A. System

1. Name of system and ESIG™ category for which you are applying

The Cuyahoga County GIS Department is submitting an application for consideration for the Enterprise Systems category for the Cuyahoga County Fiscal GIS Hub.
https://fiscalgishub.cuyahogacounty.us

2. A letter from the executive administrator authorizing submission of the system application (letters must be signed and scanned). --Please see attachment

3. Summary of what the system accomplishes and why it is exemplary.

The Cuyahoga County GIS Department, in collaboration with the Cuyahoga County Fiscal Officer, has leveraged the latest in GIS technology to create an all-in-one interactive site of useful tools and data. Through a collection of applications, pages, dashboards, and documents, users can find relevant information quickly and easily about tax valuation and assessment, property tax collection, and the tax disbursement processes.

Whether you are a homeowner wondering where your property taxes go or want to learn how the tax assessment process works, the Value Information Site piece of the Hub will provide you with what you need. Use recent sales to compare your home value to the latest real estate transactions, look up your year-over-year valuation changes, or see how your taxes dollars are distributed. Watch the ‘Understanding Your Property Taxes in Cuyahoga County’ video, created by the excellent Media Department, and learn how your tax bill is determined and what happens with the collected taxes.

The Fiscal Officer oversees the management of tax incentives on the parcels in the county, but what does that mean? The Incentive Information Site has you covered. Use this site to learn the Fiscal Officer’s role in the process, what incentives are commonly used, and how these incentives impact local communities. A combination of informative pages and interactive Dashboards allow anyone to see tax incentives in action.

The final section of the Fiscal GIS Hub is the Taxing Authority Site and is targeted towards local financial officers but is available to anyone interested in the role of the Budget Commission. This site contains all the reports presented by the Budget Commission, for each of the 105 taxing districts in the county. Various combinations of these tax districts make up the areas of assessment for every city, township, village, school, library, and other county-wide agencies. Every taxing authority has their own page with an overview of certified assessed values and the numerous reports that provide details on collections and disbursements. This site eliminated the Budget Commission’s previous website and provides added value of Dashboards that break down each taxing authority’s parcels and values.

Cuyahoga County is proud of the success the Fiscal GIS Hub has already achieved. It has been accepted with praise when presented to local mayors, managers, economic development staff, and regional agencies. It has been presented at multiple conferences, both local and national. How it works ‘under the hood’ is an often-discussed topic with others in the GIS community, where our peers are always interested in how it all works. We look forward to keeping the innovation going and have already begun working on updates to provide additional functionality and an enhanced experience!
4. Three “user testimonials”. – *Please see attachments*

**B. Jurisdiction**
1. Cuyahoga County, Ohio
2. Population (2022): 1,249,387
3. 2023 General Fund $502.1 million
4. Chris Ronanyne, County Executive, 2079 East Ninth, Cleveland, OH 44115
5. Dan Giersz, Senior GIS Analyst, 2079 East Ninth, Cleveland, OH 44115
   216-698-8493
dgiersz@cuyahogacounty.us

**C. System Design**
1. **What motivated the system development?**
The initial motivation came about when the Fiscal Office asked the GIS Department if they had heard of the 'GIS software' they were about to purchase, which was simply a suite of appraisal software that happened to have a map to display shapefiles. The GIS Department used this as an opportunity to educate the Fiscal Office on their existing resources, which were already bought and paid for.
   Through presentations and demonstrations of real-world examples from peer fiscal departments, some even within Ohio, the Fiscal Office was convinced they could leverage the existing technology to enhance their 2021 Triennial Appraisal Update and all appraisals going forward.

2. **What specific service or services was the system intended to improve?**
This solution improved or created access to Fiscal Office data such as sales, property values and value changes, tax rates and distribution details, tax incentives, and Budget Commission reports. It allowed for more effective education and communication with property owners and taxing authorities regarding the appraisal process and results.

3. **What, if any, unexpected benefits did you achieve?**
The Tax Incentive portion went beyond educating constituents of available programs and allowed local leaders and economic developers access to data they were not aware was available.

4. **What system design problems were encountered?**
Not all data was readily available to the GIS systems, such as abatements and TIFs, and new procedures were required. Communication with the non-technical Fiscal Office concerning these new procedures was difficult at times.
The overall layout and navigation of the multi-layered pages required custom HTML and CSS, while at the same time keeping within County branding standards.
The original number of pages steadily increased from around 80 to more than 100 and reports numbered from “about a dozen” to “many dozens”, as more information came to light from the Fiscal Office. There are 105 unique tax districts in the County that combine in various ways to create the school districts, cities, and other taxing authority jurisdictions.

