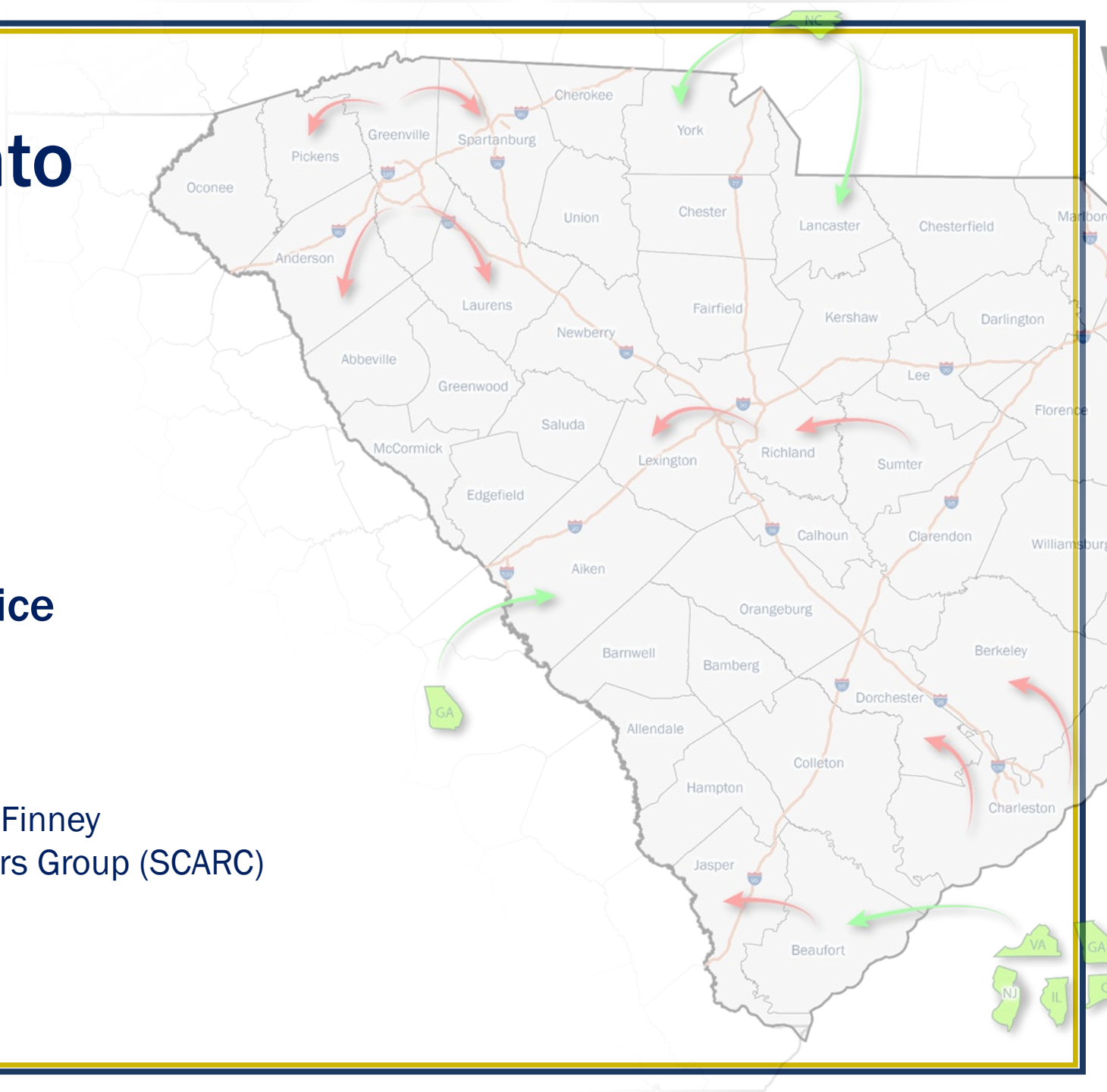


# Transforming Data into Insights: Advanced Analytics Mapping Services

SC Revenue and Fiscal Affairs Office



Rachel Passer and Chris Finney  
Presented for SC Arc Users Group (SCARC)  
October 21, 2024



# Goal of today's presentation is to explain:

- RFA's role in South Carolina State Government
- Data Services available
- Analytic Mapping Services







## Who is RFA?

- **Mission:** To provide independent research, analysis, and resources to facilitate informed policy decisions and administration of services
- **Vision:** To be a leader in value-added public service by providing the most trusted, customer-focused information and solutions
- **Staff:** The agency has a staff of approximately seventy comprised of analysts, statisticians, epidemiologists, database administrators, web developers, GIS analysts, economists, surveyors, and project and program managers



# Current Agency Overview



RFA has 4 divisions:

