Virginia Association of Counties
ACHIEVEMENT AWARDS

SUBMISSION FORM

All submission forms must include the following information. Separate submission forms must be turned in for each eligible program. **Deadline: July 1, 2023.** 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

Program Title: GloFiber Illumination Areas Web Application

Program Category: Information Technology

CONTACT INFORMATION

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SIGNATURE OF COUNTY ADMINISTRATOR OR DEPUTY/ASSISTANT COUNTY ADMINISTRATOR

Name: Richard Caywood

Title: County Administrator

Signature: Richard Caywood

Digitally signed by Richard Caywood
DN: cn=Richard Caywood, o=Roanoke County, ou=County Administration,
email=rcaywood@roanokecountyva.gov, c=US
Date: 2023.07.05 10:56:07 -04'00'

EXECUTIVE SUMMARY

Roanoke County's Glo Fiber Illumination Areas web application helps bring transparency about the implementation and construction of fiber-optic based internet infrastructure by displaying the ongoing work on an easily viewable map.

The application informs the citizenry of Roanoke County about the propagation of fiber-optic based broadband, especially to normally unserved or underserved areas. Citizens and staff have quick access to the information which can reduce the number of phone calls and emails for staff.

Overall, the visual approach makes the information more accessible versus having citizens and staff comb through multiple spreadsheets to find information related to installation on a particular street. To that end, the application has been viewed 4,279 times over the course of the last 10 months.

The Glo Fiber Illumination application also shows the power of collaboration by using GIS technologies to combine third-party data, as well as in-house systems used by GIS Services staff. The utilization of GIS technologies also offers Roanoke County the ability to provide a consistent experience across the entire public-facing platform.

Please click on the following link to launch the Glo Fiber Illumination application:

https://gisweb.roanokecountyva.gov/glofiber/

More information about the County's rural broadband initiative, can be found here:

https://www.roanokecountyva.gov/2802/Roanoke-County-Rural-Broadband-Initiativ

BRIEF OVERVIEW

Roanoke County's Glo Fiber Illumination Areas web application is a solution which displays the growth of fiber-based broadband internet within the County and the Town of Vinton. This application allows citizens to track the propagation of this new broadband technology and view construction activities in their neighborhoods. This app, and process, was created using the Esri ArcGIS for Enterprise platform for the ease of use and services for the customized web template; local proprietary information; Python, for the robust scripting environment to process the daily data; and ArcGIS Pro for the geoprocessing tasks to transform the data for final consumption.

The application website, found at https://gisweb.roanokecountyva.gov/glofiber/, is a very simple and intuitive method to show where work has been accomplished and where it is currently underway. The website is refreshed daily, provided work is underway, and often has weekend projections.

PROBLEM/CHALLENGE

Through the course of the County's Broadband Initiative, tracking up-to-date work orders and locations was not very transparent. While the areas of development were identified and displayed, the actual work on the ground was not self-evident until a work crew was located on the street. Through their ongoing development of infrastructure across the county, Glo Fiber supplies a daily spreadsheet with street locations and work dates to the County for distribution. While this does lend itself to a more transparent statement of work, it is not an easily accessible solution.

PROJECT DESCRIPTION

GIS Services staff maintains parcel outlines, address data, street centerlines, and zoning data to create the foundation of GIS services in the County of Roanoke. This approach ensures data consistency across the County's various departments and assorted 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, providing a single point of reference for all information.

County Administration desired a solution that would provide citizens the necessary information about ongoing construction activities in an easily accessible way. To accomplish this goal, GIS staff developed an application that would provide a more visually-pleasing display of the information. Leveraging the existing parcel and address information, as well as the embedded quick search included across all GIS applications, GIS staff applied a Python scripting routine to process the daily spreadsheet, extract the necessary information, match data to existing features, and load a table within a file geodatabase. The development took approximately a week and a half to create a streamlined geoprocessing methodology, a lightweight python script and the configuration of an off-the-shelf application with the

addition of the County's embedded quick search. Once this overall strategy was set up, the daily

processing is minimalized and can be undertaken by a single employee with minimal training as the tools

are localized either within ArcGIS Pro or the python interpreter.

The largest processing need is the cleanup of the initial data. While the python script can make certain

determinations, based on existing County data, the original spreadsheet does require some manual

work, including spelling corrections, street name structural modifications and occasional removal of

non-jurisdictional streets to make it digestible by the script. Once this is accomplished, the processing

takes very little time.

