URISA ESIG Award Application 2017

Integration & Innovation at Racine County
Building a GIS that Opens Doors for the Enterprise and Beyond

Submitted by: Tyson Fettes, Register of Deeds, Racine County
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Racine County ArcGIS Online Public Apps .................................................................................. Error! Bookmark not defined.
A. SYSTEM

1. Name & Category
Name: Racine County Land Records Management
Category: Enterprise Systems

2. Letter from the executive administrator

May 30, 2017

RE: Authorization of Submission for URISA Exemplary Systems in Government Award

To Whom It May Concern:

It is our pleasure as County Executive and Register of Deeds to authorize Racine County’s submission of its enterprise GIS for consideration for the above award. We believe this is a system that is very deserving of this award. It is, in our opinion, exemplary, based on the many ways in which it has positively impacted the way we work and how we serve our community in just two years. It has brought improved productivity, better and more efficient public service, and excellent and innovative collaborations across departments, municipalities, and local organizations. The availability of an improved land information system benefits our whole County and beyond.

Racine County consistently garners public compliments on its usefulness and relevancy. Information that once lived in Excel spreadsheets is now visible, interactive, and mobile-friendly. The ARC-GIS mapping tool has proven valuable to not only the traditional users such as realtors, surveyors, and title companies, GIS is expanding its appeal to visitors and residents. For example:

- As demonstrated during our Emergency Training, in the event of a real crisis we can constantly update the GIS map of the disaster incident, staging areas, shelters, and relevant data to effectively inform the public of needed services.
- Sales Comp Finder makes searching for and locating residential property sales comparables easy. Access to this information facilitates better real estate decisions.
- The Recreation Gallery maps bike trails, dog parks, farmer’s markets, and will soon add the Family Resource Directory and the Farm Fresh Atlas.

GIS has greatly improved efficiencies for several departments in our County. It has also served as a great tool for our constituents.

We are very proud of the progress that the enterprise GIS and those implementing and using it have enabled the county to make, and we believe there is enormous potential for its positive impact to grow even further in the coming years.

Sincerely,

Jonathan Delagrave
Racine County Executive

Tyson Fettes
Racine County Register of Deeds
Racine County Enterprise GIS: URISA ESIG Award submission

3. Summary of system; Why it is exemplary

Racine County’s land records management system consists of a web-based enterprise GIS that replaced a decade-old legacy system, improving the way Racine County’s government works across the organization and with the public.

Working together, the land records office and Register of Deeds office, led by Register of Deeds Tyson Fettes, spearheaded the development of this system. When elected to office in 2012, Fettes prioritized leveraging a lean approach to technology to do more and achieve better value for departmental and county budgets. Simply asking questions that had never been asked before, such as why land records documents were not available in an online portal, and acting on them, was the key to making real change happen.

A system modernization plan was put into action, starting with updating the Register of Deeds and tax systems. With these systems improved, Racine started to see its investments bringing significant returns. Departments that weren’t previously involved were starting to benefit, staff were becoming more efficient, and the public liked the changes they were seeing. Momentum was building, leading to the next step – GIS land records modernization.

When it came to the new GIS, Racine knew it would be a big project with the potential for even bigger results. Its desire for up-to-date data, easy-to-use task-driven applications, centralized data, mobile capability, and fast access to information was comprehensive and offered vast possibilities for the entire organization. But the county also knew it couldn’t do it alone. As a lean county, Racine couldn’t resource the project alone, so enlisted the help of veteran local government GIS firm Pro-West & Associates, which fit the county’s requirement for a partner that could work within its budget, would provide leadership, and that it felt certain it could trust.

Working with Pro-West, Racine forged ahead with updating its land records management system. The project began with an initial phase in 2015-2016, and has maintained momentum through 2017. As the system matures, staff have been able to identify areas to enhance business processes across departments, improve service to users outside the organization, and streamline the GIS function. Many more positive changes have been implemented as a result. For example, GIS has become a critical part of the County’s emergency management strategy.

Many are surprised to learn that Racine, the 5th largest county in Wisconsin, has only 2 staff members with GIS duties, both of whom fulfil multiple roles outside of GIS and one of whom is not a trained GIS professional but rather has oversight of the function. A key component of the reason for the new enterprise GIS being exemplary is that it enabled 2 part-time GIS staff to manage a modern system that services the entire organization and external users.

The new GIS consists of:

1. Esri Local Government Information Model & Parcel Fabric

Once Racine defined its GIS goals and embarked on the path to achieving them, it became clear that the Local Government Information Model and parcel fabric offered the best environment to get there, as they would allow the data to be directly consumed by ArcGIS Online web and mobile templates.
Data was standardized in the Local Government Information Model – rather than remaining in multiple silos – and converted to the parcel fabric – a new and daunting concept for Racine. Training equipped Racine to be self-sufficient in editing its own data in this environment – the most efficient way to keep data updated.

2. **Public map gallery**

Racine identified the need for simpler, task-driven maps as an alternative to the existing application which had many layers and many tools, making it extremely slow and difficult for users without GIS expertise to understand how to find the information they needed. A portfolio of **25 single-function web maps and apps** was created using Esri ArcGIS Online that anyone, regardless of GIS experience, could use quickly and easily.