1. Mapping & Operations
2. Data Integration & Analysis
3. Fiscal Analysis
4. Compliance, Communications, and Technology





## Data Integration and Analysis Division

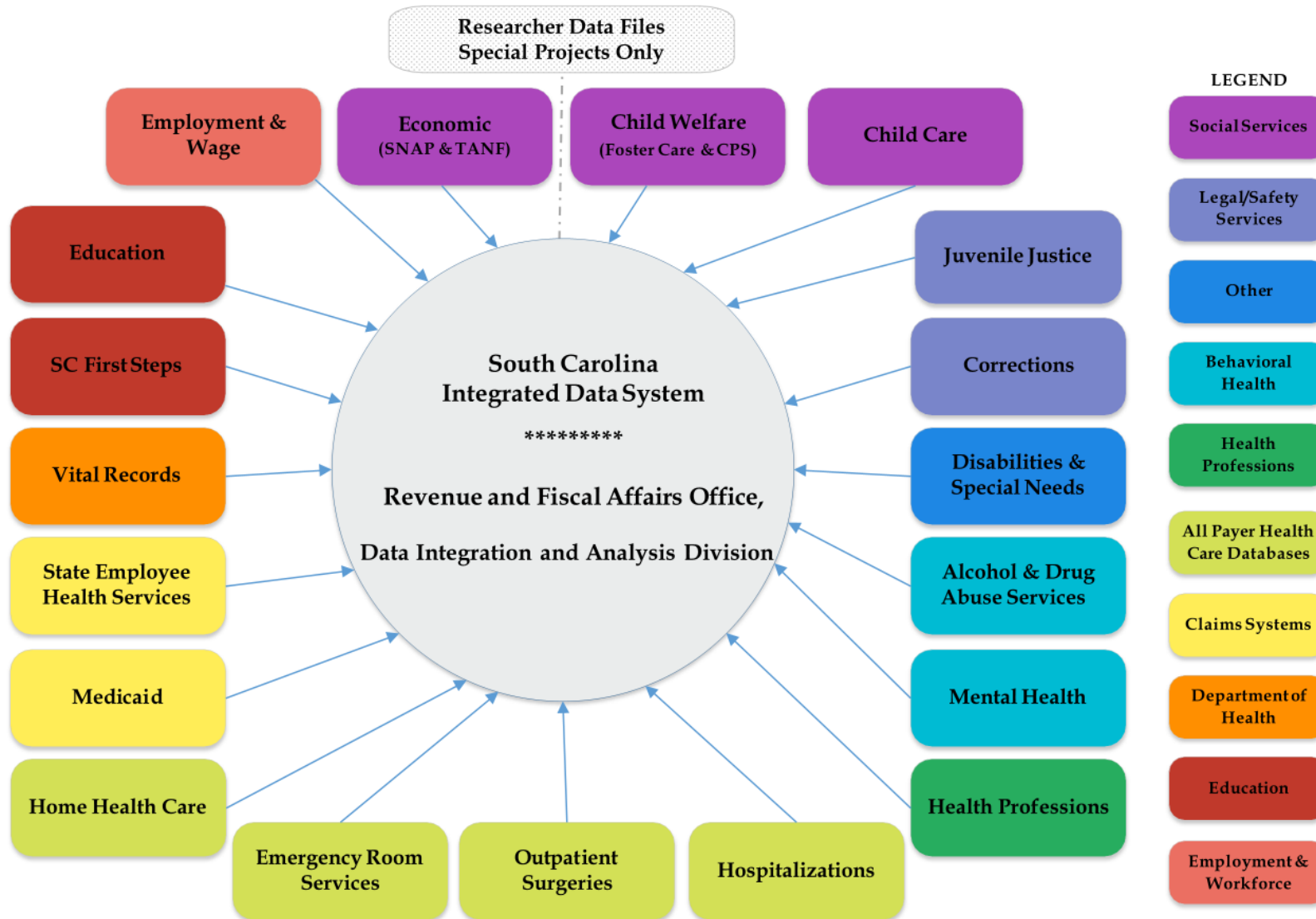
- **Division Vision:** “It is the entire human experience that influences health and social well-being and should therefore be captured and analyzed through an integrated data system.”
- **Staff:** Division has a staff of approximately twenty mostly comprised of statisticians, analysts, and database administrators.



# Authorization by Law

- Proviso 103.3 – Data Warehouse (RFAO: SC Health & Human Services Data Warehouse)
  - Authorizes RFA to receive data from any state agency and directs agencies to participate
  - Requires MOU to set the terms of use
  - Requires approval of data release by data owners
- §44-6-170 – Data Oversight Council and Joint Annual Report
  - Requires submission of inpatient, emergency department, and certain outpatient surgery data by all SC hospitals
  - Establishes Data Oversight Council to approve all data releases
- §59-18-1950 – Education and Workforce Annual Report
  - Requires submission of data by Dept of Education, SC Technical College System, and Commission on Higher Education to support mandatory reporting





- LEGEND**
- Social Services
  - Legal/Safety Services
  - Other
  - Behavioral Health
  - Health Professions
  - All Payer Health Care Databases
  - Claims Systems
  - Department of Health
  - Education
  - Employment & Workforce

# Integrated Data System

Data ownership is maintained by the submitting agency. Data is only available to researchers upon approval.

\*\*It can be made into spatial data by request.\*\*

## Data Services

- Subject Matter Expertise
- Data cleaning, formatting, standardization, sampling
- Complex linkage and analysis
- Research & reporting
- Descriptive Statistics
- Data science and visualization (mapping, graphs)

