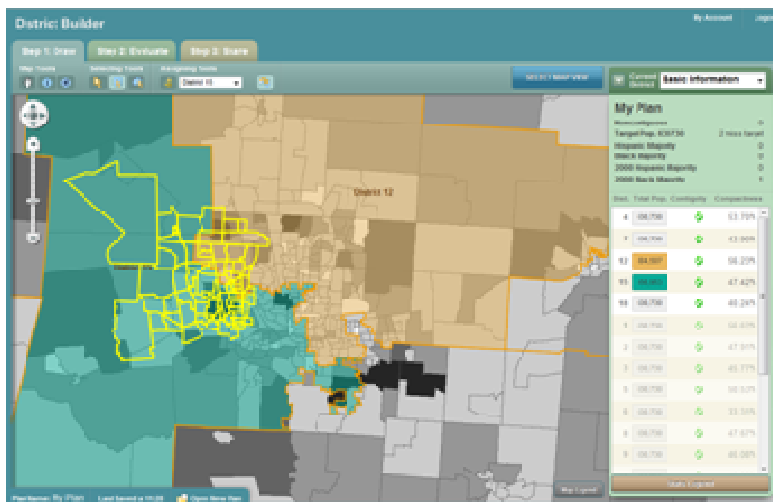




# State of Arizona Arizona Independent Redistricting Commission State Redistricting Mapping Services

Solicitation Number: ADSP011-0000704



Submitted by:



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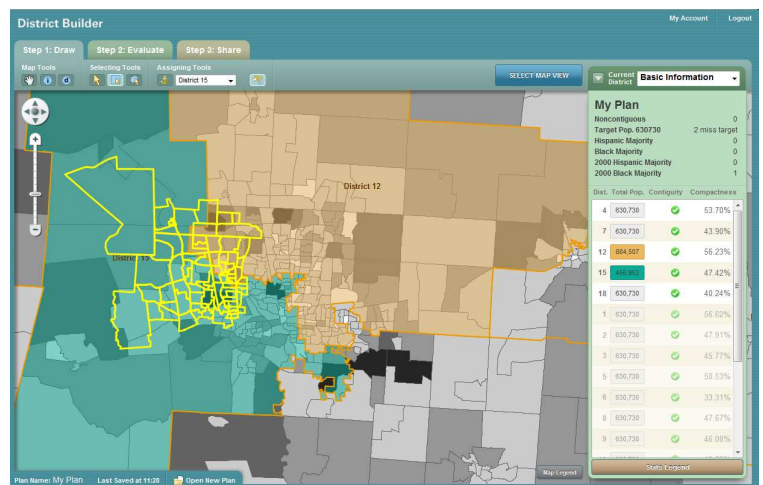
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## Executive Summary

The mission of the Arizona Independent Redistricting Commission (AIRC) is to administer the fair and balanced redistricting of the Congressional and legislative districts for the State of Arizona. A five-member commission consisting of two Democrats, two Republicans and one Independent will redraw the district lines based on Census 2010 data, applicable legislation and public input from local citizens. The goal is to create compact and contiguous districts that are very nearly equal in population that respect communities of interest, respect existing political and census boundaries and visible geographic features, and are competitive in nature.

Azavea's response focuses on two parts of the RFP: the assembly of a redistricting database; and provisioning of redistricting software, but this response is partial and Azavea does not propose services for all portions of the RFP.

The Azavea team includes Michael McDonald, professor at George Mason University and one of the preeminent national experts on redistricting as well as Azavea's software team. For the software Azavea proposes an implementation of District Builder, an **open source web-based redistricting software application** developed in collaboration with George Mason University with funding from the Alfred P. Sloan



Foundation, the Joyce Foundation and the Christopher Newport University Education Foundation. The software is designed to be deployed at low cost and adapted to the legal context of a particular jurisdiction.

District Builder has already been used by the **Arizona Competitive Districts Coalition** to provide an **online redistricting tool** that enables citizens to play a role in the redistricting process by creating and publishing their own redistricting plans. A series of viable district plans resulting from this competition are being provided to the Arizona Independent Redistricting Commission as an important indicator of public input.

A similar implementation will be deployed for the AIRC that will incorporate both public-facing and internal administrator features that will be important to the Arizona redistricting process. District Builder offers many features that will be important to the Arizona process:

- **Intuitive user interface** that requires minimal training and no GIS skills in order to master
- **Support for Census 2010** redistricting data as well as local boundary layers and election results
- The ability to support **thousands of registered users** as they create, save and share redistricting plans and maps of their communities of interest
- **Real-time calculation** of demographics, compactness and contiguity for each proposed district
- Generate **reports of the number of districts splits** of any geography, including user-generated communities of interest.
- A **flexible and configurable design** that can be adapted to meet Arizona redistricting legal requirements

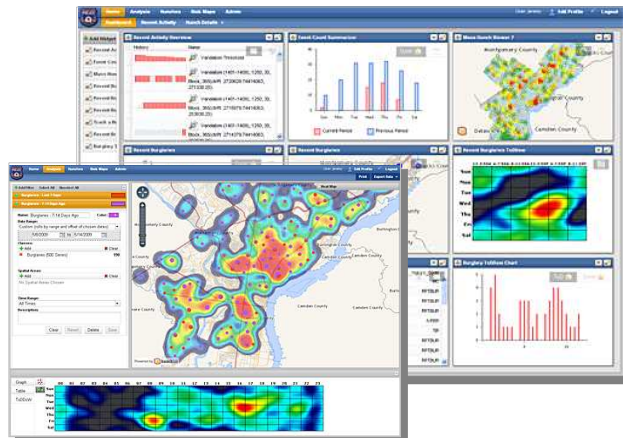
- **Map editing tools familiar to users** that have experience with widely-used web mapping interfaces like Google Maps or Bing Maps
- Software architecture **reviewed for security** by a computer security expert
- **Open source** software that is transparent and available for review
- **Browser-based** solution that does not require any plugins or installation by users
- **No licensing fees** or additional hardware or software purchases are required

Azavea has many years of experience supporting elections and political data analysis projects at the local, state and national levels. We are large enough to have significant design and development skills, yet small enough to provide high quality customer service and a quick response time that will meet the needs of the Arizona Independent Redistricting Commission as further outlined in this proposal.