The public map gallery includes applications that replace paper documents and manual processes, and range in subject matter from **zoning information** to **farmers’ market locations**. With the right training completed, Racine County is able to create apps in the public gallery independently.

This component of the project has been critical to **increasing citizen engagement**. The public gallery and all apps are optimized for mobile devices to ensure the public has access to information wherever they are.

Maps and apps currently in Racine’s public gallery:

a. Racine County Mapbook
b. Tax Parcel Locator
c. Sherriff Foreclosures
d. Treasurer Tax Foreclosures
e. Racine County Recent Sales
f. Land Use “Buffer” Public Notification
g. Open Data Portal
h. Racine County Supervisor Districts
i. Racine County Industrial Land & Business Parks
j. Racine County Land Notification
k. Racine County Landshark
l. Racine County Tax Inquiry
m. Register of Deeds Updates & Enhancements
n. Tax Bill Mailing Address Online Submission Form
o. Lottery and Gaming Credit Search – new
p. Sales Comp Finder – new
q. Election Polling Places – new
r. Floodplain Inquiry – new
s. Survey Search – new
t. Zoning in Racine County – new
u. Medication Drop Boxes – new
v. Parks of Racine County – new
w. Racine County Dog Parks – new
x. Racine County Farmers Markets – new
y. Racine County Trails – new
3. Publishing script
A script was created to automate nightly updates to data consumed by the GIS system, mapping updated data to its published location.

4. Integrated systems
New systems bring many advantages, but only deliver maximum value once they can “talk” to other systems.

Integration of Esri’s ArcGIS Online, ArcGIS for Server, ArcGIS for Local Government solution templates, custom solutions, business workflows and the Local Government Information Model have resulted in a mobile-ready, near-real-time, visual communication portal. These are integrated with other business systems including Racine’s tax and register of deeds system, serving up all related data in a single step via an in-app pop-up window. For example, a user of the Sales Comp Finder app can click on a property that meets their search criteria and in a single pop-up window can access tax records, Assessor’s property card, and all other recorded documents related to that property.

5. Enhanced business processes
The most significant change to Racine’s processes are the benefits of focusing on collaboration. Internally, more departments are actively making maps.

The County and City of Racine teamed up to enhance and standardize data sharing practices between the two organizations, extending the use of data and solutions by the public and internal staff.

The county has established creative partnerships with local organizations – such as realtors and the county’s economic development organization – partnering with these organizations to create apps that allow them to do their jobs more easily and help promote the county.
6. **Strong brand identity**

A county is a brand like any other organization. A good brand unites customers and culture; it adds meaning, purpose, and recognition. Racine’s public map gallery has a distinctive brand identity, introducing a consistent look and feel and simple, distinctive style across all of its graphics.

![Racine County Land Information](image-url)
1. User Testimonials

Wendy M. Christensen, Racine County Clerk

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OFFICE OF THE RACINE COUNTY CLERK
Wendy M. Christensen
730 Wisconsin Avenue, Racine, Wisconsin 53403
E-mail Wendy.Christensen@goracine.org

Phone 262-636-3482 Fax 262-636-3491

Tyson Fettes
Racine County Register of Deeds
730 Wisconsin Avenue
Racine, WI 53403

May 30, 2017

Tyson:

I am writing to express my appreciation in support of the Racine County Register of Deeds Office use of their GIS mapping system. Your office has used the system to create an Election Gallery which can have multiple maps to provide additional resources for our residents.

The Election Polling Places interactive map allows voters to easily locate their correct poll for an election. The feature includes the name and address of the poll, as well as contact information for their municipal clerk. Constituents can also use the Racine County Supervisor Districts map to pinpoint their address. This allows them to determine which district they live in and the name of the Supervisor who represents that area.

Both of these features have assisted the County Clerk’s office in providing another option for residents to find information they seek. The map also provides them the convenience of obtaining the information outside of normal office hours, reducing the need to contact the office by telephone or wait for a response to an email request.

I look forward to other uses of the system in the future to create additional ways to provide information to our users.

Sincerely,

Wendy M. Christensen
Racine County Clerk
May 26, 2017

To Whom It May Concern:

I am pleased to provide the following feedback about the Lottery Credit Finder mapping on Racine County’s website. I am grateful for Kim Christman’s efforts in the creation of this tool. This allows property owners to search online to determine if they are receiving the lottery credit for their property. If the parcel is eligible but not currently getting the credit, the application form is available. Also, if the parcel is assigned the credit but ineligible, the removal form is available. These forms may be printed, completed, and mailed to the County Treasurer’s Office without need to contact my office for the information and forms. This self-service option is available 24 hours a day, seven days a week, every day including holidays.

The on-line mapping tool also provides links to other resources for more information about the lottery credit. The links include a lottery credit informational brochure created by my office and a link to the Wisconsin Department of Revenue explaining the program.

This functionality has improved the efficiency of my office since many property owners are utilizing this on-line tool. This allows my staff to devote more time on other duties. But most importantly, this on-line resource has increased the Racine Community’s awareness and understanding of this important property tax credit.

If you have any questions or comments, please communicate with me.

