A) System
   1) Name of system and ESIG™ category:
      - Interactive Pavement Maintenance Dashboard
      - Single Process Systems Category
   2) Executive administrator authorization:
May 29, 2020

Application for 2020 Urban and Regional Information Systems Association (URISA) Exemplary System in Government (ESIG) Award

City of Phoenix Street Transportation’s Interactive Pavement Maintenance Dashboard

Dear ESIG Review Team,

The City of Phoenix Street Transportation Department is pleased to submit this application for the Urban and Regional Information Systems Association (URISA) Exemplary Systems in Government (ESIG) Award.

The Street Transportation Department engaged in an intensive and sustained community outreach program to identify locations for pavement maintenance and to help determine the best use of $200M in accelerated funding to repair Phoenix’s road network over five years.

Phoenix is the fifth largest city in the United States with more than 4,850 miles of public streets in city limits. Typically, about $26 million is allocated to fund pavement maintenance per year. The Mayor and Council approved the $200M Accelerated Pavement Maintenance Program (APMP) to address street maintenance needs across the City. Because Phoenix was using taxpayer money to accelerate the street repairs, public involvement and engagement was a necessity and a priority.

GIS Tools Supported Public Involvement

The first step undertaken by the City was the development of a GIS Pin-drop map used to crowdsource information on problem areas throughout the city. Residents were able to drop a pin on this map to highlight various problems with the road surface. Nearly 7,300 pin drops were captured. This helped the team prioritize treatments and locations for pavement preservation work.

The department then published a GIS Story Map to educate the public on the paving program. This widely-used site describes the various pavement treatments, shows the approved APMP locations and reports on progress. The map is dynamic and is updated in real-time, allowing the City to demonstrate progress as each location is completed.

The GIS Story Map is an essential tool in showing our accountability and demonstrating progress to our residents. Now, when people call Council offices or the Street Transportation Department to ask about road repairs, we are able to walk them through the GIS Story Map to show them what is planned and what has been completed.
We believe this innovative use of GIS technology meets the very definition of Exemplary Systems in Government and is therefore worthy of recognition.

Sincerely,

[Signature]

Kini L.E. Knudson
Director
3) Summary:
   - The City of Phoenix’s Street Transportation Department has committed to open communication with the citizen taxpayers regarding the wise use of their resources. This Story Map, with inclusive dashboard, is just one of the many ways the Department meets that commitment.

   Our Web-based Interactive Pavement Maintenance Dashboard provides citizens with information on how we are applying funds, what treatments are being considered, when various repairs are scheduled, and where work has been completed. The story map and dashboard are additionally made available to our large Hispanic community in Spanish language format.

   Making this information accessible to the citizens in HTML5, device independent fashion, allows those curious about conditions, or planning their travel, the ability to see up to date status from wherever they have an internet connection.

   The Web GIS application is an essential tool in showing our accountability and demonstrating progress to our residents. Now, when people call Council offices or our department to ask about road repairs, we can walk them through the map to show them what is planned and what has been completed. We believe this innovative use of GIS technology meets the very definition of Exemplary Systems in Government and is therefore worthy of recognition.
Three “user testimonials”.

- **Name**: Ryan Stevens  
  - **Job title**: Civil Engineer III  
  - The Pavement Maintenance Dashboard improves the work of the Pavement Management team by allowing information to be quickly found and relayed to internal and external customers. Using the dashboard at public meetings and presentations allows for dynamic discussion about the pavement maintenance program which enhances transparency. Residents are able to see paving projects that are upcoming and completed, allowing the Department to educate the public of the amount of work done on the nearly 5,000 mile street network. Many times, Department leadership has been able to use the public-facing resource to answer questions to our City council offices directly, without the delay of routing the questions down to staff and back up the chain. The information is easy to see and comprehend, allowing for quick answers and less time by staff doing research. I use the Pavement Maintenance Dashboard at least once per week. Most often I use it in the field to check on completed projects.