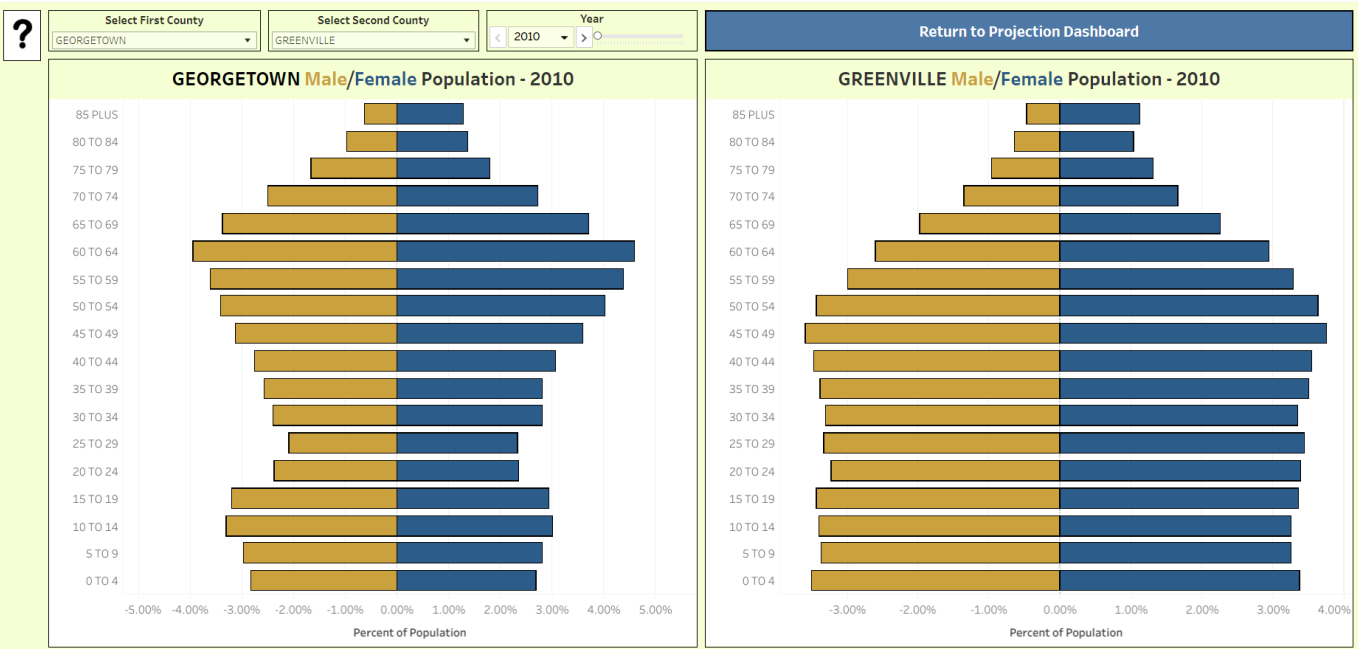
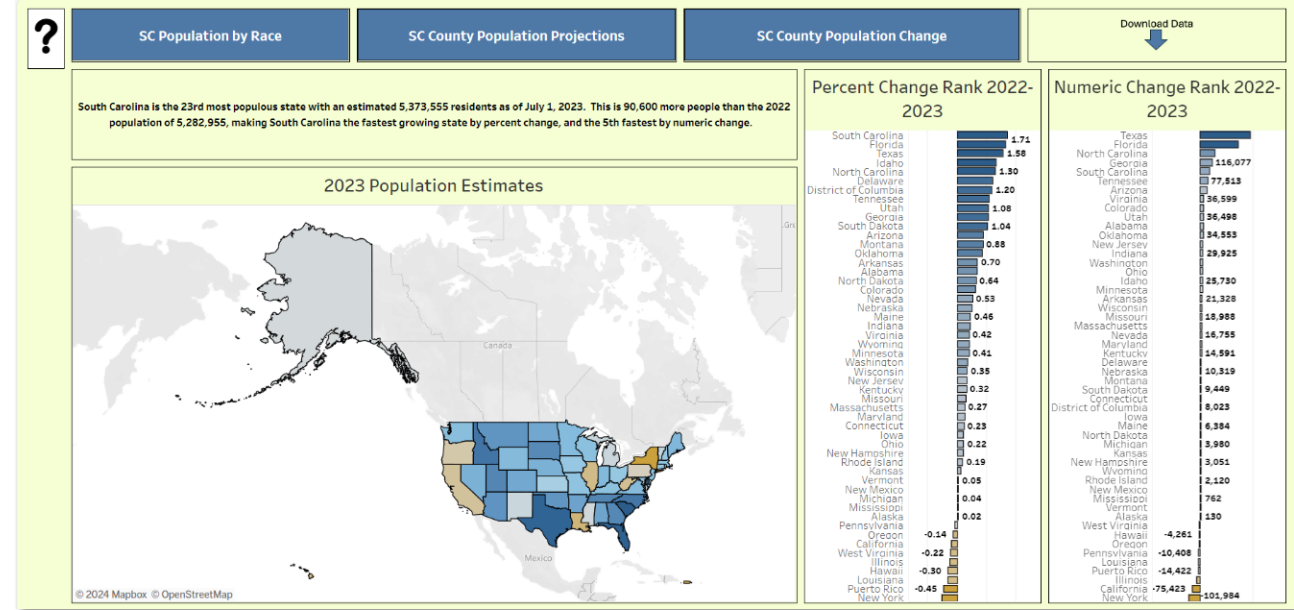


# Tableau Applications

## South Carolina Population Estimates and Projections

The South Carolina Census State Data Center at RFA is the U.S. Census Bureau's premier partner in our state for making census data more easily accessible, and for providing guidance in the use of Census Bureau data products.