Sincerely,

Jane F. Nikolai
Racine County Treasurer
Kim Christman, Real Property Lister

URISA
701 Lee Street, Suite #508
Des Plaines, IL 60018

Tyson Fettes
Register of Deeds

Tracey Feichtner
Deputy Register of Deeds

Kimberly Christman
Real Property Lister

5/31/17

To URISA ESIG Award Committee,
My name is Kimberly Christman, and I am the Real Property Lister for Racine County, WI. My job duties include (but not limited to) maintaining the tax roll for Racine County, and maintaining the GIS system for Racine County. With my job, I have many expected deadlines and daily duties so improving productivity is necessary to grow our mapping infrastructure. In the previous implementation, I would be expected to review and update the tax roll system daily. This process would be anywhere from a week to 3 weeks behind the original recording date. Then on a quarterly basis I would update the personal geodatabase. Once the map updates were complete for the quarterly process, I had to begin the process of data manipulating and merging to push the map data out to the web application. Also, I would publish ArcReader maps to local municipalities on a quarterly basis. I would also print hardcopy quarter section maps of each that had an update. I would then make a copy of the map for the local Clerk, local Assessor, the planning department, and one for our office book. As you can imagine this process was time consuming and, also, presented opportunities for errors to occur. Did I make all the changes, did I forget to print a map, did I make a copy of the data for a certain municipality... the list goes on and on. Now the current implementation updates nightly to the web service, we have an open data portal set up to also update nightly, we have a quarter section print available in our Mapbook Application, and we display tax driven applications that allow users to access exactly what they want 24/7. I can sit at my desk and make a map update knowing that once I sync up my version of the data, this update will be available tomorrow on the website.

The current implementation of enterprise GIS has improved daily processes along with providing a story to tell. The boring behind the scenes’ improvements are amazing, however, this project has given a tangible story to share with non-technical people. In the age of Google and keeping things simple (but fast) the task driven applications have provided evidence that this project was worth it! The results of having useful applications available to the public have increased the awareness to other departments that they too would like to benefit from this “Good Press” movement. Before this project, I would say approximately 90% of departments did not know anything about GIS. Now we have an application that showcases the Sheriff Foreclosure Sales and, also, a Treasurer’s Foreclosure Sales. We have an application that displays Sales in Racine for the last two years and allows users to search for Sales Comps in Racine County. We have worked with the Treasurer’s office to create the Racine County Lottery & Gaming Credit application so staff and the public can search by name, address, or parcel number to see lottery credit status on property in Racine County. This application has dual purposes of educating the public on the availability of the Lottery & Gaming Credit and, also, to help staff search for possible issues with the status of properties. We are currently working on more department driven applications that will benefit internal staff along with educating the public.

Just to give you an idea of how this new implementation of Enterprise GIS will improve things here at Racine County, we will no longer rely on sites of data to run internal applications. We have users in different locations and because of network speeds we were forced to have multiple copies of the data to run internal applications. Now I have moved our existing and archival data into the LGIM (as much as possible) to have it be in a centralized location. The applications we are using internally are also public applications from ArcGIS.com. Also, the versioned editing allows for multiple users to access the same data without the fear of it being out of date. They just reconcile their data connect.

Overall, the new implementation here at Racine County has increased productivity, provided ways to work with other departments, and offered a faster, better product to the public.

Thank you,

Kimberly Christman
Real Property Lister
B. JURISDICTION

1. Name of Jurisdiction
Racine County, WI

2. Population served by the organization
Racine County serves its population of 195,000.

3. Annual total budget for jurisdiction
$159,801,739

4. Chief elected official
Jonathan Delagrave, Racine County Executive
720 Wisconsin Avenue
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5. Contact person
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C. SYSTEM DESIGN

1. Motivation for system development
Racine’s existing geographic information system (GIS) had been implemented a decade ago. In the years since, the GIS had gradually faded from state-of-the-art to markedly outdated. It was too slow to offer efficiency, had many layers within one web viewer, creating a crowded and complex user interface, and lacked the mobile capability expected by today’s citizens and workers – more than half of whom access maps on mobile devices.

Data, which is the foundation of the work done by the county’s land records office and many other departments, as well as user groups such as the public, realtors and other sectors of the community, was heavily siloed and updates were limited to once a quarter.

The county was motivated to find a better way.

It could no longer afford to serve land records data to internal and external users that was already 3 months out of date; data needed to be managed in a standardized way and shared easily with those who needed it.
Furthermore, the existing GIS was highly customized, meaning the county relied on an outside source for even the smallest change. To become efficient, the County needed to achieve self-sufficiency.

Where multiple sources of data related – and added value – to each other, manual searches had to be completed. The GIS and other systems, such as the recently updated tax system, could not communicate with each other, making the process of finding all relevant information for a particular record extremely laborious.

Integrated systems mean integrated departments. The county desired greater inter-departmental collaboration in order to further increase productivity and allow the whole organization to benefit from the technology available.

In all, the county’s GIS did not meet citizens’ expectations – and county standards – for service and performance, and offered no room for growth. In addition, the county needed to be more connected – internally and with its community – and more competitive.

Racine County, led by the Register of Deeds and Land Records offices, decided the time had finally come to overhaul the system and establish a new enterprise GIS that delivered task-driven GIS services, centralized data management, integrated systems, accurate data, and mobile capability.