5. **What differentiates this system from other similar systems?**
This system expands and extends the base solution provided by Esri known as “Equitable Property Value.” It includes additional data on tax incentives, tax distribution, and Budget Commission reporting. The Hub provides three sections, each with their own distinct purpose,
and this approach appears to be unique among counties in our region.

D. Implementation
1. What phases did you go through in developing the system?
Preproject Planning and Solution Design – Meet regularly with the Fiscal Office to determine minimum data requirements and capabilities and draft a solution design.
Phase One: Data Discovery and Preparation – Work with the Fiscal Office, County DBAs, and Esri Solutions Engineers, to design and implement the new database views that would be required, and set up procedures to keep them up to date.
Phase Two: ‘Value Information Site’ – At the request of the Fiscal Office, we first deployed the Residential Sales Finder to educate property owners on comparable sales in their area. Following that, the rest of the base “Equitable Property Value” Site was created with the Floodplain Inquiry Application and the Parcel Valuation and Tax Distribution Application, using the latest in Arcade abilities for dynamic popups.
Phase Three: ‘Incentive Information Site’ – Create Site and Pages for tax incentives, consisting of information to educate what the incentives are, examples of current and past projects, and dashboards to show where abatements and TIFs are instituted. Impact pages were created to show how municipalities and agencies are affected by these incentives.
Phase Four: ‘Taxing Authority Site’ – Create Site and Pages for over 100 unique taxing authorities and make reports available. This consisted of creating a base Page template with Dashboard and sections for reports by year. Then the page was copied, branding was updated, and filters applied to the Dashboard. The Gallery Cards that displayed the reports were filtered by Tags, which were carefully applied to the different report types and years. Python scripts were created to bulk create the over 4,500 document links and Tag them appropriately.

2. Were there any modifications to the original system design? Why? What?
The original design called for the ‘Taxing Authority Site’ to have credential-based access. It was decided that due to the overhead of creating and managing hundreds of accounts, and the fact that all data was public record, the Site and Pages would be made public. We also added additional Taxing Authority Pages to list all reports by year and not just taxing authority, which was a request of some end users.
The base solution included a ‘Tax Estimator’ application that was dropped because our Web group already had one available.
The arcgishub Python library was tested for bulk updating the Pages but was buggy and poorly supported. However, workarounds for some of the issues were created and it ultimately proved a useful tool.

E. Organizational Impact
1. What user community does the system serve and how?
The solution educates the property owners and citizens of Cuyahoga County about the appraisal process, tax rates and distribution, home values, and tax incentives. It also makes Budget Commission reporting more transparent and accessible.
The taxing authorities are educated on the impact of tax incentives and provided the reports needed to administer their taxbase. The tax incentive information also provides developers with a resource to gather information.

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.
Overall, the solution simplifies the way data and reports are provided to the public. This saves the time of the public and alleviates the workload of County employees that would otherwise need to assistance:

- The sales information can inform decision making when contesting values with the Board of Revision and saves users from needing FTP clients to download tabular sales with no geometries.
- The Floodplain application can inform on whether additional insurance needs to be accounted for when determining home value and saves the user from having to navigate to external resources which may be difficult to find and use.
- The Tax Incentive Site provides information on the application process and forms needed. It allows agencies to verify their approved incentives and see the impact they have on the tax base. It also allows for self-service by downloading the data.
- The Tax Authority Site becomes the ‘one stop shop’ for Budget Commission reports and makes more reports available than previous and completely replaced the old Budget Commission site.

3. What were the quantitative and qualitative impacts of the system?
Seeing tabular data transformed to geospatial data brought to light several issues concerning the correct taxing districts for parcels and where boundaries conflicted. There were also data quality issues that were identified and corrected, such as the inadvertent doubling of abatement values in certain reports.
The modern web designed interface of the solution is much improved over the previous websites used. It also makes more data available in one place. Year Over Year web traffic in some areas has increased upwards of 25%.

4. What effect has the system had on productivity?
The solution has allowed County employees to spend less time explaining appraisals and taxes to property owners and fulfilling data requests. Their time can now be more effectively used with the upcoming Sexennial Appraisal in the short term, and all other appraisals in the long-term.

5. What, if any, other impacts has the system had?
The solution has been received very positively by both internal and external users. It shines a positive light on Cuyahoga County as a whole, and specifically the Fiscal Office and IT Department.

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.
Previously, sales information, tax rates, and tax incentives were only available in tabular form via secured FTP or by contacting the Fiscal Office and having them send the information. Now anyone can simply view and/or download the data right from the solution.
Previously, Budget Commission reports were PDFs emailed to a large mailing list and only limited reports were available on their website. Now, reports are immediately available to everyone from within the solution and their previous website has been retired.

