



## SUBMISSION FORM

All submission forms must include the following information. Separate submission forms must be turned in for each eligible program. Deadline: July 1, 2024. Please include this submission form with the 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: ROANOKE COUNTY

Program Title: TOWN OF VINTON STORMWATER OUTFALL MANAGEMENT APPLICATION

Program Category: INFORMATION TECHNOLOGY

### CONTACT INFORMATION

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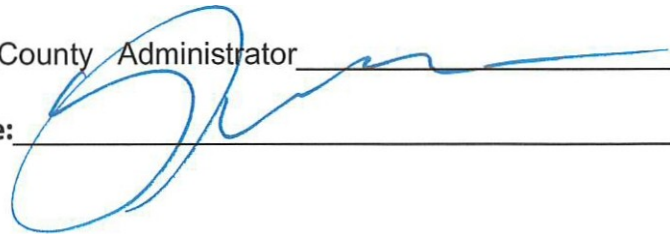
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### SIGNATURE OF COUNTY ADMINISTRATOR OR DEPUTY/ASSISTANT COUNTY ADMINISTRATOR

Name: Richard Caywood

Title: County Administrator

Signature: 

## **EXECUTIVE SUMMARY**

The **Town of Vinton's Stormwater and Outfall Management Application** solution, created in cooperation with Roanoke County's Information Technology GIS Team, effectively allows the Town's field personnel to move away from time-consuming paper document entry to a dynamic FieldMaps application using web services to collect data. This innovative application was created using the Esri ArcGIS for Enterprise platform and ArcGIS Online services for the customized web template and local proprietary information. Using a cellular-connected tablet or phone to access web services makes field data collection easier, faster, and more accurate.

## **THE PROBLEM OR NEED FOR THE PROGRAM**

The Town of Vinton Stormwater Management team previously used printed PDF documents to take into the field to track, evaluate, and document any outfall or stormwater issues. This often proved to be challenging due to weather conditions, complicated forms, and subsequent data entry upon returning to the office. Even with the best of care, the forms could become damaged, illegible, and transcription errors were always possible when transferring data back in the office. The number of outfalls requiring inspection varied daily and the increased number of multi-page forms added to any data-related collection issues. The Town needed an effective and modern way to collect data remotely from the field efficiently while storing the information to make it available for statistical tracking.

## **DESCRIPTION OF THE PROGRAM**

The County of Roanoke Information Technology's GIS Team maintains parcel outlines, address data, street centerlines, and zoning data to create the foundation of GIS services in the county. This approach ensures data consistency across the county's various departments and public-facing GIS applications. GIS Services was able to leverage Esri's ArcGIS for Enterprise Platform technology to integrate this GIS foundation with data from both legacy in-house systems and third-party commercial services to provide a single point of reference for all Roanoke County Information. Through a cooperative partnership, Roanoke County GIS Services assists the Town of Vinton with GIS software and technology support and maintains the Enterprise database features necessary to showcase the Town's features within cross-jurisdictional web applications.

The Town of Vinton was interested in modernizing its stormwater inspection process to make inspections easier and more efficient, especially for new employees not familiar with the program's legacy paper workflow and regulatory requirements. Roanoke County Information Technology's GIS Team took the lead in developing an innovative application and process to accomplish this goal. By leveraging existing parcel, address points and existing digital stormwater information, the application utilizes the Esri FieldMaps mobile application and an Enterprise Portal web map containing stormwater features, legacy outflow data, and other necessary information that allows the application to update each feature's data from the field remotely using cellular or Wi-Fi connected devices.

Using FieldMaps' cascading inquiry methodology, more data can be collected if it satisfies the embedded logic, using the Esri programming language Arcade, to open more data prompts when needed. As the inspector enters data, through drop-down menus or keypad entry, more questions or data entry queries become visible to increase the detail about the feature, while storing all relevant information to the Enterprise GIS database as it is collected from the field. If an outfall is damaged or other issues are noted, the inspector can submit pictures through the device's camera, and attach these pictures to the captured data. If water samples need to be analyzed by a lab, the results and lab report can be attached to a stormwater feature within the app to consolidate all data collected about a particular stormwater feature. This approach efficiently combines old and new data into a consolidated database, rather than using a collection of multiple documents and manual entry methods. When the inspector places a new stormwater feature or edits a previously created feature, the underlying Arcade script searches out the nearest parcel, captures the ParcelID, and creates a unique identifier, called a GPIN, which is derived from the latitude and longitude of the point. These values make the outfall points easier to locate for future inspections and allow for spatial mapping within the GIS platform.

Using ArcGIS Pro, stormwater inspectors or the Town of Vinton's Planning staff can revisit inspectors' work to view the results of the daily inspections and edit the features to include any data missed or later acquired, such as lab reports for water samples. Users can also attach other documentation to the feature and examine any images taken in the field. All data, documents, and images are consolidated and safeguarded within the database.

The total one-time start-up cost, which includes design, development, and configuration for the Town of Vinton Stormwater Outfall Management Application is \$6,200. The only project cost in developing the application is personnel time, not including the County's investment in the overall GIS Enterprise infrastructure. The project's cost includes staff hours needed to create & modify the schema for the feature, integrate the data from both localities, create the FieldMaps application framework, and develop the Arcade-based logic to run both the spatial geoprocessing tasks and cascading inspection questions. As part of the County's overall GIS Enterprise infrastructure, the Esri Small Government Enterprise License Agreement is \$55,000. The ELA provides unlimited access to ArcGIS for Enterprise software along with technical support from Esri.

The FieldMaps application and data service have increased the efficiency of the Town's ability to manage stormwater outfalls and collect necessary data on each stormwater feature. The cascading logic of the app's digital form greatly reduces the time needed to perform inspection tasks while out in the field. The Town of Vinton has recently reported that the original field survey time was approximately 1 hour per outfall, which included taking measurements and filling out the paper data sheets. Once the application was implemented, the inspection time per outfall was reduced by an estimated 50%, allowing staff to cover more outfall structures in the same time frame. This increase in efficiency has prompted the Town to re-evaluate its existing procedures for data collection for conversion into a digitally reactive format.

The Town of Vinton Stormwater Outfall Management Application greatly increases the efforts of its field inspectors, not only in data collection but also with data integrity as

there are fewer errors due to the app's logic and drop-down responses versus handwritten notes that have historically been transcribed in the office. The ability to access, edit, and store the data from the field, combined with the flexibility to update data as needed with relevant documentation and photographs, makes the inspection process more secure while consolidating data into one location. This "single data source" allows staff to access the data for required reporting without having to sort and crossmatch handwritten documents.

The innovative application shows the power of collaboration between jurisdictions using shared technology. Roanoke County Information Technology's GIS Services' in-house approach to development makes it easier to adapt the app's functions to meet the Town of Vinton's needs, but our process also gives us the knowledge to rapidly train new employees on how to best use the new app. The use of GIS technology also makes it easier for staff to reevaluate procedures over time and make any changes to the app to further increase the efficiency of the Town of Vinton's Stormwater Management team.