2. Services intended for improvement

Publishing accurate data efficiently was a priority, which would involve a great deal of work “under the surface” to make it happen. The month of data manipulation required to prepare information for a public-facing site needed to be drastically reduced.

Service to users outside the organization was an important contender for improvement. Assessors whose work depended on county land records data needed to be able to source copies of surveys and other critical documentation without having to physically visit the Racine County office. Citizens needed to quickly access and easily understand information regardless of their experience of using GIS, and staff at other municipalities within the county such as the City of Racine needed efficient access to mapping updates that affected them, rather than waiting for the County to make the updates and send them to them. Also within this service area is information that needed to be taken from paper to an online mapping application to achieve greater reach and efficiency – for example a list of property foreclosures previously posted on boards in public places, and sales that were published in the local newspaper.

Internal service was also critical. Inter-departmental workflows required focus to expedite the process of recording a deed and changing the map correspondingly, and the reduction of dependency on a staff member with GIS expertise to create or edit a map. The current state involved highly dispersed departments, each independently holding data that was in organized in multiple formats and not available or accessible outside of that department.

Key Motivational Factors

Racine was motivated by the need for:
- Updated GIS infrastructure
- Faster performance
- Simpler interface
- Centralized data
- Integration with other business systems
- Ability to share up-to-date data
- Self-sufficient maintenance
- Meeting citizen expectations, e.g. mobile capabilities
- Scalability
- Internal/external collaboration
- Elimination of manual processes; implementation of automation
- Becoming competitive
As such, data management would be critical to the new GIS and the ability to improve all services noted above. The county’s vision revolved around a central repository for data, using a standardized format, offering easy access, and ensuring data was always up-to-date within 24 hours.

3. Unexpected benefits
The improvements we saw as a result of the enterprise GIS implementation exceeded our expectations.

We weren’t previously aware of the difference that the right publishing scripts could make, eliminating all effort from publishing updated data to any application through which it is served, every day.

Overall ease of use is greater than anticipated. Many county employees and external users who had never previously touched GIS were able to start using and understanding it quickly. In turn, an additional unexpected benefit – but one crucial to the system’s growth and success – has been the ability of County staff members to identify even further opportunities for GIS expansion via new web-based apps.

The efficiencies we have achieved – and the potential for more – also exceeded our expectations, as has the extent – and associated value – of interaction between multiple systems.

The new Survey Search app, which enables users to access all of Racine County’s plats of survey, has proven valuable to users beyond the intended audience of homeowners. Survey companies operating in the community are also gaining great value from the information it serves at any time to any device.

4. System design problems
The greatest system design challenges on Racine’s GIS implementation project related to the coordination of IT resources across multiple departments. Previously, data and documents were maintained digitally, but information from these documents were sent directly between staff. This human-to-human connection was valuable and convenient, however, when we began to automate pieces of the process, two significant stumbling blocks were discovered:

1. Data was not always accessible from a machine in one department to another. For example, the nightly geoprocessing scripts ran on a server within GIS department, but the data it needed to consume resided on a file server in another department. Prior to this project, Racine had never had a need for this type of access.
2. Data was not always consistent. Since a human was always involved, inconsistent data was common. People adapt well to minor inconsistencies in data sets; computers, conversely, do not. Fostering agreement among departments and gaining buy in on freezing spreadsheets and database formats was the second major challenge as the project progressed.

Fortunately, the Racine staff members involved in the GIS implementation have an excellent working relationship with the County IT department, allowing these technical issues to be resolved effectively and without delay.

5. Differentiating factors
The system deployment at Racine County was the most comprehensive project that our GIS vendor, ProWest & Associates, had delivered in 30 years of GIS implementations for local government in terms of the breadth of the web GIS platform that it embraces. We leveraged web maps, story maps, configurable web applications hosted in ArcGIS Online, Web App Builder Developer Edition with custom widgets, and an open data portal to create a comprehensive and cohesive system that meets both our short- and long-term needs.

The project involved several county departments that had not previously coordinated with one another. By taking existing processes and tying the work product to a web GIS solution, other departments were able to see the advantages of integrating spatial information with their existing data. The speed of development and level of flexibility and control that the county has gained and maintained post-delivery further exemplified Esri web GIS technology as an effective platform for delivering local government data to the public and for support internal processes.

In addition, we are unaware of a comparably sized County that operates a modern and valuable GIS with as lean a staff as Racine. Thanks to tools and techniques such as automation, integration, self-service apps, and centralized data, we are able to keep our GIS updated, performing to the required level, and serving users what they need with only 2 part-time staff members.

D. IMPLEMENTATION

1. Phases of development

Planning
The key to planning and implementation was first inventorying and designing a server configuration to support the Geographic Information System. The county received recommendations for configuration of multiple virtual machines (VMs) to support the GIS, including a SQL Database server and a GIS Web Application Server. For the most efficient and cost-effective solution, the installation and configuration of the majority of configuration tasks was performed via remote access to the system.