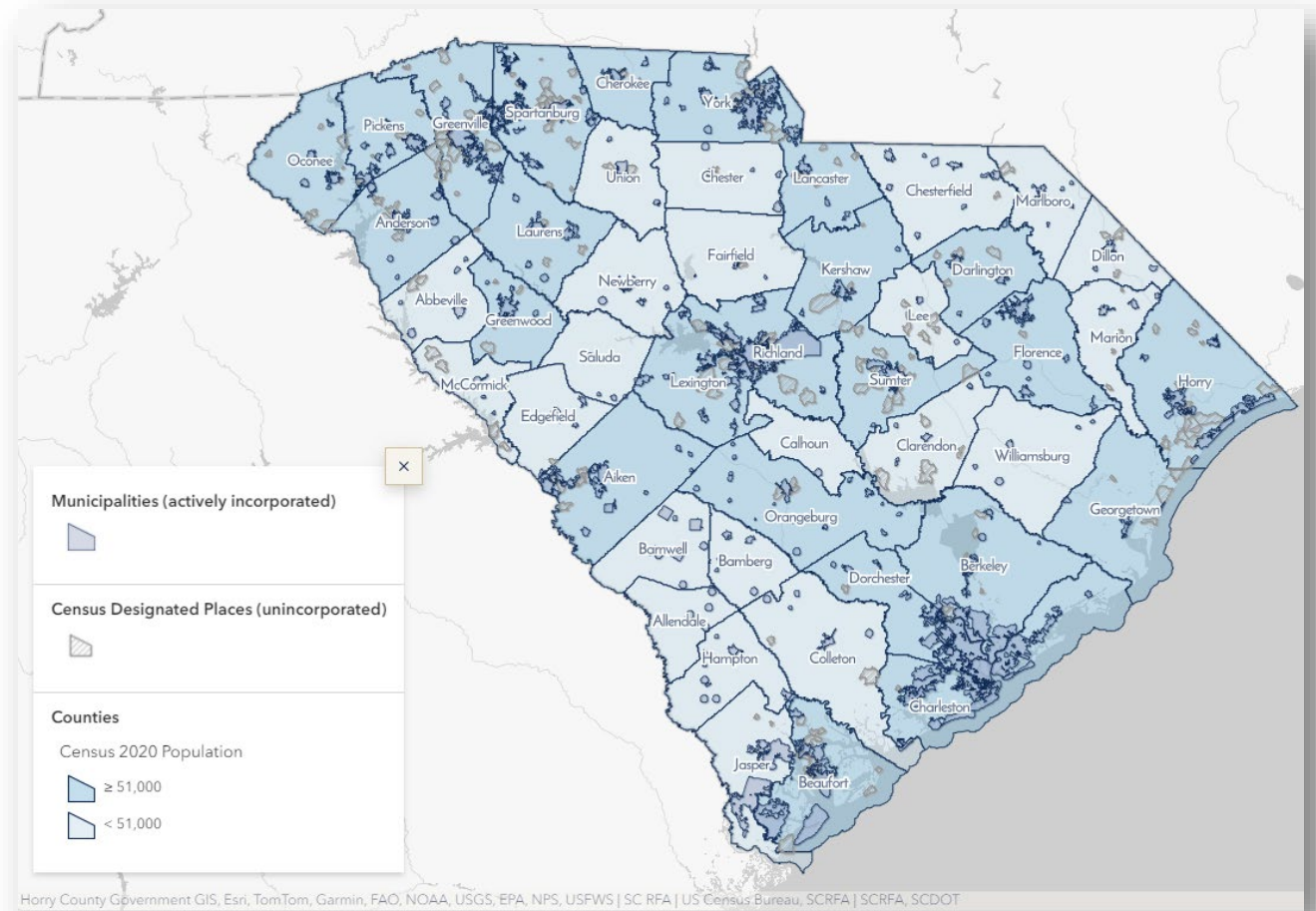
[Check out RFA's website to view the dashboard](#)



