2022 URISA ESIG Award Application
City of Plano Application

A. System
1. Name of system and ESIG™ category for which you are applying (Enterprise System or Single Process System). – ETRG Program Enterprise System
2. A letter from the executive administrator authorizing submission of the system application (letters must be signed and scanned). – Page 8 of this document
3. One (1) page, or less, summary of what the system accomplishes and why it is exemplary. – Page 9 of this document.
4. Three “user testimonials”. These testimonials should include the title of the system, the person’s name, job title (if relevant), a statement of what specific ways the system improves their work and/or the work of their organization, and how frequently they use the system (testimonials may be signed and scanned). – Page 10-12 of this document.

B. Jurisdiction
1. Name of jurisdiction – City of Plano
2. Population served by the organization/agency – 290,850.
3. Annual total budget for jurisdiction - $378.10 million
4. Name, title, and address of chief elected and/or appointed official –
   Mark Israelson
   City Manager
   1520 K Avenue
   Plano, TX 75074
5. Name, title, address, telephone, FAX, and email for contact person for system –
   Kristina Deitz
   GIS Analyst III
   1117 E 15th St
   Plano, Texas 75074
   P: 972-941-5370
   kdeitz@plano.gov

C. System Design
1. What motivated the system development? – The project was initiated by the City of Plano Fire Department staff who was looking for a faster way to collect and access pre-plan information (e.g. building access, fire equipment locations, etc.) in the field. Originally the Fire Department staff was using basic paper maps that only had buildings and streets to add on them the locations of fire equipment, building access, informational signs, hazardous materials, unit labels, etc. Below is an example of what the previous maps looked like.
This manual process was not only very slow but it didn’t allow for regular updates or tracking of the last update dates. The department was using large spreadsheets to track monthly building inspection assignments but the staff didn’t have access to attribute information such as the contact information of the building managers or personnel on-site. They were having to call dispatch for information while enroute. So, there was a need to get accurate information to the firefighters in the fastest way possible in the field.

2. **What specific service or services was the system intended to improve?** – This allows the firefighters and even other departments, such as the Police Department, access to this emergency-critical information. The mapping applications provide them with updated gate codes to access apartment complexes, contact information of any personnel on site, fire equipment locations on site, etc. Below is a screenshot of what the mapping application looks like now. With all of the point and polygon layers having access to click on and look at the attribute information such as the contact information, gate codes, descriptions, etc.
It also automates the process of assigning building inspections to be performed each month by the firefighters to ensure the data is getting updated on a regular basis.

3. **What, if any, unexpected benefits did you achieve?** – Developing the system has empowered our users to create and manage their own data. The GIS department won’t be responsible for data collection or massive amounts of data management. The apps and scripts that we’ve created do the majority of the work with many fail-safes in place, such as editor tracking and regular data backups. This automation frees up staff time and ensures consistency of the processes.

4. **What system design problems were encountered?** – This originated with an inspiration from an ESRI solution but it only included one web mapping application and did not allow for any user controls. We expanded the design to include multiple web mapping applications to control the editable fields, hub sites to serve as landing pages, dashboards to provide a high-level view of the data status, and Python scripts to manage building inspection assignments.

5. **What differentiates this system from other similar systems?** – We have placed more user controls into our system than others. The applications and editable layers are secured and only allow access to the authorized editors. The coordinators who review the data for accuracy are granted a different level of access so they can see more apps and edit more fields. We have also introduced specific fields to track the status of the data collection, such as a “Ready to Review” or “Ready to Publish”. This provides accountability and ensures the data is as accurate as possible, so the firefighters can rely on this information in an emergency situation when they need it the most. We have also customized the solution by creating scripts to automate multiple repetitive processes (e.g. monthly assignments, data updates, regular backups, and status emails).