Design
The goal of creating a design for geospatial data and databases was to optimize licensing and performance and host all the county data through cached data files, such as imagery and data files such as geospatial parcel boundaries. The design looked to the future for acquisition of imagery and LiDAR as needed. In addition, back-up and recovery practices were recommended for the data tiers.
Local Government Information Model & Parcel Fabric
Data as the foundation of all local government GIS—and having data in a centralized, standard format that is accessible by all—is key to growing the economy and driving decisions by County staff. Migrating parcel boundaries and related land records data to the Local Government Information Model (LGIM) provided the County with an efficient method for the development of new parcel features and maintenance of parcel data as part of a complete land records solution.

The first step in migration required the time and skills of Racine County staff to review their current parcel features and related land records data, perform data checks and clean up the data (resolve all gaps, overlaps, parcel features in question and non-coincident features). County staff and Pro-West & Associates staff developed a collaborative working relationship to determine which data should be migrated, develop protocols for using commercial-off-the-shelf (COTS) tools to optimize the data, apply topology rules, and resolve errors. Pro-West provided guidance throughout the migration process, and the county undertook extensive preparation tasks, input to protocol, and final quality assurance.

Web App Configuration
The County's need for configurable applications was two-fold. The "deed to GIS workflow" for the Register of Deeds office was revamped to improve the efficiency of the current paper map process, and the Register of Deeds needed a simple to use and easily accessible mapping application to serve the office and the public.

The first phase of implementing web application configuration was to configure Esri's Deed Drafter app to enable mapping technicians to enter metes-and-bounds descriptions from deeds and recorded documents and check for closure errors. This first phase required both configuration and workflow input from the county, and culminated in training all Real Estate staff through webinar trainings on the use of Deed Drafter.

In turn, web application configuration was extended to develop other applications by customizing or configuring multiple widgets to meet the business needs of the county. The configuration of ArcGIS Online-based web apps has grown significantly to 25 solutions in under 2 years.

System Integration
Racine County's Register of Deeds, Tyson Fettes, coordinated presentations and discussions with other departments within the County to ensure that all data was referenced and standardized to the planned GIS, and all staff were included in planning for the most effective information distribution and use. In addition, outside vendors were included in periodic meetings to gather specifications for integration into the system, such as Transcendent for the tax parcel data and Esri for server and web application configuration.

Racine County Economic Development Corp was included in discussion about the new tools and opportunities as data was migrated and applications were developed. The county wanted to put in place tools that would complement those provided by the State's Economic Development website tools (WEDC), and garnered support from the Wisconsin Realtors Association for input into mapping components that would make their jobs more efficient.

Currently, our GIS integrates with the following business systems to provide instant access for users to all related information held by the County via simple web applications. All of these systems also interact with each other:

- Transcendent – tax information
• TriMin – recorded documents
• LandShark – land record documents

The newest integration to take place, in May 2017, was with our TriMin system, which we use to manage recorded documents. Prior to the integration, a user searching for scanned documents for a parcel number needed to open our Landshark system and create an account before purchasing the document they wanted to view. Integration has eliminated all manual elements of the process. Users can access documents via GIS without creating an account, skipping directly to the document purchase stage of the process.

Training
Several trainings were provided to Racine County staff by Pro-West & Associates. A multi-day Parcel Fabric training educated the county staff on how their data was migrated into the Local Government Information Model (LGIM) Parcel Fabric and equipped us to independently maintain parcel data in the Parcel Fabric moving forward.

A one-day training course was given to bring all of the staff up to speed on the breadth and depth of their web GIS solutions. This training started with the data in the LGIM and walked the staff through the process of publishing services, developing web maps and configuring additional application templates. Our staff was able to quickly begin taking over the responsibility of updating their existing application templates, as well as creating new applications to respond rapidly to internal and external needs.

The Future
Development of the GIS did not end there. One of the most valuable aspects of the new system is that there is room for growth, which means efficient continual development. Future plans include expanded collaboration with external entities and additional departments within the county, as well as configuration of more web applications for the public. Specifically, the following web applications are in planning:

• Family resource directory – Racine County’s Family Resource Directory currently exists in the form of a 200-page physical directory of resources for local people in need. A web application will instead make this an interactive online directory with hyperlinks and contact information for the organizations providing assistance. A GIS web map will display the locations of those organizations and their category (e.g. assistance for parents, veterans, or minorities; energy services; legal resources; housing assistance; or, pregnancy support). The application will be available via individual organizations’ website as well as the County’s site and will be continually updated – unlike the paper directory which becomes out-of-date the moment it is printed.

• Election Results – to serve the public in the lead up to the November 2016 elections, we configured and deployed an Election Polling Places app to assist voters in finding where to vote. To add to this, we are planning an Election Results app which will provide voters with at-a-glance information on the results of elections conducted where they live.

2. Modifications to original design
All of the components, except one, were able to be implemented without major modifications to the original project scope. The only significant deviation from the original design was related to the County’s MapBook application, specifically the web-based printing solution.
Originally, the application was specified to use the Web AppBuilder Print Widget and a custom Web Map Print geoprocessing service that contains custom layout templates developed by the County. After the initial development and testing, we quickly identified a misunderstanding in the original scope – users of the MapBook application were not interested in printing out the contents of the map that they were viewing on the screen. Rather, they desired that a highly specialized, fixed scale print-out be generated based on the area of the map that they were currently viewing.