Using tools within ArcGIS Pro, the imported data is transformed in a series of geoprocessing tasks to

populate a published feature layer which drives a web map located on the County ArcGIS Portal. The

web map is consumed by the web application and visually displays the shaded Glo Fiber construction

areas. This allows citizens to enter their address into the County quick search that is embedded into the

application, which was previously developed to utilize the address point and real estate parcel

information, and produce a pop-up displaying the address, construction date, neighborhood, and

magisterial district.

The goal of developing the Glo Fiber Illumination Areas web application was to make the ongoing

infrastructure construction transparent to citizens by providing up-to-date information that was readily

and quickly accessible.

OBJECTIVES

Objectives included the following: 1) Create a system whereby the data transferred from Shentel/Glo

Fiber via Excel spreadsheet can be processed quickly and easily with minimal input from the user

through Python scripting, 2) Utilize the power of ArcGIS Pro to create a methodology and use it to

process the incoming data, and 3) Furnish the output data to an easily navigable web application where

the public can track the process of the installation of the fiber network throughout the County.

COST AND STAFFING

The total one-time start-up cost which includes design, development and configuration for the Glo Fiber

Illumination Areas Web Application was $2,400. The only project cost in developing the application is

personnel time, not including the County's investment in the overall GIS Enterprise infrastructure.

Approximately 60 hours were needed to develop the python script, configure the website to accept the

feature service and develop the geoprocessing methodology to run the necessary tasks for processing

the data. There is a daily cost of up to one-hour of personnel time for data cleanup and processing of the

incoming spreadsheets, though that is largely nominal considering the alternative of manually

configuring the table daily.

As part of the County's overall GIS Enterprise infrastructure, the Esri Small Government Enterprise

License Agreement is $50,000. The license provides unlimited access to ArcGIS for Enterprise software

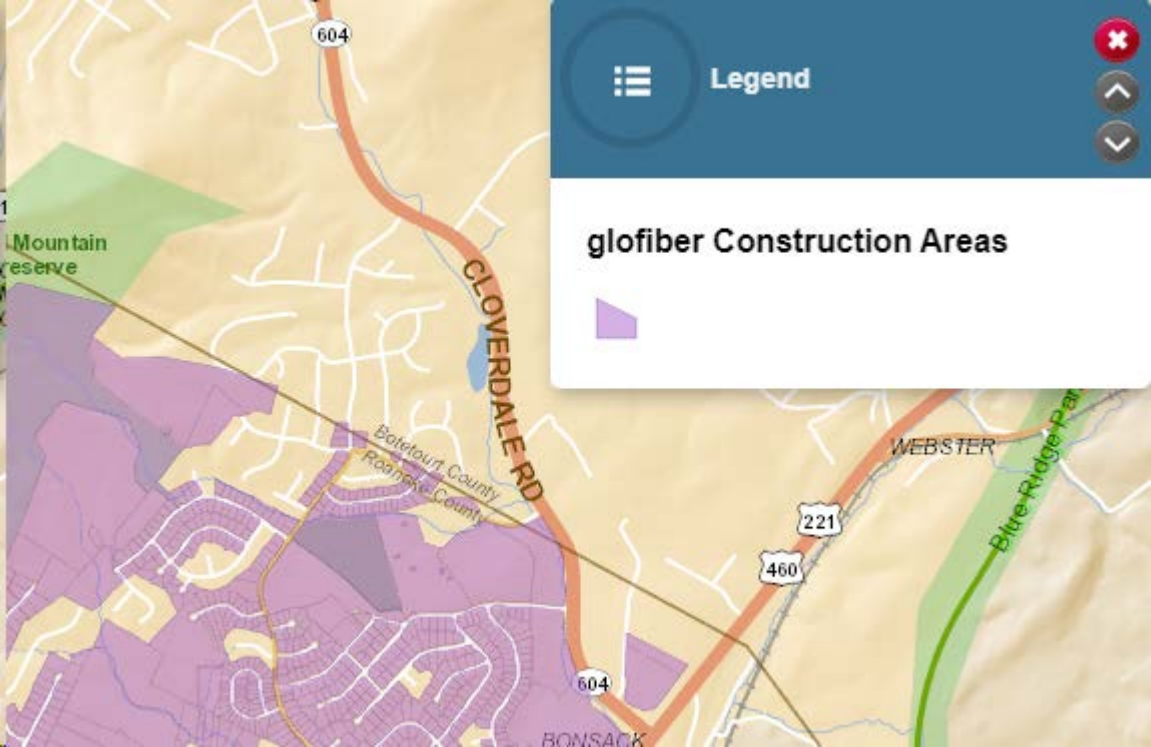along with technical support from Esri.