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.
No new hardware was required for the solution. The databases and ArcGIS Enterprise were
already deployed to servers and used in County day-to-day business. The existing databases, network infrastructure, and GIS software were leveraged to create new datasets and applications.

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

   This solution utilizes database views created in an Oracle database with Oracle’s SQL Developer. Microsoft’s SQL Server Management Studio was used to create the new geospatial tables and automate their updates, pulling the data from the Oracle views into SQL Server. ArcGIS Pro was used to register and publish the new data to both ArcGIS Enterprise and ArcGIS Online. Jupyter Labs was run from a cloned ArcGIS Pro arcpy environment and used to bulk create the required Document Items in ArcGIS Online and update the sales data every month, the abatement and TIF data quarterly, and the Certified Effective Rates and Certified Assessed Values annually.

   Data was shared to ArcGIS Online using a Distributed Collaboration, as well as direct publishing to hosted feature layers and tables.

   All Budget Commission documents are stored in Azure Cloud Services.

   The solution is hosted in ArcGIS Hub. All Sites and Pages were created using the Hub platform.

   ArcGIS Assistant (BETA), a tool created by Esri Professional Services and free to use by anyone, was used to customize the Hub content beyond what was available in the Hub web interface.

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

   Oracle database Version 12 (aka “The Warehouse”) is used to create views from CAMA (Sigma) and MVP (Manatron) systems.

   SQL Server Version 13 is used to create the geospatial data for publishing by joining the parcel geometries to the data pulled from “The Warehouse.” This includes layers with valuations and tax information, as well as layers for abatements and TIFs.

   ArcGIS Enterprise Version 10.9.1 was used to publish all data either as feature services from SQL Server (the parcels), hosted feature layers in Data Store (abatements and TIFs), or hosted feature layers in ArcGIS Online (sales layer, rate table, certified values table).

4. **What staff resources were required to implement the system? (i.e., report approximate staff and consultant time as FTE’s)**

   The overall project included 12 months of meetings, interdepartmental collaboration, design, development, testing, and go live.

   Main resources:

   **Cuyahoga County IT Staff** – The GIS Department, consisting of 1 GIS Administrator, 1 Senior GIS Analyst, 1 GIS Analyst, and 1 GIS Technician, made this the primary project throughout the year. 2 Database Administrators, 1 Network Engineer, and 1 Security Officer were utilized as needed, mostly in the first 3 months of the project.

   **Cuyahoga County Fiscal Office Staff** – The first month of the project required the Fiscal Officer, Director of Operations, heads of Commercial and Residential Appraisal, and Budget Commission Administrator for buy-in and contracting. The rest of the project was supported by 2 Appraisal Systems Analysts and Budget Commission Administrator that provided the data or access to the data.

   **Esri Professional Services** – Esri Professional Services product experts were leveraged for the
solution design and a Solution Engineer assisted with the development of the database routines needed to support the solution.

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

We contracted with Esri Professional Services as a ‘safety net’ to ensure the project’s success, since it so heavily relied on Esri components, and a lot of the plan was uncharted territory for our small GIS Department. We ended up needing minimal assistance, mainly in the beginning as we were getting it off the ground. Less than 30% of the budgeted amount for the contract was spent. The project also required working with multiple departments beyond our GIS Department, most with little to no GIS knowledge: Fiscal Office’s Appraisal and Budget Commission, the IT Department’s Security, Network Engineering, Database Administration, and Web Development Group.
May 24, 2023

Application for 2023 Urban and Regional Information Systems Association (URISA) Exemplary System in Government (ESIG) Award – Fiscal GIS Hub

Dear ESIG Review Team,

The Cuyahoga County Fiscal Office is privileged to present this application for the URISA ESIG Award.

The Fiscal GIS Hub is a one-stop shop for real estate, tax, and municipal budget information. Not only does it eliminate the need to navigate through multiple websites, but it provides new information and insights that were not generally available.

The Fiscal GIS Hub is a great educational resource for current and potential property owners and community members. Using videos, web maps and applications, dashboards, and informational pages users can learn about the appraisal process, property tax distribution, or incentives for development. For example, the Sales Finder application displays recent sales to give an idea of what nearby properties are worth and how much a property may be appraised for, and the Parcel Valuation and Tax Distribution application shows how property tax dollars support schools, libraries, parks, and local government.

Regional leaders can use the Fiscal GIS Hub to see the active tax incentives in their jurisdictions and access both current and previous Budget Commission reports. Dashboards provide them with quick overviews of their jurisdiction’s assessed values, land use breakdowns, and parcels with the highest assessed value.