With the expectations clarified, Pro-West & Associates created a custom geoprocessing service that utilized Data Driven Pages in conjunction with a custom Web AppBuilder Widget for selecting the Area of Interest. This provided the users with the output they expected and a streamlined interface for identifying the target features.

The original Web Map Print service was retained, however the default Print Widget was replaced with the community Print Plus widget based on favorable user feedback.

E. ORGANIZATIONAL IMPACT

1. User community served
Racine County’s new GIS benefits a number of user communities. From the outset our focus has been on providing everyone with direct connections to information through task-driven applications.

Internal departments
The Register of Deeds and Land Information departments, which led the GIS improvement program, have had a total overhaul of how they accomplish their core responsibilities. Our roles are focused on information – making sure it is accurate, timely, available, valuable, and accessible. Thanks to new tools, training, and integration, we are able to accomplish these objectives and better serve the rest of the organization and those who live in Racine County.

The Treasurer’s Office is able to communicate up-to-date information on tax foreclosed properties with ease using the Treasurer Tax Foreclosures application.

The Sheriff’s Office is able to deliver a more efficient public service as a result of the Sheriff Foreclosures App.
The new enterprise GIS is also benefitting Development Services in relation to permitting and zoning, particularly in determining ownership.

The Real Property Listing department is able to map out legal descriptions online by hand, among other benefits – saving vast amounts of valuable time and communicating accurate information in a timely manner.

Assessors no longer have to visit our office in person to obtain copies of surveys and other documents. All information is up-to-date and online and can be easily accessed wherever and whenever they need it to do their jobs efficiently.

County Supervisors also benefit, and their understanding and buy-in was critical to the success of the new GIS. In demonstrating that the modernized GIS is much more than a mapping application, we demonstrated to Supervisors how it will impact their roles. The Supervisor Map promotes better engagement between supervisors and citizens, informs the latter of their elected supervisor and telling the story of what supervisors do for the county.

As the system matures and the benefits are visible across departments, we are seeing ideas for more task-driven applications from parts of the business that never before had a say in our GIS and did not benefit from it. Simple, focused apps are engaging Racine County staff by making GIS accessible. As such, Racine has defined a plan to expand the enterprise GIS to even more departments in the future including Public Works and Emergency Management.

Private industry organizations in the county
Racine collaborated with local organizations to garner input and ensure the county was serving these groups with the information they needed to work as productively as possible in the community. For example, Racine held focus groups with realtors to assess their needs and challenges and create apps that would allow them to do their jobs more easily and help promote the county.
Racine County Economic Development Corp gains value by using the county’s Open Data Portal and providing potential investors in the area with a story map of industrial land available for development on its website.

Title companies in the county are benefitting from using our GIS to map legal descriptions and view general information about properties.

Local surveying businesses and engineering firms are also benefitting from such capabilities as mapping legal descriptions, easements, and locating surveys on properties.

The public
At Racine, we knew that consumer expectations far exceeded what we were able to offer with our previous GIS system. They had specific queries, wanted to use maps on their mobile devices, needed to find information quickly and, of course, did not have GIS expertise. With a desire to improve customer service, we needed to meet these needs. The system we implemented offered:

- Single-task maps and apps to allow users to instantly select the relevant app from the public gallery. Themed galleries within the overall public gallery, e.g. Foreclosure Gallery, Real Estate Gallery, Recreation Gallery, help users make their selection at a glance. Performing only one task meant the apps were not slowed down by large volumes of data and tools.
- Mobile-enabled maps and apps
- Easy-to-use, intuitive apps, that involve nothing more complicated than zooming to and clicking on a point
Listed below is a small sample of the web applications we have created to serve the citizens of Racine County, and specific ways in which they benefit that specific user community:

- **Lottery and Gaming Credit Search** – data from the County’s tax system is displayed on a web map and color coded to indicate whether or not a property has a lottery applied to it. A form is available via a hyperlink in the app for users to apply for a lottery credit, and to find out more information about the Lottery and Gaming Credit program. The user can complete the whole process online rather than having to visit the County offices.

- **Sales Comp Finder** – the public can rapidly find the assessed value, sales value, challenge their property’s assessment, and view comparable properties to accomplish tasks such as finding out the potential amount for which they may be able to sell/buy a property.

- **Election Polling Places** – providing the ability to enter the address at which a voter is registered, and view the correct polling station, along with a map and step-by-step driving directions for getting. In addition to the existing public facing apps, we have plans for more. One example is an online events calendar to keep the public informed of important events taking place in the County.
Local municipalities
We knew that collaboration would be key to getting the most from our new system, and it was important to us that our drive for better customer service included not just the public and internal users but other municipalities within our county. All of these municipalities holds its own data, has its own GIS, and performs its own property listing. Anyone looking for data on more than one municipality had to visit multiple websites to find it. Racine saw an opportunity for efficiency and better service. We established data sharing practices with 10 municipalities including the City of Racine that mean land records information for those municipalities is available via the county GIS as well as that municipality’s own site. Users no longer have to visit multiple sites to find what they need. Data publishing scripts implemented with help from Pro-West & Associates connected the municipalities’ and county’s data and make automatic updates.

Additionally, staff at municipalities within the county can instantly see mapping updates that affect them, rather than having to wait for the County to make the updates and send it to them, creating a streamlined workflow and up-to-date data.