RESULTS:

The web application, created feature service and the procedure to process the information are a far

better way of providing transparency to the citizens as this part of the infrastructure moves forward.

Through the power of python scripting, the table processing reduces the time to seconds, rather than

tens of minutes for staff to split multiple, differently annotated or incomplete entries into individual

pieces. There can be up to 40 or more street construction jobs that translate to over one hundred

individual table entries. The geoprocessing tasks further reduce the time needed by staff to process the

data and does not require extensive training for staff to do so.

By utilizing the Esri ArcGIS Enterprise platform and a customized web template, citizens can effortlessly

access and query both current and past Glo Fiber infrastructure installation data via a web application,

saving time and relieving staff from answering street progress inquiries.

SUPPLEMENTAL MATERIALS

See the attached materials

glofiber Construction Areas

Search

Legend

glofiber Construction Areas

Craig County
Roanoke County

Botetourt County
Roanoke County

Carvins Cove

311

220

654

115

11

604

221

460

Havens Wildlife
Management Area

Havens Wildlife
Management
Area

419

117

101

460

220

221

112

11

Salem

460

460

11

Roanoke

460

11

Vinton

635

651

81

647

460

220

419

11

81

221

116
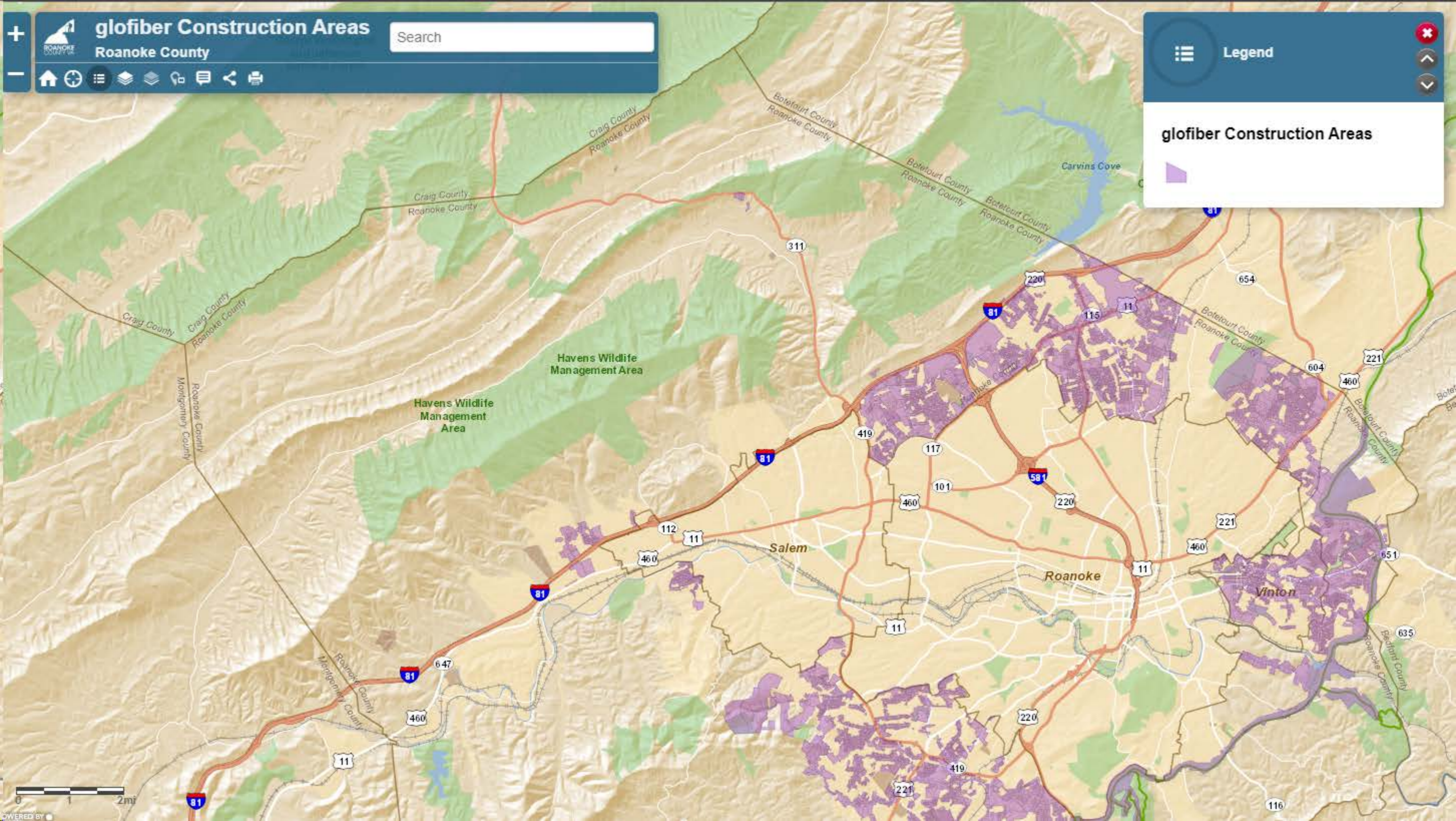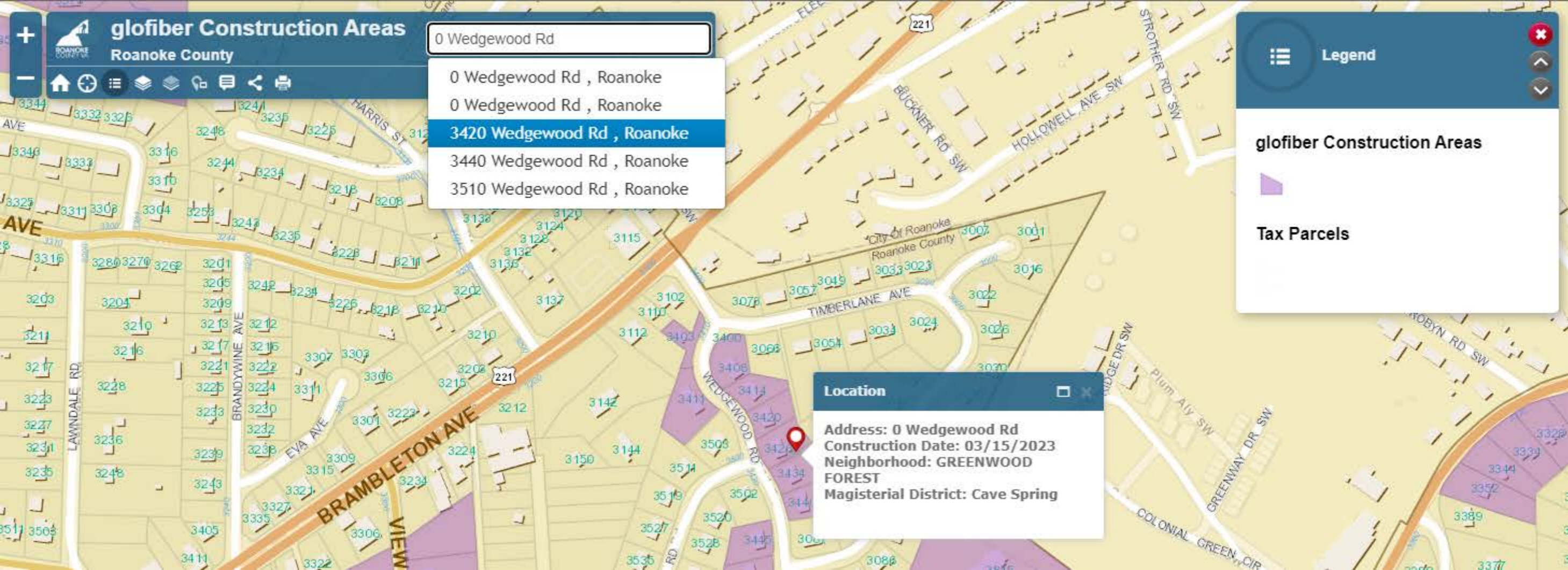
STREET ADDRESS/INTERSECTION	MARKET	Project Number	LCP/BB Number	LCAMS Ticket #
Hollowdale Dr	SALMVA	PRJ51-03594	LCP.234	N/A
Garst Cabin Dr	SALMVA	PRJ51-03594	LCP.234	N/A
Colonial Ave	SALMVA	PRJ51-03589	LCP.220	N/A
Bruhma	SALMVA	51-03374	LCP.204	N/A
CASTLEROCK	SALMVA	51-03373	LCP.253	N/A
SEDGEFIELD RD	SALMVA	51-03590	LCP.223	N/A
PINE ACRES LN	SALMVA	51-03380	LCP.228	N/A
PENN FOREST BLVD	SALMVA	51-03380	LCP.228	N/A