- **Name**: Robert Walsh  
  - **Job title**: GIS and Data Manager (Senior Information Technology Specialist)  
  - The interactive Pavement Maintenance Dashboard is used daily by internal staff, management, Council and the citizens of the City of Phoenix to view recently completed and scheduled pavement projects. This saves the GIS, Pavement Engineering and PIO staff enormous amounts of time it would take to answer these questions through other means. It is a easy to use dashboard that allows the end user to query the map and get answers to their questions. It is also available in Spanish. The dashboard is available 24/7 for public consumption and it always in use.

- **Name**: Sasha Perez  
  - **Job title**: Management Assistant II, Office of the Director  
  - In my role with the city, I oversee constituent relations between the City Council offices and members of the public who call to ask about paving projects or to report maintenance issues. I use the Interactive Pavement Maintenance Dashboard several times per week, if not daily, to share information with the public, outside contractors or Council Offices. Before this GIS tool was in place, I would have to reach out to multiple staff people and wait for a response. Having this automated, interactive system allow me to be much more responsive to members of the public and elected officials. I am pleased to offer this testimonial in support of the Urban and Regional Information Systems Association (URISA) Exemplary Systems in Government (ESIG) Award

**B) Jurisdiction**

1) Name of jurisdiction
   - **City of Phoenix – Street Transportation Department**
2) Population served by the organization/agency
   - **2 million plus**
3) Annual total budget for jurisdiction
   - **FY 19-20 Operating budget: $109,809,000**
4) Name, title, and address of chief elected and/or appointed official
   - **Kate Gallego, Mayor, Phoenix City Hall, 200 W. Washington Street, Phoenix, AZ 85003**
5) Name, title, address, telephone, FAX, and email for contact person for system
   - **Curtis Pulford, GIS Coordinator, 200 W. Washington Street, Phoenix, AZ 85003, 608-219-9291, curtis.pulford@phoenix.gov**

**C) System Design**
1) What motivated the system development?
   - The primary motivation was citizen engagement and communication. Secondary, though only minimally, was improved information and communication across the Department’s various sections related to planning, operations, and reporting.

2) What specific service or services was the system intended to improve?
   - Prior to development of this ‘new’ service, citizens and City Council offices would call the Department for information regarding this work. Those calls would often be routed and re-routed until someone could find the information in lists or spreadsheets. Putting the information in one real-time access location improves that process significantly.

3) What, if any, unexpected benefits did you achieve?
   - City Hall and our City Council have frequently promoted the application in community newsletter and through social media. There has been a very positive response. And, through both English and Spanish language versions, we have seen more than 30,000 visitors.
4) What system design problems were encountered?

- Story maps work fine on multiple platforms, but dashboard frames and widgets do not resize as well. We wanted all the pieces of this application (story map pages, and dashboard controls) to work well for folks from large home or public library desktops, or on their much smaller smartphones. To satisfy both audiences we had to configure two different versions of the dashboard, to display the same functional information in both large and small formats. A toggle within the dashboard switches views as needed.
5) What differentiates this system from other similar systems?
   - As the 5th largest City in the United States, we are somewhat unique in the size of our intended audience. We also have a largely English as a Second Language population to serve. And thirdly, this application combines the best of both Story Maps and Information Dashboards together.

D) Implementation
1) Development Phases?
   - Data is always key, and it was of critical importance for this application. We first developed the schemas, domains, and Active Directory permissions. We wanted real-time field data, from authorized sources; and we wanted it standardized through domains for standardized reporting.
   - For the application shown, we did iterative development – based on feedback from our Community Engagement team, Pavement Maintenance team, and Management. We then staged to internal Development servers for testing, and finally created the public-facing version on our enterprise (City of Phoenix) Production Servers.
2) Modifications?
   - Our decision to create a Spanish language version, came near the end of development. This required that all verbiage in story map, instructions, and desktop and mobile dashboards, needed to be translated by professionals originally not part of the development. And while this took some extra time, we feel the results were very worthwhile.