## Company Background

Azavea is an award-winning GIS software design and development company based on Philadelphia with significant experience with elections and political data analysis. The firm was organized in 2000 to create technologically advanced solutions for web-based geospatial visualization and analysis. In 2009 Azavea deepened its commitment to a “triple-bottom-line” by becoming a [certified B Corporation](#). Azavea provides a range of services including:

- Web and mobile software development
- Spatial analysis, mapping and geoprocessing
- Spatial data mining and modeling
- High performance computing
- User Interface design
- Research and development



The firm has designed and developed geographic data applications for a variety of domains including: elections, economic development, cultural resources, land records, crime analysis, water resources and land conservation.

### User Experience Design

Azavea takes great pride in the development of user interfaces that are simple, easy-to-use and are crafted for the specific purpose at hand. Our talented developers and designers work with each client to develop applications that aren't simply functional, they are simple and beautiful.

### Commitment to Community

Azavea is committed to working on projects with a strong social value component in order to promote the emergence of more dynamic, vibrant, and sustainable communities. Each of Azavea's projects, products and pro bono engagements showcases this commitment.

## Azavea R&D

Azavea has an active research and development program through which the firm invests substantial resources toward the development of new solutions and techniques. Each employee is encouraged to develop a personal research project that will both engage the employee and extend the capabilities of the organization. Current research projects related to the humanities include: smart phone applications; cloud computing; creating tools for assessing walkability; and development of an historic geocoder that can support mapping of historic addresses. While not all of these research projects results in measurable commercial success, they are an important part of a culture at Azavea that encourages and takes pride in innovative applications of geospatial technology.

## Technology and Partners



Azavea's developers work with a broad range of tools and have particularly strong backgrounds with the .Net, Java, Python and Adobe Flex frameworks. Azavea is an Esri Business Partner and has several years of experience with development and deployment on the ArcGIS platform with dozens of applications implemented on the ArcGIS Server, ArcGIS.com and ArcIMS products. Azavea was named ESRI Business Partner-of-the-Year or Foundation Partner-of-the-Year in 2006, 2007 and 2010. In addition, Azavea is a Microsoft business partner with substantial experience developing the .Net Framework, SQL Server and Windows Server platforms.

In addition to commercial toolkits, Azavea staff is experienced creating web software that use online API's such as GoogleMaps, Bing Maps, ArcGIS.com and OpenStreetMap. The firm also works with a range of open source tools that accelerate and lower the cost of our software development work. In particular, Azavea has a great deal of experience with creating solutions that bring together the strengths of both commercial and open source toolkits to create high quality and visually attractive applications. The firm not only has experience with open source solutions, but also contributes to them, including the OpenLayers, PostGIS, FastDAO, DistrictBuilder and SourceMap projects.

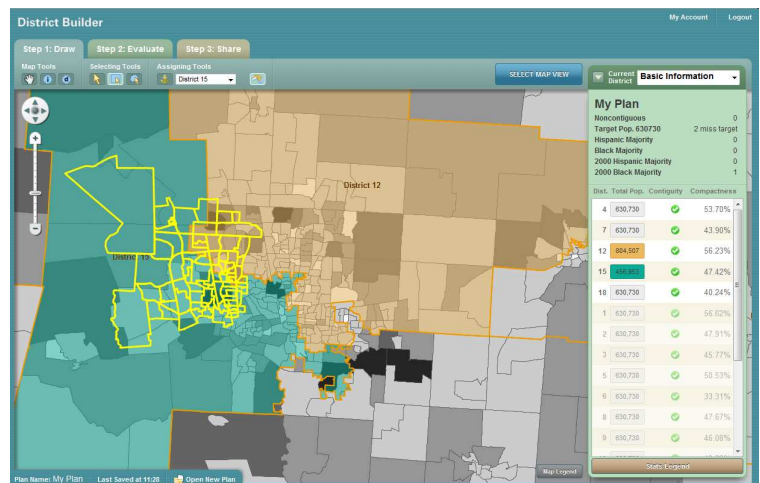
## Elections and Politics

Azavea has done a significant amount of work supporting elections and political data analysis.

### District Builder:

<http://www.publicmapping.org/>

District Builder is a web-based redistricting software application developed in collaboration with George Mason University with funding from the Alfred P. Sloan Foundation, the Joyce Foundation and the Christopher Newport University Education Foundation. The software is an open source

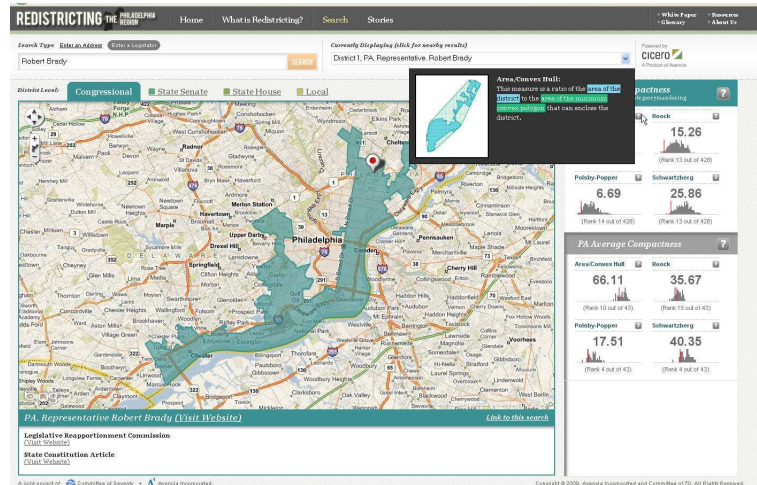


solution designed to be deployed at low cost and adapted to both the legal context and geography of a particular jurisdiction. Azavea has adapted this for use at the municipal and county level and provides services for configuring, installing and supporting the application.

**Redistricting The Nation:**

<http://www.redistrictingthenation.com>

As part of an update to our 2006 Gerrymandering White Paper, Azavea developed a national scale web site and new data sets that enable the public to find their national, state and local districts, generate compactness metrics and learn about the redistricting process. The application has been enormously successful and has been referenced by news media, academic organizations and citizen activists.