GARSTVIEW CIR	SALMVA	51-03596	LCP.232	N/A
BUSH DR	RONKVA	51-03559	LCP.462	N/A
OLD LOCKE DR/WERTZ ORCHARD RD/CAVALIER DR	SALMVA	PRJ51-03378	LCP.224	N/A
WOODTHRUSH DR/TREE SWALLOW/CHAPPARAL DR/MEADOWLARK DR	SALMVA	PRJ51-03383	LCP.245	N/A
MEADOWLARK RD/TANGLEWOOD RD/LARK CIR/MERRIMAN RD	SALMVA	PRJ51-03385	LCP.246	N/A
Autumn wood LN/Crosstimbers Trail/Deerwood Rd/Cedar	RONKVA	PRJ51-03306	LCP.430	N/A
CRESTMOOR DR / CRAVENS CREEK RD / BELLE AIRE CIR /	RONKVA	PRJ51-00437	LCP.226	N/A
BLOOMFIELD AVE / SUMMERFIELD DR / RURITAN RD / BROYLES LN	RONKVA	PRJ51-02439	LCP.406	N/A

```python
    def splitNames(search):
        cursor = arcpy.da.SearchCursor(outputtable, ["ORIG_STREET", "UC_STREET", "CONSTRUCTION_DATE","TEST_FIELD","DATE_TEXT","
        for row in cursor:
            name = []
            name = row[0].split(search)
            count = len(name)
            # print(count)
            if count > 1:
                for each in name:
                    strsplit = each.split(" ")
                    listlen = len(strsplit)
                    if listlen > 2:
                        temp = strsplit[0] + " " + strsplit[1]
                    else:
                        temp = strsplit[0]
                    d = row[2]
                    tmp = d.strftime('%m-%d-%Y')
                    each2 = each.replace(".","")
                    # print(each,each2.upper(),row[2],temp.upper(),tmp)
                    tmpUC = each2.upper()
                    tmpPre = tmpUC[:2]
                    tmpPre2 = tmpUC[:3]
                    dirList = [("N ","NORTH "),("S ","SOUTH "),("E ","EAST "),("W ","WEST "),("NW ","NORTHWEST "), ("NE ","NORTH
                    for each3 in dirList:
                        if tmpPre == each3[0]:
                            each2 = each2.replace(each3[0], each3[1],1).upper()

                        if tmpPre2 == each3[0]:
                            each2 = each2.replace(each3[0], each3[1],1).upper()
```

