Virginia Association of Counties
ACHIEVEMENT AWARDS

VACo — Virginia Association of Counties

APPLICATION FORM

All applications must include the following information. Separate applications must be submitted for each eligible program. **Deadline: June 1, 2018.** Please include this application form with electronic entry. If you do not receive an email confirming receipt of your entry within 3 days of submission, please contact Gage Harter.
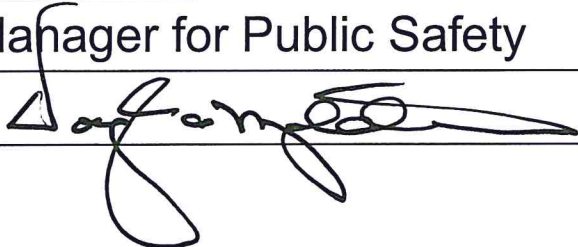
PROGRAM INFORMATION

County: County of Henrico

Program Title: Improving Snow Plowing Operations with Mobile GIS

Program Category: Information Technology

CONTACT INFORMATION

Name: Victoria Davis

Title: Management Specialist

Department: County Manager's Office

Telephone: 804-501-4276   Website: henrico.us

Email: dav127@henrico.us

SIGNATURE OF COUNTY ADMINISTRATOR OR DEPUTY/ASSISTANT COUNTY ADMINISTRATOR

Name: Douglas Middleton

Title: Deputy County Manager for Public Safety

Signature:

3

1. **Program Overview**

The Henrico County Department of Public Works (DPW) maintains its own secondary road system, and, therefore, is responsible for all its maintenance needs. DPWs snow removal program recently went paperless, using Geographic Information System (GIS) as the system of record for tracking the snow removal efforts and the subsequent issues that arose from infrequent plowing damages. The innovative system allows for dispatchers to communicate directly with individual foremen for rapid response or other special needs. Additionally, the system provides real-time, visual reference to aid executive and senior staff in decision making. This GIS system was created at virtually no additional cost. The foremen used county issued tablets, smartphones, and ruggedized laptops with GIS functionality enabled by the county's Enterprise Licensing Agreement with ESRI. Immediate successes included eliminating paper copies, having instant access to statuses of all snow removal equipment and plows, reducing costs associated with traveling out of the office during storms for inspections, tracking downed utility lines and other hazards impacting travel, and providing readily available documentation for risk management damage claims. In addition to being implemented at virtually no added cost during a time of ongoing budgetary constraints, the system provides instant information at our fingertips and allows employees to make informed and prudent decisions. This can all be accomplished any place where there is internet connection. Our citizens and organization are much better served with this low-cost, time saving application.

2. **Problem/Challenge/Situation Faced by Locality**

The Henrico County Department of Public Works, as part of its Inclement Winter Weather goals, works 24/7 until we achieve bare pavement conditions on all our major arterials, minor arterials, major collectors, and minor collector roads. This may include chemical applications or

physically removing the material with plows. To help meet this goal, the Public Works department routinely activates a call center for our citizens to call with snow issues. The process of the complaint making its way through the system from the call center representative to the person on the ground doing the work could be a complicated and sometimes repetitive endeavor. Additionally, issues that originate from outside of the call center, even from internal staff, could get addressed by more than one person during the event. Time also becomes a factor in these events, as medical transport and other public safety personnel are impacted during inclement weather. Information would pass from paper to paper, to spreadsheet, to email, to paper, to lamination, and then to the foreman to make corrections. This extended the amount of time to respond to issues and used a large number of materials.

The DPW maintenance division and the GIS manager identified GIS as a potential solution to reduce paper usage and increase communication during snow removal events. The existing chemical application routes layer in GIS provided a starting point for arranging all plowing areas, and adaptation of ArcGIS Online by other departments provided insights into how DPW could use this technology.

3. **How Program Fulfilled Awards Criteria**

Technology is ever costlier, and adaptations of new technology in local government can be understandably conservative in both time and materials. Using GIS for the snow removal efforts was not new; however, using the same datasets and maps in a mobile environment was. The jump from using paper to going digital required a small learning curve, but many staff were eager to use their mobile devices in this new application. The department found success in minimizing the number of staff in the field during severe weather, and by providing documentation to risk management, that reducing the county's liabilities.

4. How Program Was Carried Out

DPW decided to use GIS to create this system. Staff used mobile devices (tablets, smartphones, and ruggedized laptops) along with ArcGIS Online (AGOL) and the ESRI Collector application to transmit data between the administrative offices and the foremen scattered throughout the county. This permitted us to:

- Enter, track and view request/ complaints in real-time and avoid duplicating responses.

- Create GIS subdivision layers with foreman information and chemical routes.

- Develop methods to symbolize subdivision routes to determine their status at a glance.

- Maintain records of all snow-related activity in subdivisions (plowing, spreading chemicals, citizen request/complaints, number of trips into subdivision, and any special notes for workers).

- Provide a mechanism for reporting snow storm -related damage by county equipment.

- Using the new system, a call center representative will enter the complaint instantly on the map with the citizen's information. That complaint can be viewed and instantly acted upon in the field, without the additional steps formerly involved.

5. Financing and Staffing

The County of Henrico holds an Enterprise Licensing Agreement (ELA) with ESRI that is funded through the Department of Information Technology for general use throughout county agencies. By using the ELA, DPW virtually eliminated any materials or software costs. Foremen already possessed tablets or smartphones for their general work requirements, so no additional costs were incurred related to this equipment. The entire project was done without consultants or any outside help, so there was no extra costs involved with staffing. We strive to be fiscally responsible and reducing costs to nearly zero proved the value of the program from the beginning.

6. Program Results

Immediate benefits of the program included the following:

- Elimination of paper records of complaints/work orders.

- Reducing errors and eliminated duplicate work requests.

- Improved communication between field and office staff.

- Reducing travel and associated operating costs. We now can get reports from the field, often with attachable images that are essential to risk management issues.

- Saved time/costs associated with re-treatments and damage complaints. By seeing our progress visually, we can instantaneously divert, or re-assign resources as needed.

- Graphical visualization of plowing status and complaints aided decision-making by executive and senior staff.

- Time delays from status reports are eliminated as information is provided in real time.

7. Brief Summary

The Henrico County Department of Public Works (DPW) maintains its own secondary road system, and, therefore, is responsible for all its maintenance needs. DPWs snow removal program recently went paperless, using Geographic Information System (GIS) as the system of record for tracking the snow removal efforts and the subsequent issues that arose from infrequent plowing damages. The enhanced system allows for dispatchers to communicate directly with individual foremen for rapid response or other special needs. Additionally, the system provides real-time, visual reference to aid executive and senior staff in decision making. This GIS system was created at virtually no additional cost. The foremen used county issued tablets, smartphones, and ruggedized laptops with GIS functionality enabled by the county's Enterprise Licensing Agreement with ESRI. Immediate successes included eliminating paper copies, having instant access to statuses of all snow removal equipment

and plows, reducing costs associated with traveling out of the office during storms for inspections, tracking downed utility lines and other hazards impacting travel, and providing readily available documentation for risk management damage claims. In addition to being implemented at virtually no added cost during a time of ongoing budgetary constraints, the system provides instant information at our fingertips and allows employees to make informed and prudent decisions. This can all be accomplished any place where there is internet connection. Our citizens and organization are much better served with this low-cost, time saving application.

Improving Snow Plowing Operations with Mobile GIS