**Cicero API:**

<http://www.azavea.com/cicero/>

Azavea’s team of geographers and software developers created the Cicero web API, the most comprehensive geographic database for data on elections, elected legislators and legislative district maps. Cicero quickly and accurately matches citizens with their representatives based on an address or intersection. Organizations can integrate the Cicero web API into existing web applications or data management software and provide their stakeholders with legislative data for the United States, Canada, Australia, New Zealand, the United Kingdom and Ireland.

US 340 N 12th St Philadelphia PA 19107 SEARCH

Local elected officials

DISTRICT NAME	REPRESENTATIVE NAME
District 1	Council Member Frank DiCicco
AT LARGE	City Controller, Philadelphia Alan Butkowitz
AT LARGE	City Commissioner, Philadelphia Anthony Clark
AT LARGE	City Commissioner, Philadelphia Joseph Duda
AT LARGE	Council Member W. Goode
AT LARGE	Council Member Bill Green
AT LARGE	Council Member William Greenlee
AT LARGE	Council Member Jack Kelly
AT LARGE	Council Member James Kenney
AT LARGE	Council Member Blondell Reynolds Brown
AT LARGE	Council Member Frank Rizzo
AT LARGE	City Commissioner, Philadelphia Margaret Tart...
AT LARGE	District Attorney, Philadelphia R. Seth Willi...
PHILADELPHIA	Mayor Michael Nutter

State elected officials

DISTRICT NAME	REPRESENTATIVE NAME
District 175	Representative Michael O'Brien
District 1	Senator Lawrence Farnese
PA	Attorney General, PA VACANT VACANT
PA	State Treasurer, PA Rob McCord
PA	Lieutenant Governor, PA Jim Cawley
PA	Governor Tom Corbett
PA	Auditor General, PA Jack Wagner
PA	Lieutenant Governor, PA Jim Cawley

National elected officials

DISTRICT NAME	REPRESENTATIVE NAME
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District 1 Philadelphia, PA, US

Council Member Frank DiCicco

Primary Address:  
City Hall  
Room 332  
Philadelphia, PA, 19107-3290

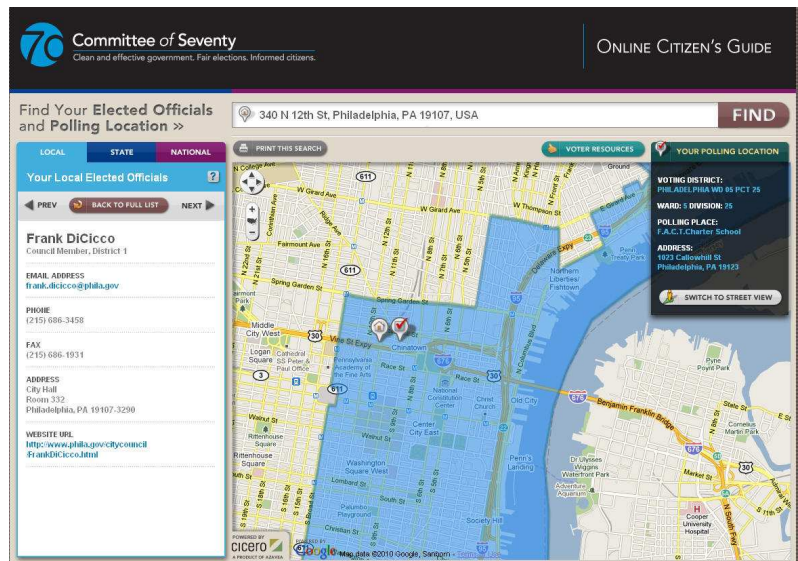
Phone: (215) 686-3458 Fax: (215) 686-1931

Email: [frank.dicicco@phila.gov](mailto:frank.dicicco@phila.gov)

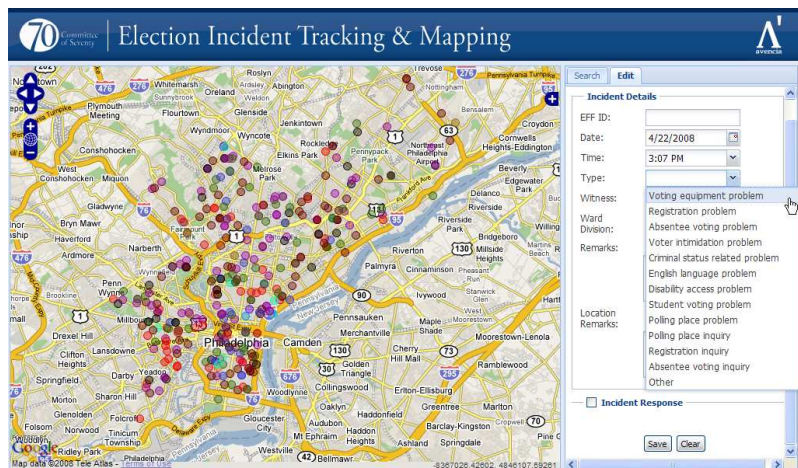
Web Site: <http://www.phila.gov/citycouncil/Fra...>

**Online Citizens Guide:**

<http://guide.seventy.org/> Using the Cicero API, Azavea developed an online Citizen's Guide for the Committee of 70, an election and campaign reform organization based in Philadelphia. The Citizen's Guide enables the public to find polling places as well as contact information for their elected representatives and ward leaders.

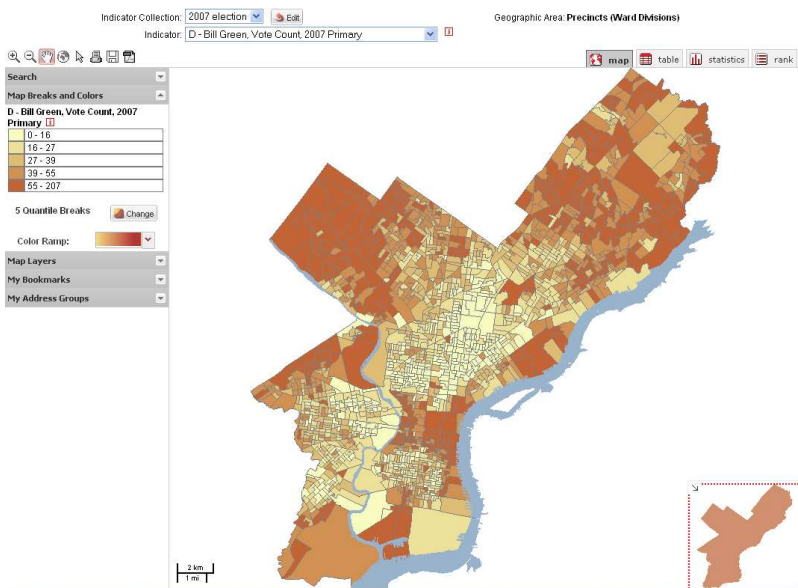


**Election Day Voter Protection:** Azavea works with election watchdog organizations to set up election incident monitoring and reporting tools. The software we have developed enables incidents to be entered, modified, mapped and visualized in order to assess where investigation and documentation teams should be dispatched.