Racine worked with all 10 municipalities within the County to create a county-wide zoning application offering mutual benefit to all entities and those they serve. Our Election Polling Places app also serves individual municipalities and their citizens by providing an easy-to-use way of instantly finding where to vote and using the Directions tool to learn how to get there. For the November 2016 elections, municipalities shared a link to the app on their websites, reducing incoming inquiries and meeting public expectations by providing convenient access to data on any device.

2. Decisions/operations/services affected
The County integrated key components of the Esri platform, internal business systems, and workflows to fundamentally transform how location-based information is distributed, analyzed, and consumed throughout the County and surrounding region.

Map production and editing is a capability that is no longer a confine of the land records office. Maps offer a much more powerful way of communicating information than, say, a spreadsheet or It has opened
opportunities for many other departments and individuals to be custodians of their own maps, using self-service rather than relying on land records staff members to create these products. This is a significant step in Racine’s mission of connecting everyone directly to information. While departments can independently use Esri ArcGIS tools to generate their own maps, land records staff can focus on moving their department forward in a strategic way – focusing on high value enhancements and future direction.

Racine’s data management practices have changed significantly. Prior to the new system implementation, data was siloed in departments, with each department using its own preferred format and few knowing what data existed elsewhere that could increase the value of their own. Redundancy, error, and inefficiency were rife. Introduction of the Esri Local Government Information Model and Parcel Fabric has brought standardization to our land records data, adding meaning, accessibility, and integration capabilities so that we can all see the relevant data that exists. Standardization in this model allows us to easily publish data and ensures it is updated every night using the automated publishing scripts created as part of the new system.

Data editing is a much different operation than it was previously. Previously, a month of work by a member of staff in the land records office was required to prepare data to become public-facing. Now, internal users can edit in a single place, with a map service that is updated nightly to the cloud. Data can be used in any application by any staff member in any location.

Public service delivery is an entirely different operation than previously. In response to known shortfalls, the focus has been on speed and ease of information delivery, and mobile device capabilities. We knew that the public wanted to accomplish a single, specific task quickly and from any location. Now, we are able to meet this expectation. The public is also able to accomplish many more tasks independently without having to contact the county or visit our offices, enhancing self-service capabilities and efficiency.

How our county works with others has changed significantly. The well-established working relationships we had built within our organization and with other municipalities and businesses in Racine paved the way for developing the much more collaborative approach that is now in operation. We have implemented well-defined and closely followed data sharing practices that involve working together in a much more meaningful way that is designed to bring a high return for all stakeholders. From focus groups with local realtors to sharing data with the City of Racine, together we are all making valuable strides to work more productively, provide better service, and in doing so prove the principle that the whole really is greater than its parts.

Deciding on the right public services to provide using the enterprise GIS was aided significantly by the process of engaging with industry users and community groups. That process helped us to identify gaps and decide on the most valuable services to deliver with our new capabilities and, in turn, which apps we would use to achieve this end.

3. Quantitative and qualitative impacts
The efficiencies brought by the modernization – and the possibilities for going even further in the future – have exceeded our expectations.

Moving from silos to editing in an enterprise GIS environment has eliminated at least 20 steps from the process of getting information to the user who needs it.
With the old system, Racine County’s Real Property Lister faced at least a month of data manipulation to get information in order for a public-facing site. Today, edits are on the public facing website in less than 24 hours. Inter-departmental workflows mean that a deed can be recorded and the map changed in under a week. The public site used to be updated only once every quarter, resulting in information that was three months old by the time it reached users.

One of the most important results of the new GIS land records management system is that it’s not just making what we do better now. It has prepared us for the future and, for the first time with GIS, we have room to grow. Many more opportunities have been identified for the GIS – for example, extending it to create web maps and apps for other elected districts in the county, and school districts. No changes to the system are needed in order to seize these opportunities, so as time goes on the value of the system will only increase.

On the subject of value, the value of the information products we are able to produce with the new GIS has grown exponentially. Three-month-old data offers very limited value to any GIS use but, in contrast, data that is accurate within 24 hours and the immediate availability of all information related to a parcel of land, such as legal descriptions, is much more meaningful. The quality of our output has grown enormously as a result.

4. Effect on productivity
Our new GIS doesn’t mean less work for the County. Instead, it’s enabling us to produce much better results with the work that we do. There are no redundant tasks. Output has increased tremendously and is benefitting the public in a much more meaningful way. Since our core tasks have become significantly less labor-intensive, we are also able to be much more strategic with our time, focusing on doing even more with the new system.

Since spatial information is critical to many county functions, many business processes across the organization have experienced a positive impact on productivity. A spatial element has been added to information that previously had no spatial element, creating a more complete picture on which to base decisions.

But the impact of the new GIS on productivity extends far beyond the bounds of the county offices. Assessors are able to be more productive as they no longer have to physically go to the county offices to retrieve the documents they need to do their job. Realtors have the information they need at their fingertips, and are able to increase productivity by focusing on the substance of their job and reducing the search for information to a one-step task.

