**2016 URISA ESIG Award Application**
Pitkin Maps & More

**A. System**
1. **Name of the system and ESIG category for which you are applying.**
   Pitkin Maps & More – Single Process Systems
   [www.pitkinmapsandmore.com](www.pitkinmapsandmore.com) – to access the site

2. **A letter from the executive administrator authorizing submission of the system application.**
   See **Attachment A.**

3. **One (1) page, or less, summary of what the system accomplishes and why it is exemplary.**

   Pitkin Maps & More is a self-serve GIS portal to get map tools and data to citizens so they can do what they need, when they need it, simply and for no cost. Citizens can access the easy-to-use and fast site to create mailing lists, print a map, download data, create property reports, utilize robust search tools, and interact with map tools for measuring and marking up the map.

   Many local and county governments have implemented "do-it-yourself" mapping portals where citizens can create maps and download data. Pitkin Maps & More is admirable because we built our system based on customer needs as we did our best to understand their past requests, current requirements and challenges prior to project initiation. The goal was to provide a system that satisfied 90% of customer requests.

   We had a baseline of staff time and GIS customer orders going back 15 years, two internal GIS needs assessments, and a recent external GIS customer survey (with 81 respondents). With this extensive user background, behavior and needs data, we were able to combine what was desired and what was requested into the GIS products offered by our new system. This included an analysis of the past four years of sales so we knew most common services, requested data, map layers, and file formats that would satisfy the majority of customer requests. We also collected relevant feedback about the limitations and challenges of the previous GISMO web mapping site.

   Pitkin Maps & More is designed to get technical information in a non-technical fashion. Reports and maps are created by initiative wizards where end users can easily understand what is being asked and can retrace their steps. Each site function is completed in six steps or less and most of them take less than a minute to process.

   All products generated in the system have understandable file names including the create date and geographic location. Notations on the Mailing Lists, Property Report and Print a Map function are useful for proof of notification requirements and sharing this information with other parties so they can easily recognize the origin of the document and its currency.

   The products are defined to reduce errors and confusion. The default search distance of Mailing Lists coincides with the County's 300' notification requirements, however other search distances are allowed for customers with other needs. Mailing lists are pre-formatted to print on sticky address labels. Most non-technical end users don't know how to take raw data and

create a mailing list, so by providing a PDF, formatted to Avery 5130 labels, with instructions on how to print to the labels, we have anticipated how the end user will interact with the data. I have seen several other GIS sites where users can download the mailing list info in .CSV or .DBF format, but that leaves the end-user needed to process the files in a mail merge program. We also offer an XLS of the mailing list information with three additional fields for users who want to interact with the source data fields.

Most individuals that work with GIS data understand their data. As organizations distribute their data to wider audiences, the attributes are not always understandable to the end user. We spent several hundred hours changing layer names, field names, data types, adding field alias and populating metadata in our production SDE database so the data is as clean, stable and comprehensible as possible at the source. We don't want to change these items later nor do we want to spend a lot of time explaining what fields mean. By making these changes at the source this information updates "downstream" data and services though exporting, replication, and publication.

4. **Three "user testimonials".**
   See **Attachment B**.

## B. Jurisdiction Information

Pitkin County, Colorado
Population: 17,379 – including Aspen, Town of Snowmass Village and Town of Basalt
2016 Total Budget for Pitkin County: $104,142,980.

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## C. System Design
### 1. What motivated the system development?

County GIS staff was spending approximately 1,400 hours annually fulfilling GIS data and mapping requests from the public and internal staff. This was a significant amount of time where the same processes were repeating manually over and over again.

It was apparent that most of requests could be provided in a self-serve environment where this information would reach a wider audience and reduce staff resources handling these requests.

2. **What specific service or services was the system intended to improve?**
   Eight functions were identified that would meet 90% of our customer requests. The specific services follow:

   - **Robust searching -** There are two powerful search options for users to quickly zoom to an area of interest on the map. The "I Want To" menu has a "Go To" option that provides a list of options to search for a property owner, address, mining claim name, special district, condo, or subdivision. As you type, matching text is displayed, so you can narrow down your search to a direct match. The global search in the upper right corner allows free text searches. Enter a parcel identification number, owner name, address and the results will appear in an interactive table.
   - **Mailing Lists** – Mailing lists contain property owner name and mailing address information and are used for legal notification of land use requirements, special event notices, construction impact areas, homeowner association notification, and many other uses. Choose from nine search options (address, owner name, subdivision, caucus area, or draw an area on the map) to create a PDF file formatted to print on sticky labels. A XLS file with additional information (site address, account number and parcel ID) can also be downloaded.
   - **Property Report** - Choose any property in the County and get a detailed report including nearby public amenities (trails, parks, and open space), voter districts, boundaries (zone district, caucus area, master plan area, etc.), school and fire districts, general property information such as address, account number, previous years taxes and jurisdiction. There are currently 30 reported items.
   - **Print A Map** – Choose from predefined themes, including Vicinity Map, Street Map, Planning Map and Property Map, or choose from over 50 layers to create your own map. Road features, property boundaries, contours, town boundaries, federal lands, open space, water features, address labels, are just some of the layers users can interact with. The Base Map can be changed from the current 2014 Pitkin County aerial photo, to a current world satellite image, or a topographic base map. There are several options to print the map at different page sizes, map scales and print quality resolution. Print A Map creates a PDF to download to your computer.
   - **Clip N Ship** – For mapping professionals who need DWG, shapefile or geodatabase data, users choose an area on the map, select the data layers and export format, and within 15 minutes a zip file containing the data will be available to download via an email link.
   - **Data Downloads** – Countywide datasets including contours, property lines, road features, and aerial imagery can be downloaded in a variety of CKAN supported export formats including DWG, shapefile and geodatabase files. Images are provided as georeferenced TIFFs.
   - **Map Tools** - Measure area and distances, get latitude and longitude coordinates, add text and markup graphics to a map.
   - **Map Browse** – Users can access over 50 GIS datasets, but get to them through eight logical categories, so as not to be overwhelming. Users can select from map themes that

automatically turn on related layers (Planning Maps, Street Maps, etc.) Cartography and attributes are cleanly designed for initiative user interaction.

### 3. What, if any, unexpected benefits did you achieve?

The County achieved unexpected external and internal benefits with our project. Most significantly was a 9-fold increase in requests for GIS products on our site. We went from an average of 10 requests per day to over 50 per day, as seen with website statistics. Our mapping products and data are reaching a larger audience than ever before.

Throughout the implementation process we uncovered ways to make our database attributes and layers more understandable to non-technical end-users, automated several data update processes, and implemented map service efficiencies. We were able to incorporate enterprise data from the County Assessor, Treasurer, Clerk and Recorder, Community Development, Road and Bridge, Open Space and Trails departments seamlessly to the end user.

We ended up purchasing Latitude Geographic's Geocortex Essentials and found that the technology is highly configurable with built-in functions, a framework design and workflows for customization that we can leverage in other technology projects in the County. An IT team is currently evaluating Geocortex as a replacement for our permit processing system.

### 4. What system design problems were encountered

We hired a consultant to configure the Geocortex generated workflows and reports. Prior to the configuration, it was pointed out that we should not change our layer names or field attributes in our database going forward because these workflows and reports will access these attributes as they are in our database. Although we continually improve our data, we knew there was a lot of information that was not understandable to people outside the GIS office. It was important not to continue the "internal knowledge only" with the opening of our data to a wider audience. We decided to spend several weeks reviewing each dataset and the attribute structure and updating it to be as intelligible as possible to people not familiar with our data.

This data clean up delayed the project for a month, but the end result is much improved production SDE data that is used across our organization.

### 5. What differentiates this system from other similar systems?

As explained in section A. 3. we designed the system with the goal of meeting 90% of our customers' needs while making it simple and fast. Based on our experience providing services and surveying our customers, we had a solid understanding of what they want to see in an end product and the questions that are asked to deliver that product.

We had a commitment and focus to provide comprehensible products and data to customers with a wide range of technical and mapping experience. It is clear from our site statistics, customer feedback and huge reduction in service requests, that we have achieved our goal.

Too often local and county GIS sites follow the "lets publish ever data layer we ever created" approach to online GIS services. Although this does get the data available to the public, it is rarely efficient or understandable for the customer and quickly becomes frustrating to use.

Pitkin County took the approach that instead of pushing out reports in relatively obscure formats, CSV and DBF formats (*try explaining it to your mother*), we provide the information in a pre-formatted PDF. If you want more interaction with the data, the same workflow creates a XLS that can be downloaded.

**D. Implementation**
   **1. What phases did you go through in developing the system?**

As mentioned in A. 3. Pitkin County had a solid understanding of end user requirements for our system. From this background information, we identified specific steps, input options and outputs for each function in a requirements document; released a RFQ looking for solutions; hired consultant for implementation and workflow and report creation; cleaned up our production SDE data layers for usability downstream; created map and image services for use in the system; tested site functions in an iterative process and provided feedback to our consultant; coordinated branding for the site; created a marketing and outreach program; conducted demonstrations and one-on-one training for customers; developed concise help videos for each site function; implemented site statistics to monitor performance and usage; and finally summarized the project with a benefits analysis and what's next.

   **2. Were there any modifications to the original system design? Why? What?**

We knew what we wanted to do but didn't know how to approach it, therefore we were open to our approach and design. When we identified user requirements, there were some items that we though we wanted to include in the system (i.e., end user examples of products), but through the implementation realized this was unnecessary.

**E. Organizational Impact**
   **1. What user community does the system serve and how?**

Pitkin Maps & More serves Pitkin County citizens, visitors, development industry professionals, the non-profit community, and county staff who are looking for essential County managed information about private property. The City of Aspen, Town of Snowmass Village and Town of Basalt are resort communities within Pitkin County that also benefit from the system.