**Election Results Publishing:**

Azavea has developed election results analysis tools that enable the public to visualize and interact with election results data through maps, tables, graphs and reports.



## Staff Capabilities

Azavea organizes its staff into teams that focus on a particular set of capabilities. These teams share common coding approaches but have experience solving particular problems. For this project, we have proposed our District Builder Team, who will be complemented by other staff members as needed. Azavea's District Builder Team is made up of three software engineers, a project manager and a project director with extensive experience developing web-based redistricting applications for municipal, county and State clients:

- Robert Cheetham, Project Director
- Abigail Fretz, Project Manager
- David Zwarg, Lead Software Developer
- Andrew Jennings, Software Developer
- Kenneth Shepard, Software Developer
- Brian Jacobs, Web Designer

Our District Builder Team recently worked with the **Arizona Competitive Districts Coalition** to provide an **online redistricting tool** that enables citizens to play a role in the redistricting process by creating and publishing their own redistricting plans. A series of viable district plans resulting from this competition are being provided to the Arizona Independent Redistricting Commission as an important means of public input. Azavea will build on this experience to provide a redistricting tool for the AIRC that will combine public and government input to create final redistricting plans for Congressional and legislative districts throughout Arizona.

In addition to Azavea staff, we have included a subject matter expert that has a significant background in redistricting work and has led the development of both the District Builder application and previous open source redistricting projects.

**Dr. Michael McDonald** is non-resident senior fellow at the Brookings Institution and Associate Professor in the Department of Public and International Affairs at George Mason University. In addition to leading the United States Elections Project and the Public Mapping project, he has worked as a redistricting consultant in seven states including: Alaska, Arizona, California, Michigan, New Jersey, New York and Virginia and is an expert in United States redistricting policies.

Resumes for the Key Personnel that will serve in the management and decision-making roles proposed for this project are provided in the Appendices. For additional information about any of Azavea's staff, their qualifications and their accomplishments, please visit our staff profile page on the web at:

<http://www.azavea.com/about-us/staff-profiles/>.

## Understanding of Requirements

Azavea's team is offering services to address two major components of the RFP: providing data preparation services and providing software for the purposes of redistricting by the commission. In addition, Azavea is prepared to support public engagements with the process by providing an implementation of the software accessible to the general public with the ability for Arizona citizens to develop and submit their own plans.

### 1. Response to Statement of Work

*2.5.1 Assemble a redistricting database utilizing certified population data from the 2010 US Census for the State of Arizona and voter registration information from the Arizona Secretary of State or as directed by the AIRC.*

*2.5.1.1 The consultant shall be responsible for any verification that is necessary to ensure the accuracy of the census data, as well as, verifying that the election data is complete and advising the Commission if it is not.*

*2.2.6 To the extent practicable, competitive districts should be favored where to do so would create no significant detriment to the other goals.*

**Azavea Response:** Dr. Michael P. McDonald, an expert in redistricting law and voter data (and principal on the District Builder software development project), will provide services to develop the database based on certified population data from the US Census Bureau. Dr. McDonald will identify and integrate appropriate historic voter history datasets to be used in determining metrics for measuring district competitiveness. As required, he will integrate requesting US Census Bureau and voting datasets to be used in racial bloc voting analyses to ensure compliance with the Voting Rights Act.

We assume that these 2010 US Census data to which the RFP referred are the PL94-171 redistricting data produced by the Census Bureau.

We note that in preparing a similar redistricting database of merged census and election data for the Arizona Competitive Districts Coalition in support of their redistricting competition that we discovered a number of errors in the PL94-171 voting tabulation district identifiers, what the Census Bureau generically calls voting precincts. These errors occurred primarily in Maricopa County. We obtained from the Maricopa County and other election officials the necessary data to resolve these issues. Since this work must stand above reproach in the event of court action, we assume that we will conduct another verification of these data.

As a consultant to the AIRC in 2001, Dr. McDonald applied accepted political science methods to determine if a district is competitive, per the state constitutional requirement. This work was successfully defended in subsequent litigation, *Minority Coalition for Fair Redistricting, et al. v. Arizona Independent Redistricting Commission*.

As part of the District Builder team, Dr. McDonald proposes to conduct this analysis, modifying it to address lessons learned from the last redistricting cycle. The analysis requires devising an underlying measure of partisan strength, which is used to determine the competitive character of a district. This is done by associating the measure of partisan strength to legislative election results, to ascertain when a district falls within the competitive range of the partisanship measure.

In 2001, Dr. McDonald used partisan voter registration statistics to devise the measure of partisan strength. We recommend against using partisan voter registration statistics, as the litigation revealed how administration of voter registration records provided a measure of district partisanship that could be questioned in court. Instead, we recommend that the AIRC use an average of statewide partisan races to measure district partisanship. Statistical analyses will be performed to select the best combination of statewide races and to determine the appropriate range for a competitiveness measure.

Last decade Dr. McDonald was required to conduct individual analyses for each plan the AIRC wished to be tested with a competitiveness analysis. This time, we propose to directly integrate the calculations into the redistricting software. This will enable automatic generation of reports, and thus provide a cost saving to the AIRC.

We note that the standard political science statistical competitiveness analyses requires the identification of incumbents running in legislative elections. The courts ruled in *Minority Coalition for Fair Redistricting, et al. v. Arizona Independent Redistricting Commission* that this information was common public knowledge, was not specific location of homes, and did therefore not conflict with the Arizona constitution.