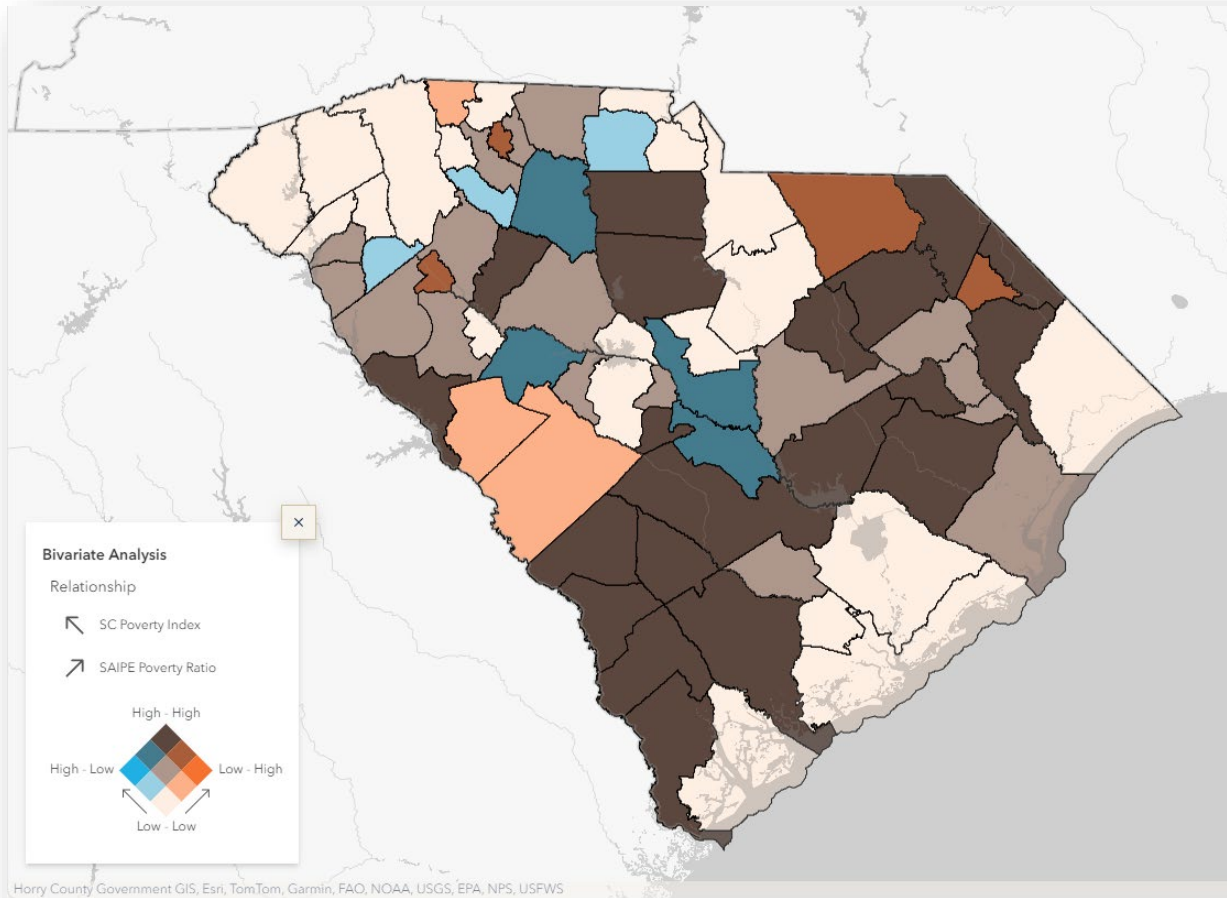
# RFA Geography and Mapping

- Jurisdictional Mapping
- Precinct Demographics and Redistricting
- Next Generation Wireless 9-1-1
- Statewide Addresses, Centerlines, and Parcels
- Geographic Information Council
- Aerial Imagery Program
- SC Geodetic Survey
- Census Bureau Programs

**....and Analytics Mapping!**



# Analytics Mapping



## Services Offered

- Data Integration
- Geocoding
- Network Analysis
- Spatial Statistics and Analysis
- Health and Demographic Research
- Custom Cartography
- Interactive Mapping and App Development

# Data Integration

## Spatial data linkage and enrichment

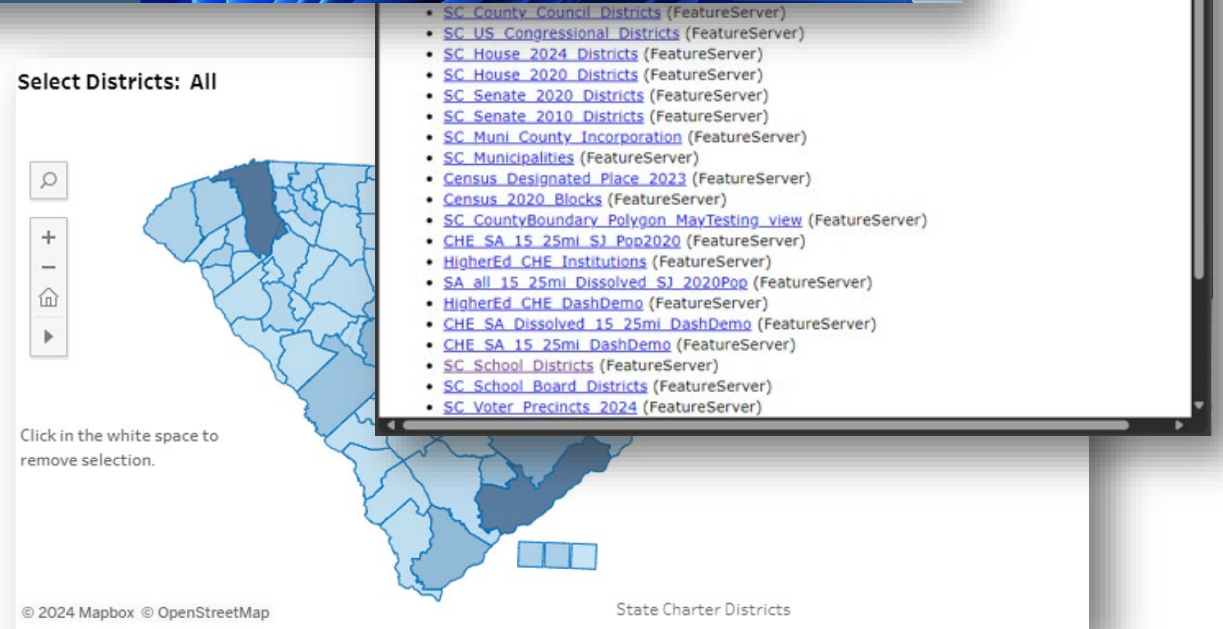
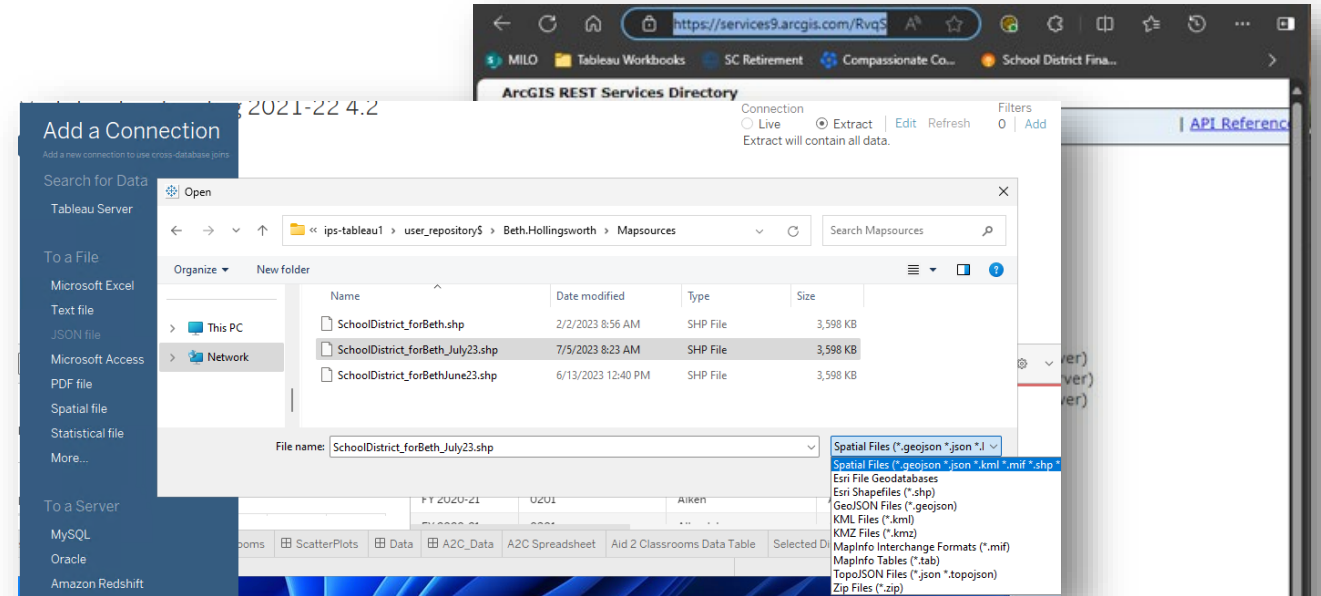
- DMV-SEC File Election Merge
- DSS SNAP/TANF unique ID by household