5. Other impacts
As a result of the new GIS implementation, both staff and the organization are benefitting from new and valuable skills. Racine worked with Pro-West, its private sector partner, to design and implement a custom training program that would arm Racine staff with the knowledge necessary to maintain all the configured IT software and hardware, and to maintain the parcel data. Training was carried out in person and online and covered ArcGIS Server configuration, SDE environment, ArcGIS Online application configuration, and three days of hands-on parcel editing training in the Parcel Fabric environment. This training has resulted in a team that is knowledgeable in the latest GIS technologies and techniques, elevating their skillsets,
enhancing employee engagement, and enabling them to add yet more value to their roles, departments, organization, and all the user communities served by the new GIS.

Based on the foundation that was laid in 2016, our county has since been able to add more “floors”, expanding our GIS even further across the enterprise to different departments and community user groups while continually improving the services it enables us to provide and the efficiency it affords our GIS staff, allowing them to forge ahead with value-generating tasks.

The county’s story has garnered the attention of Esri, which awarded Racine County with a Special Achievement in GIS (SAG) Award at the 2016 Esri User Conference in San Diego, CA. This award is given to organizations that have “used GIS to improve our world – and set new precedents throughout the GIS community”. Earning this award provided a huge motivational boost, and endorsement from the GIS fraternity that we are making best use of the technology available and are on the right trajectory with our plans for the future. This recognition is valuable as we seek to become more competitive and raise the profile of the county among citizens, visitors, and other government organizations in our region and further afield. Esri published this article about the project in the November 2016 edition of its ArcWatch publication.

We were accepted to deliver a session focused on the enterprise GIS transformation project at the 2017 Esri User Conference entitled “Racine County: A Unique Approach to Land Records Transformation”, as well as the Property Records Industry Association (PRIA) Annual Conference taking place in August. Earlier this year we also presented the project to delegates at the Wisconsin Land Information Association (WLIA) Annual Conference.

Such opportunities to share the results our County’s has been able to achieve is significantly increasing our county’s visibility within the GIS and land records industries and positively impacting our status as a competitive, progressive organization.

### 6. Changes to conducting business or delivering services
The new system has brought with it many positive changes in how we do business and deliver services, and in the quality of those services. Details of those changes are described above in sections E2, E3 and E4.

### F. System Resources

#### 1. Primary hardware components
The primary hardware components of the new GIS implementation were a web server (virtual server) and an application server (ArcGIS Server).

ArcGIS Server specifications:
• Windows Server 2012 R2
• 32 GB RAM
• 4 CPUs (2 virtual sockets x 2 cores per socket)
• C: Drive (OS): 50 GB
• D: Drive (Data): 500 GB

The web server is also on the ArcGIS server.

2. Primary software components
Software used to deliver Racine's GIS consisted largely of Esri products, combined with a number of non-Esri best-of-breed technologies and custom development by Pro-West & Associates to produce the GIS that would deliver the best service and greatest value for Racine's needs. Primary software utilized was as follows:
• ArcGIS Online + Open Data Portal
• ArcGIS Server 10.3.1
• Workgroup geodatabase with Local Government Information Model
• ArcMap
• Multiple web adaptors for internal and external access to ArcGIS Server
• Web AppBuilder Developer Edition 1.3 + custom widgets
• Custom ArcPy scripts for nightly data import
• Transcendent Tax Database with custom view to support GIS integration
• TriMin recorded documents system – integrated with GIS
• LandShark system – integrated with GIS

3. Data
The system uses feature classes from Esri's Local Government Information Model (LGIM) for general map services. Several nightly processes pull data from various systems within the county and produce additional feature classes that drive map services published for web application use. Specifically, the following data is incorporated into Racine's GIS:

• Tax information from the county's Transcendent system is joined from a view to the LGIM published parcel data to create a base parcel layer
• Foreclosure information from the Sheriff's office is copied from a Microsoft Access database and joined with the parcel data to produce a point layer of foreclosure locations.
• Tax foreclosure information is copied from an externally maintained spreadsheet and joined with the parcel data to produce a point layer.

4. Staff resources for implementation
The project was staffed jointly by Racine County and Pro-West & Associates. The specific staff resources involved and their FTE time across the entire project are indicated below.

Racine County

• Supervisor – 0.3 FTE
  o Racine County lead
  o Budget management
Racine County Enterprise GIS: URISA ESIG Award submission

- "Big picture" goal setting
- Planning
- Stakeholder coordination
- Team communication

- GIS Specialist/Analyst – 0.6 FTE
  - Racine County GIS lead
  - Maintain and manage project from GIS perspective
  - Develop standards, processes, and policies related to GIS
  - Implement new GIS applications
  - Coordinate with business partners
  - Coordinate staff training
  - Manage geospatial warehouse

- IT – 0.01 FTE
  - Infrastructure and server management

Pro-West & Associates

- Project Manager – 0.25 FTE
  - Contract administration
  - Project management
  - Budget and timeline management
  - Process change requests
  - Status updates

- Solution Specialist – 0.33 FTE
  - ArcGIS Online support and training

- Senior Developer x 2 – 0.2 FTE each
  - System architecture design
  - Security management
  - Database design
  - Replication
  - City/County coordination

- Geospatial Data Specialist, 0.25 FTE
  - Parcel fabric migration and training

5. Unusual resourcing

None.