*2.5.2 Provide all necessary computerized equipment to house and utilize the redistricting database.*

*2.5.3 Use GIS software and the redistricting database to display mapping configurations of census units and proposed election districts in relation to federal and State-mandated requirements.*

**Azavea Response:** Azavea will provide all hardware, software and related support services necessary to develop and host the web-based District Builder solution proposed for this project, but this equipment will be housed in a remote data center and will not be delivered on-site to the Arizona Independent Redistricting Commission. These services will include provisioning three servers using, installing GeoServer, PostgreSQL, Python, Django and other necessary components, installing and configuring the District Builder application, and providing daily database back-ups.

Azavea has hosted several instances of the District Builder software at both the state and local level, including an instance for the **Arizona Competitive Districts Coalition**. Azavea will utilize an external data center hosting the application with Linode. The application will be hosted on at least three servers, each with up to 8GB of RAM and multiple processor cores. The servers will be separated into separate functional units, include a mapping server, a report generation server and an application server in order to maximize the scalability of the system. Pingdom or similar service will be used to monitor application health in order to ensure maximum uptime.

*2.5.4 Provide drafts of maps for the congressional and State legislative districts in a timely fashion as directed by the AIRC. Time is of the essence in the preparation of these maps, and a schedule of delivery shall be included in any response to this Solicitation. The AIRC shall review the draft maps and direct changes as necessary.*

*2.5.5 Assist the AIRC in certifying to the Secretary of State the establishment of congressional and State legislative districts.*

**Azavea Response:** Azavea will not provide these services. AIRC will have the opportunity to develop its own draft redistricting plans using the District Builder application, potentially in conjunction with a second consultant to this project.

*2.5.6 Provide training to the AIRC in utilizing the database and mapping software throughout the term of any resultant contract.*

**Azavea Response:** Azavea has provided two options for training, including on-site training in Arizona for members of the AIRC staff and optional webinar training over the internet for AIRC staff and/or members of the general public in groups of up to 100 per session. On-site training would be provided in two sessions over a two-day period. Webinar training is one to two hours in length and can be provided on multiple dates and times.

*2.5.7 Develop a PowerPoint® presentation to be used by the AIRC's commissioners, staff or designees to provide public information to community groups. The presentation shall include background information on the initiative and an overview of the project scope as well as how to provide input to the AIRC on the redistricting plans.*

**Azavea Response:** Azavea will not provide the powerpoint development services or be directly involved in public meetings or similar outreach projects. However, Azavea will provide a public-facing version of the District Builder software as well as a Powerpoint® presentation about the public mapping software and how it can be used.

Dr. McDonald will prepare reports and a Powerpoint® presentation regarding database construction and competitiveness analysis, as required.

*2.5.8 Provide all equipment necessary to draw maps reflecting the stated concerns and interests of the public participants.*

**Azavea Response:** Azavea will not provide any on-site hardware or software to the Arizona Independent Redistricting Commission, but will instead provide all hardware, software and related support services necessary to develop and host the web-based District Builder solution proposed for this project, as further outlined in 2.5.2, above. The District Builder application has been designed from the ground up as an internet-based solution that can be simultaneously used by many people, each of whom may have their own redistricting plans. The software will be configured to comply with Arizona's specific set of legal requirements for creating and verifying a legal redistricting plan, allowing both the Arizona Independent Redistricting Commission and members of the public to create, edit and store valid city council district plans. Both public-facing redistricting implementation and an implementation specific to AIRC members will be provided.

*2.5.9 Support the AIRC in holding a number of public meetings, as directed by the AIRC, throughout the State to discuss proposed redistricting plans. The Contractor shall be responsible for compiling and soliciting public input as well as providing the public with information as directed by the AIRC, including such items as draft maps and other relevant information.*

*2.5.10 Provide a process to enable the public to provide input to the mapping process.*

**Azavea Response:** Azavea will not be involved in public meetings or similar outreach projects except through provision of the public-facing District Builder website. District Builder provides public participation support through a user friendly, browser-based interface that does not require GIS knowledge or particular skills to navigate. Users create and edit district plans in an easy-to-use map interface using map editing tools that were designed to be easy to learn and familiar to users who have experience with widely-used, web-based mapping interfaces like Google Maps or Bing Maps.

*2.5.11 Develop coding of maps submitted by the public or developed during public hearings to describe stated concerns and interests of the public participants.*

*2.5.12 Provide coding of public testimony such that it can be indexed, aggregated and collated to corresponding maps.*

**Azavea Response:** As outlined in Task 7 of Azavea's work plan, Azavea will provide an ability to export publicly submitted redistricting plans from District Builder in shapefile or block equivalency files in CSV format for archiving purposes at the end of the project timeframe. This will not include any maps developed during public hearings unless done so using the public-facing version of the District Builder application.

*2.5.13 Assist the State in submitting the redistricting plan to the United States Department of Justice or the United States District Court.*

**Azavea Response:** Azavea will provide exports of redistricting plans by developed by both the public and the AIRC as shapefile or block equivalency files in CSV format. Azavea can provide additional formatting as necessary based on specifications provided by the State, but we have not included additional tasks for this activity in the budget.

*2.5.14 Assist the AIRC and the AIRC's legal counsel in complying with the Voting Rights Act of 1965, as amended.*

**Azavea Response:** Azavea will provide an ability to export publicly submitted redistricting plans from District Builder in shapefile or block equivalency files in CSV format format at the end of the project to assist with documentation of compliance.

*2.5.15 Ensure an ongoing interaction between the Contractor, the AIRC and the AIRC staff.*

**Azavea Response:** Azavea will ensure ongoing interaction between AIRC and its staff, as well as with any other contractors selected for this project. Interaction will be facilitated through e-mails, telephone calls, and/or remote meeting methods.

*2.5.16 Provide all equipment required to produce, digitally store, project on screen (for audience viewing), and print all maps desired by the AIRC.*

**Azavea Response:** Azavea will not provide any on-site hardware or software to the Arizona Independent Redistricting Commission, but will instead provide all hardware, software and related support services necessary to develop and host the web-based District Builder solution proposed for this project for both internal and public access, as further outlined in 2.5.2, above. District Builder users are able to use the standard screen print function to capture portions or the entirety of their map and paste the map into the software of their choice (Microsoft Word, Photoshop, etc.) to facilitate presentation and printing. However, no projection equipment or printing equipment or printing services will be provided.