## Online GIS data services

- AGOL REST Services Directory
- ArcGIS Server REST Services Directory

## Integration with Tableau, SAS, SQL Server

- Support bringing ArcGIS Services into Tableau
- GIS and SAS users share deidentified files through SQL

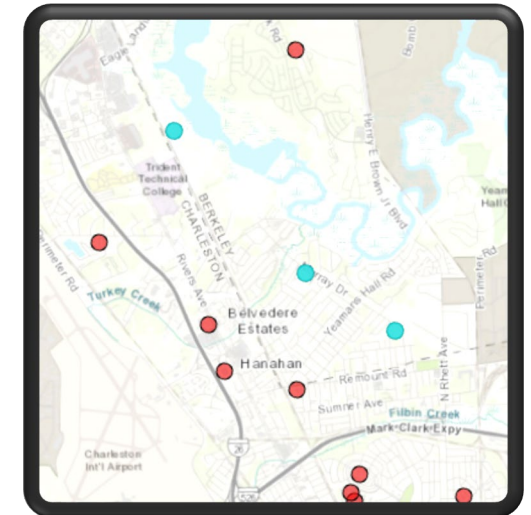




# Geocoding

Product	RFA Multi Role	StreetMap Premium
Data Source & Updated When?	SC address points and centerlines, <b>annually</b>	ESRI HERE, <b>quarterly</b>
Products & Availability	Multi-role locator* Geocoding Service**	Address locator covering North America
Use Cases	DMV, SEC, AGOL apps, GIC members	DIA GIS Services, locations outside of SC

school_name	street_address	city	zip_code
Goose Creek Elem	200 Foster Creek Road	Goose Creek	29445
Hanahan High	6015 Murray Drive	Hanahan	29410
Hanahan Middle	5815 Murray Drive	Hanahan	29410
Hanahan Elem	4000 Mabeline Road	Hanahan	29410
Henry E Bonner Elem	171 Macedonia Foxes...	Moncks Corner	29461
Howe Hall Aims Elem	115 Howe Hall Road	Goose Creek	29445



RFA Multi Role is developed in ArcGIS Pro.

\*.gcpk on GIC SFTP.