**D. Implementation**

1. **What phases did you go through in developing the system?** – We started with creating the geospatial data from the Adobe PDF maps which took a significant amount of time for a Fire
captain on light duty to learn ArcGIS and enter the data. Once the data was created, custom
symbols were created to replicate those used on the previous PDF maps. Then, we developed the
ingediting apps to edit the GIS data and upload attachments such as photos or floor plans. We also
extended the scope to include dashboards to review the statistics on the data, as well as a central
hub to access all the web mapping applications. After a long collaboration between the GIS team
and Fire Department on an iterative process with multiple trial and error steps for managing the
edits and inspection assignments, we all felt confident that the final solution meets the needs.

2. **Were there any modifications to the original system design? Why? What?** – Because of the
span of this project, multiple GIS analysts worked on it and each built on and modified the
previous design to simplify the amount of behind the scene processes and minimize the risk of
failure. The structure/schema of the GIS data had to be altered multiple times, coded domain
values tweaked, web maps redesigned, and the app widgets reconfigured based on the customer
feedback.

E. Organizational Impact

1. **What user community does the system serve and how?** – This was specifically designed for
the Fire Department but the Police and Animal Control Departments have expressed an interest in
getting access and potentially contributing data as well. Because some of this information is
sensitive, it can’t be shared with the general public and is available to internal city staff only.

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.** – This GIS-based solution impacts the Fire Department and the
decisions made when responding to emergency situations. Having timely access to updated
information regarding asset locations and hazardous chemicals can save lives and can reduce
damage to structures and properties. The firefighters use this information enroute to determine the
best approach for addressing a particular emergency. Previously, they had to flip through papers,
sometimes splitting areas up across multiple pages just to get the full picture, and also call
dispatch for more information. Now everything needed can be quickly retrieved with a location
search and navigation on the screen. This is a screenshot of our ESRI HUB that we created that
shows access to the multiple Web Mapping Applications that we’ve created, our dashboards, the
Out of Service Fire Hydrants web map that has important information on what fire hydrants
aren’t accessible at this time, our static paper maps for those that still prefer that method, as well
as who to contact in case of questions.
3. **What were the quantitative and qualitative impacts of the system?** – This system improves several performance workflows that the firefighters use. Transitioning from paper-based maps and Excel spreadsheets to field maps and web mapping applications allowed for in-depth and regular asset updates, and the web maps showed not only correct asset information but also the latest underlying GIS data, such as streets or buildings that are constantly updated. The automation provided by the Python scripts ensures all assets are inspected as expected.

4. **What effect has the system had on productivity?** – The GIS-based solution is much more efficient than the previous manual processes. We’ve automated the system through Python scripting and even have placed priority on the higher-risk buildings or the assets that are due for re-inspection. The firefighters performing the field inspections don’t have to flip through hundreds of map pages to locate their correct area and make markups. They can find all the information they need, including the attribute information, and make edits directly to the GIS layers using a web mapping application.
5. **What, if any, other impacts has the system had?** – This will also benefit police officers on call as well as animal control officers. They may not necessarily need access to the same fire layers such as fire equipment, but it will help them find building access information and necessary contact information. We can anticipate this solution to evolve over time and include other layers to gather further important safety 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.** – Previously, the map books were paper-based having hundreds of pages to cover the entire city of Plano, which is approximately 72 square miles. Some areas, such as apartment complexes, were spanning multiple pages. Multiple map books had to be printed and they could not be re-printed as fast as the GIS data was updated, so the information they contained was mostly out of date. Using them in the field was cumbersome and made it difficult to read or mark up the changes as needed. The new interactive web mapping applications allow instant access to the most up-to-date data. In emergency situations, seconds can mean the difference between life and death or the amount of property damage. This also helps with dispatching the appropriate equipment and first responder crews (e.g. engine or fire hose size). You can see an example of the old vs new way in section C1 and C2 as well with the provided screenshots. You can see the difference in the same map and how much more up-to-date and informative the new way is.

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.** – The data is all stored in an enterprise geodatabase that is housed on a virtual server. The applications that make up the final solution run on laptops, cell phones, or tablets as needed.