E) Organizational Impact
1) What user community does the system serve and how?
   - As mentioned previously, this application serves the entire driving population of metropolitan Phoenix (3M city, 5M metro). It is also useful to commercial transportation users. And it is vital to many of our Department’s work Sections. By providing real time information on what roads are scheduled for repairs, and which roads are newly resurfaced the travelling public is better informed on transportation options and additionally, they are able to see exactly where their tax dollars are being spent. Internally this application eliminates much of the previous confusion surrounding planning and scheduling, and allows all staff to see identical views of this information in real-time
2) What decisions/operations/services being affected?
   - Affected Services include: Overview of a very complicated Pavement Maintenance program, FAQ’s, a map dashboard and instructions on usage. This saves time and energy for numerous employees previously answering users one by one. This provides more consistent and uniform messaging, and provides up to the minute reporting
   - Affected Operations include: Jurisdictional and Utility coordination – By making planned work available well in advance of our operations, those utilities, agencies and jurisdictions also planning work are better informed and better able to communicate conflicts and scheduling issues. This often prevents a roadway being closed twice for work that can be co-scheduled.
   - Affected Decisions include: Planning and Scheduling – making this information easily accessible has improved relations with the affected citizenry and their Council District representatives. Through Council we now receive suggestions on project extents and Thank-You notes for work completion and scheduling.
3) What were the quantitative and qualitative impacts of the system?
   - Qualitative data includes the progress towards our goals, and representation by Council District affected, Status, and/or Treatment
Quantitative reporting on exact locations, mileage, date and treatment is available through either the map or the project list.

4) What effect has the system had on productivity?
   - The goal of our Accelerated Pavement Maintenance Program is to do three times more paving than in previous years. So far, we are meeting and exceeding that goal and the citizens and Council are thrilled. This application is a key piece in that success – as it helps us avoid conflicts, improve our productivity, and keep all affected stakeholders in the know.

5) What, if any, other impacts has the system had?
   - The wide success of this system - as seen in the Street Transportation Department, and by the enterprise City of Phoenix – has had a very positive influence on how GIS, story maps, and dashboards can contribute to our successes. We are now being asked by multiple program areas for help integrating with GIS - instead of asking them how GIS might help.

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 all the information communicated through this application was held in spreadsheets – by the planning, and operations sections. Communication to affected citizens was done via a dedicated phone.
number. Communication to management and City Council was done through Word.doc reporting on a seasonal basis.

- This system puts all data into a better coordinated and managed relational database and communicates activities to all affected parties in real-time.

F) System Resources

1) Primary hardware components?
   - The City of Phoenix is a very large IT enterprise with a complex system of networks and various technology needs for its more than 14,000 employees. The hardware that this system leverages sits within this shared, virtualized computing infrastructure, and aligns with the City’s “data center infrastructure-as-a-service” reference architecture. Details can be provided if needed.

2) Primary software components?
   - ESRI’s AGOL Story Map and Dashboard services construct the User Interface.

3) What data does the system work with?
   - SQL Server functions as the data backbone for the system. We have various relational tables, editable per Active Directory permissions, that reflect planning and implementation sections work.

4) What staff resources were required to implement the system?
   - Data schemas required weekly meetings and development by a team of 3 (manager, developers). As this was one of many projects, actual time spent is hard to estimate, but we might guess 4-8 hrs/wk over about 12-16 weeks. Application development similarly is hard to estimate. One developer (GIS Coordinator) worked on this between coordinating the work of all the other Asset Location Systems GIS staff. Time spent was again 4-8 hrs/wk, this time over a shorter 8 wk period. Those 8 weeks included development review meetings, every two weeks, with a team of 10 – 15 program, division, and department management to validate concepts and development.

5) Comment on anything unusual about the resources used to develop your system, such as data, software, personnel and financing.
   - The most unusual resourcing, not mentioned in #4 above, were the translation services for converting all text (story maps, map legends, map attributes, dashboard frame naming, etc.) in the system from English to Spanish. We first had to capture all the English text, then use it to create the left side of a side by side text translation. The city’s representative for this, sent it back with the right side of the list (each item) translated for our re-insertion into duplicate Spanish Language systems.