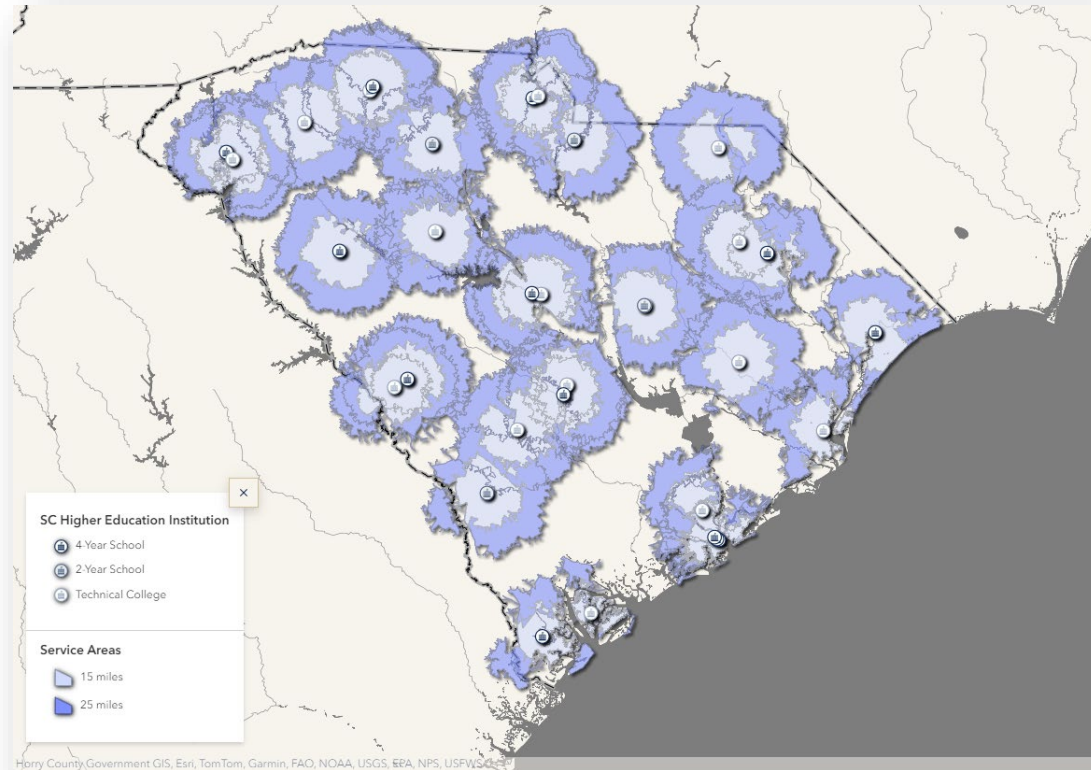
\*\* Available to public

Geocoding for customers like DSS, Medicaid, hospital claims





# Network Analysis



## Accurate Coverage

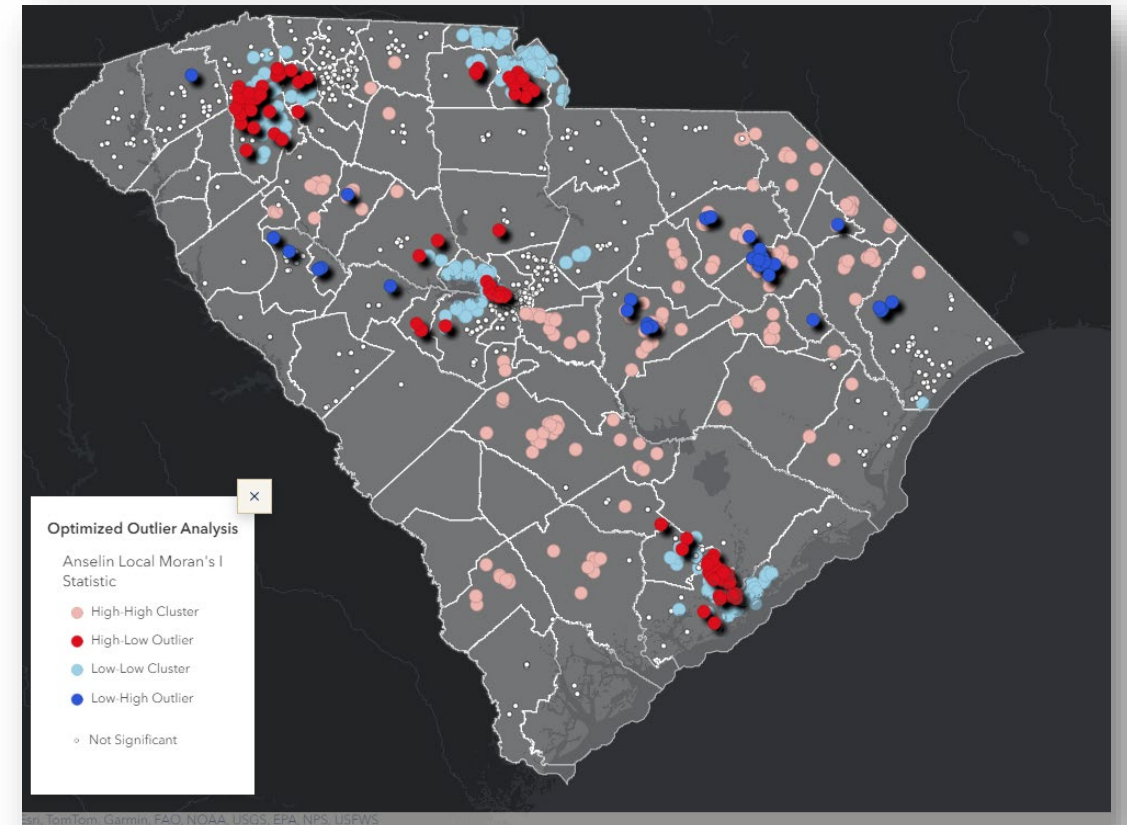
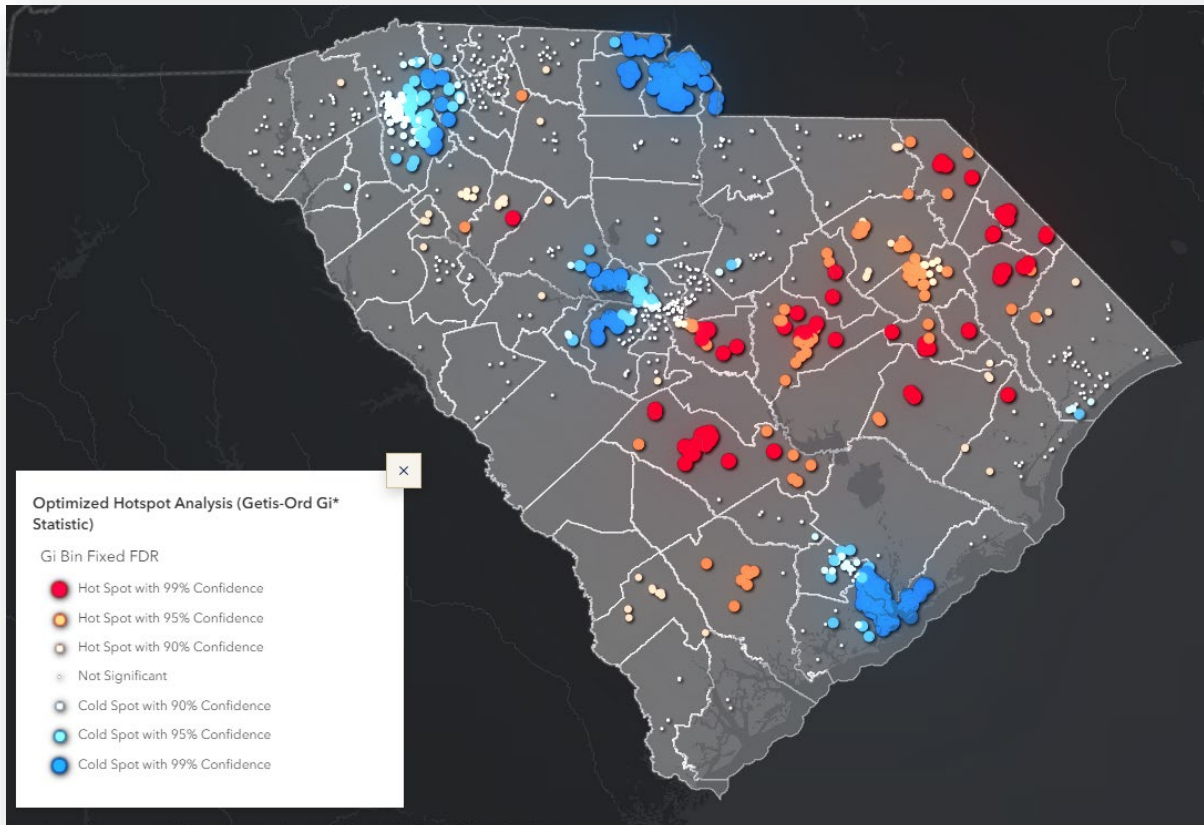
Service areas show accurate driving distances or drive times to colleges