2. **What are the system’s primary software components? Describe the primary software and, if a commercial package, any customizations required for the system.** – The primary software is ESRI ArcGIS Online. The GIS data is published to web services using ArcGIS Server and secured to allow access only to authorized users who are able to view or edit the data utilizing the ESRI web mapping applications, dashboards, and the hub sites that have been configured and deployed.

3. **What data does the system work with? List and briefly describe the database(s).** – We use one enterprise geodatabase that houses all the data. We created a dataset dedicated to this data which contains 13 different feature classes:

   a. Alarm Equipment Control Panels: alarm control panels such as the fire alarm panels, fire control rooms, communications control panels, fire pump control panels, etc.

   b. Boundary Lines: interior or exterior boundary lines, such as the existence of any walls that might block access.

   c. Building Access: access points for getting in and out of the building and what time of access it is (door, overhead door, etc.).

   d. Building Equipment: different types of equipment for the building such as transformers, dumpsters, heat/ac units, trash compactors, emergency generators, etc.

   e. Buildings: these are the building footprints themselves and it houses the contact information for the management of the building, any information about the building such as if it has a key box or a sprinkler system, and other pertinent information.

   f. Building Units: this point data is for labeling purposes, to label the locations of different units for the building. This helps them navigate quickly to the location in question if it is a specific unit number that is having issues.
g. Fire Suppression Systems: equipment to help extinguish fires (e.g., Fire Department connections, riser valves, etc.).

h. Hazardous Materials: hazardous materials such as chlorine, flammable liquids, pesticide storage, etc.

i. Key Boxes: this helps identify where any key boxes are located and help identify if it’s a gate code, what the code is, drug vault, padlocks, etc. This helps them access the facilities faster.

j. Miscellaneous Resources: any uncategorized resources that are helpful for the firefighters to know such as gas pumps, fire lanes, clearance heights, etc.

k. Outdoor Structures: these structures are in the locations of any informational signs that are outdoors that would be useful knowledge to know ahead of time.

l. Special Needs Locations: these are locations of any special needs that would be helpful information such as the manager’s office, nursing/senior living, etc.

m. Utility Shutoffs: these are the important utility shut-off locations for utilities such as gas, water, electrical shut off, etc.

All this location information is extremely important for the fire response teams. The more information like this that they can get ahead of time, the faster the firefighters can respond to an emergency. This can save lives as well as reduce potential property damage.

4. **What staff resources were required to implement the system? (i.e., report approximate staff and consultant time as FTE’s)** – This project has taken several years to complete. We worked with several Fire Department staff members such as fire captains, assistant fire chiefs, and field personnel for input and feedback on the GIS solution. During development, we went through GIS staff changes and had three different GIS analysts assigned to the project. Because of COVID, the work was placed on hold for a long time, so it took about three years to complete. The GIS staff invested an average of 20 hours per week and held multiple meetings to discuss the schema of the GIS data, brainstorm the plan for the final outputs, write the Python scripts, get input, research options, and implement the feedback provided by the Fire team.

5. **Comment on anything unusual about the resources used to develop your system, such as data, software, personnel and financing.** – This project brought the GIS and Fire teams together into an endeavor both teams were dedicated to and supportive of. One of our fire captains believed in this program so much that he invested a significant amount of time and effort to create the raw GIS data from the graphics on the old PDF documents. This and their active involvement along the way are clear demonstrations of how much they support this project and how beneficial it will be to their department and the organization in the long run.
June 6th, 2022

Georgeta Ungureanu  
**BI & GIS Manager**  
1117 E 15th Street  
Plano, TX 75074  
972-941-7242  
georgetau@plano.gov

To whom it may concern:

I am very pleased to authorize the submission of our ETRG solution application for the URISA ESIG Award. This work was a closed partnership between the City of Plano Fire Department and the GIS team in the Technology Services Department that resulted in developing a suite of web mapping applications to assist with pre-incident planning and ensure the appropriate response in emergency situations. The solution leverages ESRI’s ArcGIS Online technology to collect, manage, and display special hazard and tactical response information on interactive maps and dashboards that are accessible at any time and from any device, replacing outdated paper-based maps. These interactive, user-friendly maps combine the tactical response guide (TRG) data with aerial images to enable effective communication between all Fire Department personnel.