   **2. What are the ultimate decisions/operations/services being affected? If appropriate, provide a few examples including, but not limited to screen input/output forms, paper products, or other descriptive graphics.**

The simplicity of the site obscures the complexity and content provided in each site function. By incorporating multiple County departments' datasets into the site, users have seamless access to a wealth of data while being unaware of the processing behind the scenes.

**Attachment C** contains screenshots of the workflow and end product examples for Mailing List, Property Report, Print A Map and ClipNShip. The search capability of "Go To" is also illustrated.

### 3. What were the quantitative and qualitative impacts of the system?

ArcGIS Server statistics and Geocortex Insights provide quantitative reports where we are collecting and monitoring Pitkin Maps & More performance and usage. During the work week we have up to 18 concurrent users on the system at any given time and are seeing approximately 750 workflow requests each day. From our baseline customer request information this is a formidable increase in use and reduction in staff time supporting these requests.

Feedback from site users has been extremely positive. Several internal users no longer use their Desktop ArcGIS software as Pitkin Maps & More is more understandable, faster and easier to use. External customers are downloading maps, reports, and data in several formats on their own schedule and do not have to contact or travel to our offices to complete the transaction.

### 4. What affect has the system had on productivity?

We have freed up over 1,200 hours of County GIS staff time by eliminating the processing and tracking of customer requests. This has increased GIS staff moral by eliminating such repetitive work. This staff time has been put into improving other spatial data workflows and data offerings that will be incorporated into Pitkin Map & More.

Internal and external customers seeking GIS information have saved time and resources as they are now able to create mailing lists, maps, and reports in a few minutes, rather than submitting a request and waiting for the product to be produced.

### 5. What, if any, other impacts has the system had?

End users have accepted the system because of its functionality and simplicity. County GIS staff was able to aggregate data from multiple County departments (Assessor, Treasurer, Clerk and Recorder, Community Development, Road and Bridge, Open Space and Trails) into a seamless system that reports on all this disparate data while keeping it current.

County GIS data and products now reach a much broader audience, with students, businesses, visitors, and curious citizens downloading and accessing County data.

We have received positive feedback from our clients and the community use, as they no longer have to go through a "gatekeeper" to obtain this public information.

6. **How did the system change the way business is conducted with and/or service delivered to clients? Give specific examples comparing the old way with the new.**

Old way: Each request came in via email, phone call or walk-in to the GIS department. The request was processed individually, payment was made, and the client was provided the product. Often times several days passed from the request to the product being delivered. Large datasets were placed on an FTP site and we needed to assist the user with FTP clients and login. Customers also had to physically come to the GIS office to pick up the mailing list, data disk or map, which involved travel time and parking issues in the congested Aspen core. With over 500 requests a year, this is a substantial staff and customer time savings.

New way: Section E 2 references the screenshots and products created via simple workflows . All GIS data and functions are freely available online, 24/7. Customers go to the Pitkin Maps & More site, choose the I Want to menu and select the function or product desired. Each workflow runs in a few minutes and is five clicks or less. The end product is formatted and notated with understandable information so the client knows the age and geographic location of the product. Data downloads are a simple browse and click interface.

F. **System Resources**
1. **What are the system's primary hardware components?   Give a brief list or description of the hardware configuration supporting the system.**

   - VMware Virtual Platform
   - Dell E5506 Quad core 2.13GHz  processors
   - Microsoft Windows Server 2012 Datacenter
   - RAM 16 GB
   - Disk space 830 GB

2. **What are the system's primary software components?  Describe the primary software and, if a commercial package, any customizations required for the system.**

   ArcGIS 10.3.1 Server
   ArcGIS 10.3.1 Desktop Advanced
   Latitude Geographics, Geocortex Essentials 4.4.3
   Latitude Geographics, Geocortex Viewer for HTML5 2.5.2
   Latitude Geographics, Insights 1.1

   No software customization was required for this project; however, Geocortex Essentials workflows were created that model and automate the repeating site functions.   The workflows build the guided step-by-step instructions for the end users to interact with specific functions.

3. **What data does the system work with? List and briefly describe the database(s).**

The system works with GIS data in multiple file geodatabases and a PostgreSQL database.   ArcGIS Server is used to create map, feature and image services of this data.  The ClipNShip function uses a SQLite database for tracking and processing orders.

4. **What staff resources were required to implement the system?  Report approximate staff and consultant time as FTE.**

The County hired a consultant to install, configure and create the workflows for Geocortex for the equivalent of 0.25 FTE.  County staff time on the project was the equivalent of 0.75 FTE for 12 months.

5. **Comment on anything unusual about the resources used to develop your system, such as data, software, personnel and financing.**

There was nothing unusual about the resources.  We had the support of County Management to pursue this project with was a contributing factor to our success.