*2.5.17 Develop archival level research materials as directed by the AIRC and deliver these to the AIRC at scheduled times to allow for the archive of this process to be timely and orderly. The term "archival" shall refer to both electronic and paper documents and other such medium as may be deemed applicable. It is the intent of the AIRC that all of the public data that is collected shall be available electronically for the benefit of both the current and future Independent Redistricting Commissions as well as the general public.*

**Azavea Response:** Azavea will provide an ability to export publicly submitted redistricting plans from District Builder in shapefile or block equivalency files in CSV format for archiving purposes at the end of the project. We have budgeted for this task in our proposed work plan.

*2.6 Expedited work schedule is a priority. The Contractor shall draft a proposed time line detailing a suggested schedule for the AIRC to follow, and it will be the responsibility of the Contractor to maintain this schedule.*

**Azavea Response:** Azavea will work with the AIRC and other contractors on this project to establish a proposed timeline and schedule for the work proposed. Following completion of the work outlined in 2.5.1, above, Azavea can implement the proposed District Builder instance in approximately ten business days.

*2.7 The AIRC's staff and the Contractor will work as directed by the AIRC to expeditiously develop and make accessible and interlinked websites, social media and other such open and accessible internet communications data as may be deemed appropriate to maximize the opportunity for public input and access to the activities and actions of the AIRC. These sites may include audio, video, podcast, Skype and other such links as to not limit the AIRC's goal for data and input collection.*

**Azavea Response:** The District Builder application has been designed as an internet-based solution that can be simultaneously used by many people, both internally at AIRC and through a public-facing website. We have designed the user interface to be equally as simple and useful for experienced redistricting administrators and public users of the software in order to maximize the opportunity for public input and access. Under the webinar-based training option, Azavea can also record the training session and provide this as a video for use by AIRC. However, District Builder does not provide additional audio, video, podcast or Skype features.

*2.8 The software employed by the Contractor must automatically display the results of any proposed change in a district by retabulating and presenting on-screen the resulting map and the corresponding changes in total population and population sub-groups associated with the proposed change to a district.*

**Azavea Response:** The District Builder plan statistics panel illustrates both plan summary and individual district statistics in a simple tabular format. As a user edits their plan the statistics panel updates in real time, illustrating to the user how their most recent edits have affected the underlying demographic and election data associated with each district.

*2.9 Contractor shall be required to maintain an ongoing log for each map documenting the basis on which decisions were made and how the AIRC complied with the applicable requirements of the Arizona Constitution and the Voting Rights Act. The log will be subject to regular review and approval by the AIRC and shall include documentation and indexing of all key decisions.*

**Azavea Response:** Azavea is not proposing to provide actual maps for the Commission, so will not provide a log for this process.

*2.10 The AIRC must be provided unfettered access to draft maps, logs, reports and the supporting documentation and data and may, in its sole discretion, obtain independent evaluations of such materials.*

**Azavea Response:** Azavea is not proposing to provide actual maps for the Commission, so will not provide draft maps, logs or reports, but Azavea will provide activity logs and other materials related to public use of District Builder.

*2.11 Contractor shall be required to develop work plans in collaboration with AIRC with deliverables and timelines as specified by the AIRC.*

**Azavea Response:** Azavea has included a work plan with deliverables and timelines in this proposal.

*2.12 Contractor shall provide progress reports on an "as needed" basis as determined by the AIRC and/or its Executive Director. Any request for a written or verbal report must be addressed within 24 hours.*

**Azavea Response:** Azavea will provide progress reports within twenty-four business hours of any request.

*2.13 Contractor shall work in collaboration with and at the direction of the AIRC during all public input hearings. AIRC staff and Contractor will jointly facilitate interaction with the public.*

**Azavea Response:** Azavea will not be involved in public meetings or similar outreach projects except through provision of the public-facing District Builder website. Azavea will provide application support and updates to facilitate District Builder's availability and interaction with the public.

*2.14 Contractor must provide information security measures consistent with industry standards in project critical areas including but not limited to data transmission, monitoring, verification, storage, back-up and confidentiality.*

**Azavea Response:** District Builder supports Secure Sockets Layer (SSL) for encrypting user account information. The software's architecture has been reviewed for security by an expert in computer security, Dr. Micah Altman, during the design and development and continues to be reviewed on an ongoing basis.

*2.15 All Contractor personnel who will provide services for the resultant contract and the services each will perform must be specified in the Offeror's response. If personnel offered by the selected Contractor leave the Contractor's firm during the contract term or are otherwise unable to participate in providing contract services, they must be replaced with comparably qualified personnel who meet the minimum qualifications as stated in this Solicitation. All replacement personnel are subject to approval by the AIRC.*

**Azavea Response:** A list of personnel has been provided in this proposal. Should the list change for any reason during the course of the project, Azavea will inform AIRC accordingly.

*2.16 At the sole discretion of the AIRC, the Contractor may be required to provide consultative assistance in the event any legal action arises relating to redistricting plans developed with Contractor's assistance. Contractor shall provide technical support for any lawsuits relating to services provided under the contract in State and federal court as deemed necessary by the AIRC.*

**Azavea Response:** With the exception of the provision of capabilities to export publicly submitted redistricting plans from the District Builder database at the end of the project, Azavea does not provide these services.

*2.17 Offerors shall disclose to AIRC in their proposal the following information for the Contractor and for all key staff members for the ten-year period preceding the offer: political affiliation, political activity or services performed, whether voluntary or for a fee, for a political candidate, as an officer of a political committee, or as a campaign worker or fundraiser; services performed, whether voluntary or for a fee, as a lobbyist or consultant for any political party, interest group or other entity that has donated money to, or raised money for, or provided in-kind support for, a candidate for public office or taken a public position on a ballot initiative or sought to influence the redistricting process; the date, nature and amount of political contributions; and the date, source, nature, amount of any donations or other funding from any source whether in cash or in kind used to support the operations of the Contractor or its key staff.*

**Azavea Response:** This information has been provided for the Key Personnel who will be involved in the day-to-day decision-making process regarding implementation of the District Builder application. Please see Attachment 6 for each individual so named.