This project was developed in an agile method and, although it involved multiple staff members, Kristina had a very significant contribution to bringing it to fruition and deploying it to production. I strongly recommend you closely evaluate our solution to fully comprehend the value it adds to Plano’s public safety activities. One of the critical benefits of this GIS-centric solution may result in saving lives which I consider worthy of this award. Should you wish to contact me for more information or clarification, please email or call me.

Thank you for your consideration.

Sincerely,

Georgeta Ungureanu
The ETRG Program system was originally inspired by an ESRI solution that was 1 Web Mapping Application, allowing users to add and remove data as needed. This would allow them to start updating the data digitally and have access to everything at a much quicker pace than having to flip through many map pages. However, our end goal was to have more user control and allow for more tracking of who created/updated the data and when it was last reviewed. Our GIS team then began to expand on the original ESRI solution to build out into 3 different Web Mapping Applications, 2 different dashboards, and 1 HUB to access all the information.

We customized the fields to include information such as “Ready to Review”, “Ready to Publish”, “Approval Date”, “Battalion”, “Station”, and “Shift”. This allowed us to have our field guys who are adding the data in the field to track when their information was completed and ready for a 2nd set of eyes to review the data by marking the data Ready to Review. Then our Battalion Chiefs can review the data and mark it as Ready to Publish so that the information is finalized and good for use in the field. The Approval dates provide the information on when it was last reviewed. All this tracking has helped us to build out the system and better organize the data that is coming in.

The GIS team has built out python scripts in the background that run and analyze that data. We built out a giant script that helps track “assignments” each month to ensure that buildings are getting updated on a regular basis, with a priority on higher risk buildings and buildings that haven’t been reviewed in the longest amount of time. Then we also have a script that assigns a battalion and station to each new feature as it gets added to help split up the review process to the appropriate battalion chiefs. There is a script that sends out a list of new assignments and any assignments that are behind each month in a spreadsheet format to the battalion chiefs so that they know their crews’ assignments for the month as well as where they are behind.

The 3 Web Mapping Applications are broken down into the purposes of Viewing, Editing, and Reviewing. The Viewing Web Mapping Application shows the location of all the data currently in the database, symbolizing them by type of feature as well as if it has been reviewed or not yet. This allows them to have access to all the data but also puts a disclaimer on any data that hasn’t been reviewed by a Battalion Chief. The Editing Web Mapping Application is primarily used for editing in the field. This also has a filter to help them “Find my Assignment” for the month based on which station and shift they are working on. This will zoom to their specific building that they should be visiting for the month, and they can easily use that to navigate to and begin adding data. Then there is the Reviewer Web Mapping Application that allows for editing and reviewing all the data across all 13 layers that has been collected in the field. The filter they have allows them to narrow down all data that is ready to review based on their selected battalion, shift, and station. This will zoom to the feature that they are ready to review.

Then we have the dashboards that give the users a high-level view of where they are at in the month: how many assignments are waiting to be reviewed or edited in the field. This also provides minimal information on where the assignments are located and how they are spread out across the stations and shifts.

All of this has resulted in 1 enterprise-system that can be used across multiple departments. We have added better user control to allow for accountability, scripts to automate the processes, and a better user interface than the previous paper maps. This will all greatly help our fire and police departments in emergency situations and get that information into their hands in the fastest and most efficient way possible. Seconds literally matter in emergency situations.
Subject: ETRG Program

URISA Evaluators,

We feel our City of Plano Technology Services / GIS team is very deserving of the Exemplary Systems in Government Award. Multiple analysts worked on this project but Kristina Deitz played the final and most critical role in bringing it to fruition. She has spent countless hours on this project and has pivoted multiple times trying to find ways to improve the application and meet our needs. The ETRG Program has improved our fire department’s operations in the following ways:

The application provides critical life safety, hazard, access, and routing information to our crews in near “real-time”.