The reactions and feedback concerning the Fiscal GIS Hub have been overwhelmingly positive. The GIS Department has presented the solution to many local leaders who are appreciative of the new resource. The GIS Department is also proud to have received Esri’s 2023 Special Achievement in GIS (SAG) Award for the Fiscal GIS Hub.

The Fiscal Officer is proud to nominate the Fiscal GIS Hub for this prestigious award and thanks you for your consideration.

Sincerely,

Michael W. Chambers, CPA
Fiscal Officer
May 18, 2023

Dear ESIG Review Team,

As the Cuyahoga County Appraisal Project Managers, it is our pleasure to submit this testimonial on behalf of the Cuyahoga County Department of IT - GIS.

The Cuyahoga County Fiscal Office is comprised of multiple County agencies: Appraisal, Real Property Tax, Transfer and Recording, Homestead, and the Budget Commission. The Appraisal Department is in constant contact with taxpayers, school districts, attorneys, mayors, and municipal finance directors. All these groups are looking for information, listed with multiple county agencies on multiple websites.

At the request of the new GIS Administrator, we scheduled a meeting to discuss the Appraisal Departments current GIS applications and what the GIS Department could do for Appraisal. One of the items discussed was the frustration our staff was encountering providing taxpayers with information that resides on multiple county websites. These multiple websites were creating confusion and frustration with the public. Without hesitation, the new GIS Administrator responded, “we can fix that”. Within a couple of weeks, the GIS team had developed a plan to centralize the data into one comprehensive website.

Hence the creation of Cuyahoga County Fiscal Office HUB, a one-stop shop for all your real estate, tax, and municipal budget information. No more multiple sites, bouncing back and forth from website to website, creating frustration and confusion. The Fiscal GIS HUB provides the stakeholders with an easy-to-use, point-and-click website.

It is my desire for you to consider the Fiscal GIS HUB as a model in government transparency and public service. Please feel free to contact us with any questions.

Sincerely,

_________________________
Lou Gentile
Commercial Appraisal Project Manager
Phone: 216-698-6595
Email: lgentile@cuyahogacounty.us

_________________________
Neil Winans
Residential Appraisal Project Manager
Phone: 216-698-2730
Email: nwinans@cuyahogacounty.us
June 1, 2023

To Whom it May Concern:

The Northeast Ohio First Suburbs Consortium, representing over one-third of Cuyahoga County’s population, would like to give support for the Cuyahoga County Fiscal Hub project. This tool has proved to be invaluable for many of the First Suburbs member communities and their residents.

Having worked with Cuyahoga County GIS staff on past projects, we were very excited as they started to discuss work on the Fiscal Hub. There is so much information that Cuyahoga County Fiscal Offices shares publicly but it can be very hard for residents to interpret much of it. The Fiscal Hub allows us to share data on things like tax distribution and parcel valuation for each address in our communities. Many municipal staff members have used the Fiscal Hub tool when preparing for public meetings as the visual tools make sharing this often difficult to understand information very easy to digest. Without having to visit multiple County websites, users can now easily learn countless details at the simple click of a button.

We applaud the work of Cuyahoga County’s GIS team – they heard the need for a better data source, and they created a tool that anyone can use to learn more about their property’s value and taxation. This tool helps to build a sense of transparency that is unparalleled.

If I can be of any further assistance, please contact me directly.

Sincerely,

Jennifer Kuzma
Executive Director

165 Center Road, Bedford, Ohio 44146   www.firstsuburbs.org
June 5, 2022

Dear ESIG Review Team,

As the head of the Cuyahoga County Multimedia Department, I am delighted to provide a positive testimonial endorsing the Fiscal GIS Hub.

Working with the GIS team to create the Hub's informational video on the assessment process was a fantastic experience. Moreover, the Hub as a whole has turned out to be exceptional. Its design presents a polished and user-friendly aesthetic. As a Cuyahoga County property owner myself, I have found the Hub to be a valuable resource, brimming with useful information. The recent sales data, in particular, proved immensely helpful when comparing my home’s value to others in my neighborhood.

I have also been enthusiastically recommending the Hub to others. On one occasion, a group of colleagues expressed frustration over their property taxes and a recent increase. Taking out my phone, I pulled up the Hub and showed them the tax distribution for their property. Upon realizing that their taxes were allocated to support initiatives like our remarkable Cleveland Metroparks system, they began to view their tax bill in a different light. This transformation was possible thanks to the clear and informative data provided by the Fiscal GIS Hub.

I firmly believe that the Fiscal GIS Hub is already making a positive impact and will continue to be an invaluable resource for our county in the years to come.

Sincerely,

Jonathan Shick
Multimedia Manager
Department of IT – Cuyahoga County