*2.18 Offerors shall have no personal, family, or financial relationships or commitments that a reasonable person would consider likely to improperly influence someone making a redistricting decision.*

**Azavea Response:** Neither Azavea nor its staff have any such relationships or commitments.

*3.1 At its discretion, the AIRC may require additional census, voting and/or elections information to be integrated into the redistricting database for analysis as necessary to accomplish the mission of the AIRC. Such sources of information may include the Department of Justice's tabulation of American Community Survey's data regarding citizen voting-age population by race and ethnicity, as well as, precinct-level election data from the past decade that is available from the Arizona Secretary of State. Precinct-level data is available on the Secretary of State's website ([www.azsos.gov/election/PreviousYears.htm](http://www.azsos.gov/election/PreviousYears.htm)). Estimated costs for these items are to be provided as separate line items on the Attachment "3" - Pricing.*

**Azavea Response:** We noted in the original RFP issues by the AIRC that a potentially important census data product was not requested, a special tabulation requested by The Department of Justice of citizen voting-age population by race and ethnicity drawn from the 2005-2009 American Community Survey's (ACS) five-year estimates. Many legal professionals deem these data to be critical to assess compliance with Section 5 and Section 2 of the Voting Rights Act. Dr. McDonald has testified to the Nevada state legislature and provided pro-bono consulting to the Democratic National Committee regarding the integration of these ACS data with the 2010 census data. He is familiar with the issues involved and will perform this task as required.

Redistricting experts often use statewide elections to assess districts' political composition, which can be used to determine the competitive nature of districts, as required by the Arizona constitution. To support the Arizona Competitive Districts Coalition, Dr. McDonald compiled a redistricting database that includes Arizona 2008 and 2010 statewide general elections – obtained from the Secretary of State's website – integrated with the 2010 U.S. census. These statewide contests should be sufficient to assess districts' competitiveness.

Racial block voting analyses often are performed on "endemic" elections – electoral contests for the legislative body in question – and other federal, state, and local electoral contests that potentially illuminate patterns of racial voting. Additional federal, state and local 2008 and 2010 general elections are available in the precinct

level datasets obtained from the Secretary of State's website and can be integrated with the redistricting database as required. Often, racial bloc voting analyses include elections that span the previous decade.

As mentioned above, in compiling the database to support the Arizona Competitive Districts Coalition, Dr. McDonald identified some precinct identifiers were inconsistent with the census identifiers. Fortunately, these discrepancies were easily resolved by obtaining the correct boundaries from local election officials. Dr. McDonald has not verified the prevalence of similar issues prior to the 2008 general election or for 2008 and 2010 primary elections. These issues often arise when voting precincts are split or consolidated. Substantially more work may be involved to integrate these elections if precinct boundaries have changed and are not consistent with the data previously collected to support the Arizona Competitive Districts Coalition mapping.

## **2. Proposed Work Plan Tasks – Data Preparation**

### **Task 1: Database Development and Loading**

#### **Task 1A: Prepare PL 94-171 Redistricting Data for Integration into Software**

Our subject matter expert, Dr. Michael P. McDonald, an expert in redistricting law and voter data, will assemble the PL 94-171 data for loading into the District Builder instance.

#### **Task 1B: Prepare Documentation of Data Elements**

Dr. McDonald will prepare documentation of all data elements developed for the redistricting effort.

#### **Task 1C: Integrate Voter Registration Data with Census Data**

Dr. McDonald will integrate the Census 2010 data with the voter registration data and additional boundary data layers specific to the State of Arizona. Task 1C assumes election data described in Item 2.5.1 in the RFP is in a format that can be integrated with the census data in a reasonable amount of time. As a component of this task, Dr. McDonald will verify the election data are in a format that can be integrated with the census data.

#### **Task 1D (Optional): Add Citizen Voting Age Population by Race and Ethnicity Data**

Dr. McDonald will prepare a Department of Justice special tabulation of American Community Survey citizen voting-age population estimates by race and ethnicity.

#### **Task 1E (Optional): Integrate Election Data with Census Data**

Azavea assumes that the election data provided by the Arizona Secretary of State will be in a format that can be integrated with the census data in a reasonable time. We caution that there are a number of unknown components to this task that may affect the required effort and associated costs, and we reserve the right to revise our estimate accordingly based on these variables.

### **Task 1F (Optional): Integrate 2008 and 2010 Statewide Election Data with Census Data**

Dr. McDonald assumes that the election data provided by the Arizona Secretary of State will be in a format that can be integrated with the census data in a reasonable time. We estimate ten (10) hours of labor is required to integrate into the redistricting database ten (10) 2008 or 2010 general election contests identified by the AIRC. We caution that there are a number of unknown components to this task that may affect the required effort and associated costs, and we reserve the right to revise our estimate accordingly based on these variables.

## **Task 2: Competitive Districts Analysis**

### **Task 2A: Statistical Modeling**

The analysis requires devising an underlying measure of partisan strength, which is used to determine the competitive character of a district. This is done by associating the measure of partisan strength to legislative election results, to ascertain when a district falls within the competitive range of the partisanship measure. Partisan registration data can be used for this purpose, however, Dr. McDonald recommends that the AIRC use an average of statewide partisan races to measure district partisanship. Statistical analyses will be employed to select the best combination of statewide races and to determine the appropriate range for a competitiveness measure.

### **Task 2B: Testing and Verification of Model Integration into Software**

The District Builder team will directly integrate the calculations from Task 2A into the redistricting software. The methodology will be tested and verified prior to software installation and configuration.

### **Task 2C: Prepare Report**

Last decade Dr. McDonald was required to conduct individual analyses for each plan the AIRC wished to be tested with a competitiveness analysis. This time, we propose to directly integrate the calculations into the redistricting software. This will enable rapid generation of reports, and thus provide a cost saving to the AIRC.

### **Task 2D: Prepare Presentation**

Dr. McDonald will prepare a presentation outlining competitiveness results and present the work to the AIRC. All associated travel costs will be billed as a pass-through expense with no mark-up.

## **2. Proposed Work Plan Tasks – Software**

### **Task 3: Software Installation and Configuration**

Azavea will configure the following options in the software based on input from AIRC:

- Provision three Linux servers using Azavea’s virtual machine infrastructure.
- Install GeoServer, PostgreSQL, Python, Django and other necessary components
- Install the District Builder application
- Load data developed under Tasks 1 and 2
- Configure the software to meet Arizona Independent Redistricting Commission’s preferences and legal redistricting criteria set forth by the State of Arizona:
  - Base maps (Bing Maps, Esri ArcGIS.com, GoogleMaps, OpenStreetMap and other base maps are supported)

- Optional reference layers – Arizona legislative and Congressional boundaries to be supplemented by city, town, county and census tract boundaries, as outlined in the RFP.
- Legal boundary rules
- Reporting options
- Integrate Dr. McDonald’s competitive analysis
- Database Backup – Azavea will establish a daily backup of the PostgreSQL database. The resulting backup file will be removed to a separate location from the application servers in order to support a recovery scenario. This will be scheduled to run late at night in order to minimize downtime.