	OBJECTID *	ORIG_STREET	UC_STREET	STREET ▲	CONSTRUCTION_DATE	MARKET
46	87	MERRIMAN RD	MERRIMAN RD	MERRIMAN RD	3/15/2023	SALMVA
47	93	MIDDLE PARK LN	MIDDLE PARK LN	MIDDLE PARK LN	3/15/2023	RONKVA
48	95	N PRESTON RD	N PRESTON RD	N PRESTON RD	3/15/2023	RONKVA
49	78	OLD LOCKE DR	OLD LOCKE DR	OLD LOCKE CT	3/15/2023	SALMVA
50	59	OVERBROOK DR	OVERBROOK DR	OVERBROOK DR	3/15/2023	SALMVA
51	4	Overland Dr	OVERLAND DR	OVERLAND DR	3/15/2023	SALMVA
52	66	PENN FOREST BLVD	PENN FOREST BLVD	PENN FOREST BLVD	3/15/2023	SALMVA

Parameters   Environments   ⓘ

Input Table

Parcel_Report ▾ 📁

Field Name (Existing or New)

JOIN STREET ▾

Expression Type

Python 3 ▾

Expression

Fields ▽	Helpers ▽
OBJECTID	.as_integer_ratio()
Shape	.capitalize()
Address_Number	.center()
Prefix_Directional	.conjugate()
Street_Name	.count()
Street_Suffix	.decode()
Post_Directional	.denominator()
Unit_Number	.encode()

Insert Values ▾   * / + - =

JOIN_STREET =

```
!Street_Name!+" "+!Street_Suffix! if !Prefix_Directional! is
None else !Prefix_Directional!+" "+!Street_Name!+" "+!
Street_Suffix!
```