The ETRG Program allows our members to access information instantly on various mobile devices and platforms which is a vital requirement for first responders.

The ability to save and access occupancy-specific photos and videos using the application is a game-changer for our department.

The ETRG Program has allowed us to abandon our manual pre-planning process saving hundreds of work hours per year.

The application will allow us to pre-plan our remaining target hazards. Our previous pre-plan process was manual which resulted in less than 50 percent of our target hazards in the city being pre-planned.

Point-based data collected through the application has been utilized by other city departments allowing them to provide improved service to the citizens we serve.

If you have additional questions, please feel free to reach out. We cannot say enough about the efforts of our GIS partners and hope they are recognized for their outstanding work.

Sincerely,

Jeff Mobley
Assistant Chief – Support Services
972-941-5329
Date: May 31, 2022
Subject: Exemplary Systems in Government Award

URISA Evaluators,

My name is Alex Simmons, and I am a Battalion Chief in the Operations Section of Plano Fire-Rescue. I would like to explain why I think our Technology Services/ GIS Team is deserving of the Exemplary Systems in Government Award.

Our GIS Team, particularly Kristina Deitz, has spent countless hours working to develop our “ETRG” Program. Prior to the development and implementation of this program, Plano Fire-Rescue and Plano Police Department were reliant on paper maps and pre-plans for information. In many cases, our maps were riddled with outdated and inaccurate information. Because of the work of our GIS Team, we now have a robust, intuitive product that truly helps us deliver the highest level of service to our citizens in the safest manner possible.

The program is user-friendly enough to be used by all field personnel, yet powerful enough to be able to store and retrieve as much information as we need. This includes the ability to record videos and upload photos directly from the location into the program. Also, the program allows us to easily input and retrieve critical building and premise information using a variety of devices including Mobile Data Computers, iPads, and personal computers, so the information is always readily available.

Additionally, our GIS team has been able to create custom dashboards, assignment protocols, and delinquency lists. These items are viewed or sent to supervisors to be able to better account for the TRGs that have or have not been completed. These features are extremely helpful as they help us ensure that we keep the most current information without the need for a lot of human oversight.

Our team has worked tirelessly to take a standard product and make it into a program that not only meet the needs and requirements of Plano Fire-Rescue, but also the needs and requirements of Plano Police Department. Through their hard work, we have a program that affords us the luxury of almost “real-time” data at the tips of our fingers. For their hard work and dedication, we wholeheartedly contend they are deserving of the Exemplary Systems in Government Award.

Sincerely,

Alex Simmons
Battalion Chief
Plano Fire-Rescue
972-941-7159
Subject: ETRG Program

Dear URISA Evaluators,

Until recently, Plano Fire-Rescue only used paper Tactical Response Guides. With new rapid growth in our city we needed a way to adapt to our changing environment.

Our project coordinator, Kristina Deitz, was able to find resolutions and innovations for our needs. The first innovation/resolution was to turn our paper Tactical Response Guides digital. The Electronic Tactical Response Guide program was created. This program allows for more in-depth information to be collected and shared for our fire responses. This information gives our firefighters a tactical advantage. The second innovation/resolution was automating the assignment of ETRG updates. This automation greatly reduced the man hours used for assigning and checking for missed assignments, saving the department time and money. The third innovation/resolution was to create a hub for a one spot access point for all things ETRG. By creating this hub we can now access information on ETRG completion progress, due and overdue ETRGs, city fire response maps and a place for technical problems.

This new system is used daily and vital to the success and modernization of Plano Fire-Rescue. We are so appreciative of Kristina and her team’s work on these projects.

Sincerely,

[Signature]

Keil Baldia
Captain – Logistics
214-244-9837