#### **Task 4: Graphic Design**

Azavea will develop and implement a graphic design based on branding elements of the Arizona Independent Redistricting Commission and/or State of Arizona web site(s) based on AIRC input.

#### **Task 5: Application Support and Updates**

Azavea will continue to support the application after deployment with the following activities:

- Install bug fixes as necessary to support critical problems that prevent usage by end users of the software (see Support section for more detail).
- Fixes and updates will be performed in a manner that will preserve the data in the database.

#### **Task 6: Database Export**

At the conclusion of the redistricting effort, Azavea will export the results and provide the data to the Arizona Independent Redistricting Commission and/or its designee for archiving purposes.

#### **Task 7: Project Management**

This budget item and task includes activity that is not task specific but is necessary to complete the project, including responding to e-mails, attending conference calls, preparing project status reports, and other activities.

#### **Task 8: Hosting Services**

In order to ensure the maximum possible up-time of the application, Azavea will utilize an external data center hosting the application with Linode. The application will be hosted on at least three servers, each with up to 8GB of RAM and multiple processor cores. The servers will be separated into separate functional units, include a mapping server, a report generation server and an application server in order to maximize the scalability of the system. Should additional capacity be required, Azavea will stage a fourth optional server to accommodate user traffic. Azavea will provide hosting infrastructure services to include the following:

- Electrical power
- Network bandwidth
- Disk storage
- Three virtual servers (with an option for a fourth)
- Pingdom or similar service to monitor the application

## Task 9: Training Services

Azavea has offered two training options, including on-site training in Arizona for members of the AIRC staff and optional webinar training over the internet in order to conserve travel costs.

- On-site Training -- 2 days, includes travel and sessions led by an Azavea staff person
- Webinar Training -- 1-2 hours, up to 100 people can attend each session (includes recorded copy for individuals unable to attend the training session)

Webinar training sessions can be provided for AIRC staff or as a separate option for the general public.

## Additional Assumptions

The budget and services outlined herein are based on the following assumptions:

- Azavea is proposing District Builder as a web-based tool that can be used by the Arizona Independent Redistricting Commission to perform redistricting services in-house and potentially share the process with Arizona citizens. The public will have the option of creating their own redistricting plans and submitting them to the AIRC for consideration.
- Azavea's support for the redistricting process will be limited to ensuring that the District Builder application is functioning properly, troubleshooting and answering questions about usage of the software. Azavea will not provide or otherwise comment on any potential redistricting plans.
- Any additional data that is not part of the 2010 Census population and demographic data will be provided by the Arizona Independent Redistricting Commission with a unique block identifier that relates it to the Census 2010 blocks.

# Cost and Timeline

## 1. Project Costs by Task

We have included District Builder hosting and support services budget for six months, but this can be extended on a monthly basis indefinitely. Additional support services beyond the six months may be invoiced on either a fixed monthly fee or on a time and materials basis.

Task	Commercial Pricing	Govt/Academic /Nonprofit Discount	AIRC Discounted Cost
Task 1A: Prepare PL 94-171 Redistricting Data	\$ 556	\$ (56)	\$ 500
Task 1B: Documentation of Data Elements	2,778	(278)	2,500
Task 1C: Integrate Voter Registration Data	5,556	(556)	5,000
Task 1D (Optional): Add Voting Age Population	5,556	(556)	5,000
Task 1E (Optional): Integrate Election/Census Data*	11,111	(1,111)	10,000
Task 1F (Optional): Integrate 2008 and 2010 Statewide Election Data with Census Data*	2,778	(278)	2,500
Task 2A: Statistical Modeling	11,111	(1,111)	10,000
Task 2B: Testing and Verification	556	(56)	500
Task 2C: Prepare Report	2,778	(278)	2,500
Task 2D: Prepare Presentation	2,222	(222)	2,000

<b>Database Development Labor Subtotal</b>	<b>45,002</b>	<b>(4,502)</b>	<b>40,500</b>
Task 3: Software Installation and Configuration	19,520	(1,952)	17,568
Task 4: Graphic Design	8,829	(883)	7,946
Task 5: Application Support and Updates	27,131	(2,713)	24,418
Task 6: Database Export	3,056	(306)	2,750
Task 7: Project Management	6,656	(666)	5,990
<b>Software Labor Subtotal</b>	<b>65,192</b>	<b>(6,520)</b>	<b>58,672</b>
<b>TOTAL LABOR COST</b>	<b>110,194</b>	<b>(11,022)</b>	<b>99,172</b>
Task 8: Hosting Services (3 servers, \$600 ea/mo)			10,800
<b>TOTAL COST W/ HOSTING</b>			<b>\$ 109,972</b>
Task 9A: Training – Webinar – per session			850
<b>TOTAL COST W/ HOSTING, WEBINAR TRAINING</b>			<b>\$ 110,822</b>
Task 9B: Training – On-Site, 2 sessions, 2 days			10,900
<b>TOTAL COST W/ HOSTING, ON-SITE TRAINING</b>			<b>\$ 120,872</b>

\* Costs provided for these tasks are provisional in nature and may be subject to revision.

## 2. Project Timeline

Task	1	2	3	4	5	6	7
Task 1A: Prepare PL 94-171 Redistricting Data							
Task 1B: Documentation of Data Elements							
Task 1C: Integrate Voter Registration Data							
Task 1D (Optional): Add Voting Age Population							
Task 1E (Optional): Integrate Election and Census Data							
Task 2A: Statistical Modeling							
Task 2B: Testing and Verification							
Task 2C: Prepare Report							
Task 2D: Prepare Presentation							
Task 3: Software Installation and Configuration							
Task 4: Graphic Design							
Task 5: Application Support and Updates							
Task 6: Database Export							
Task 7: Project Management							
Task 8: Hosting Services							
Task 9: Training							