## Measure Access to Care

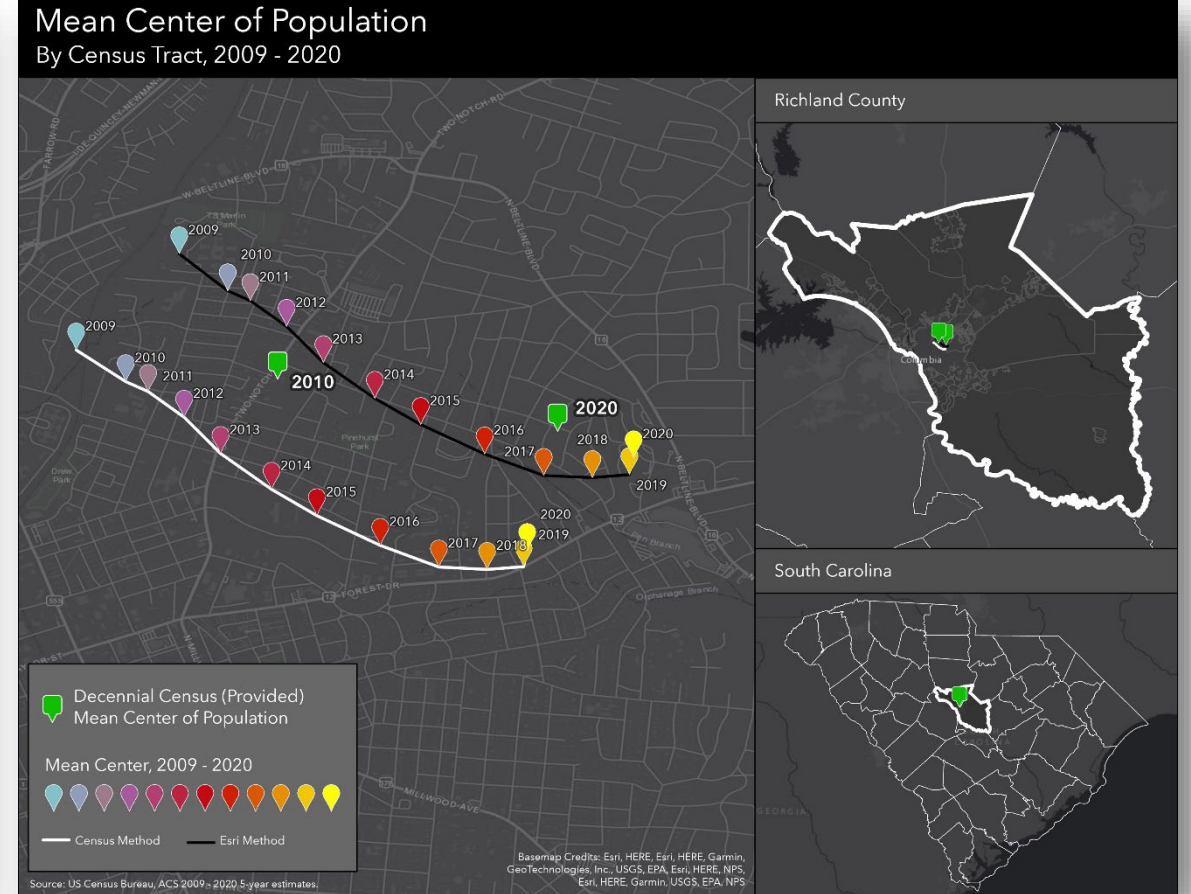
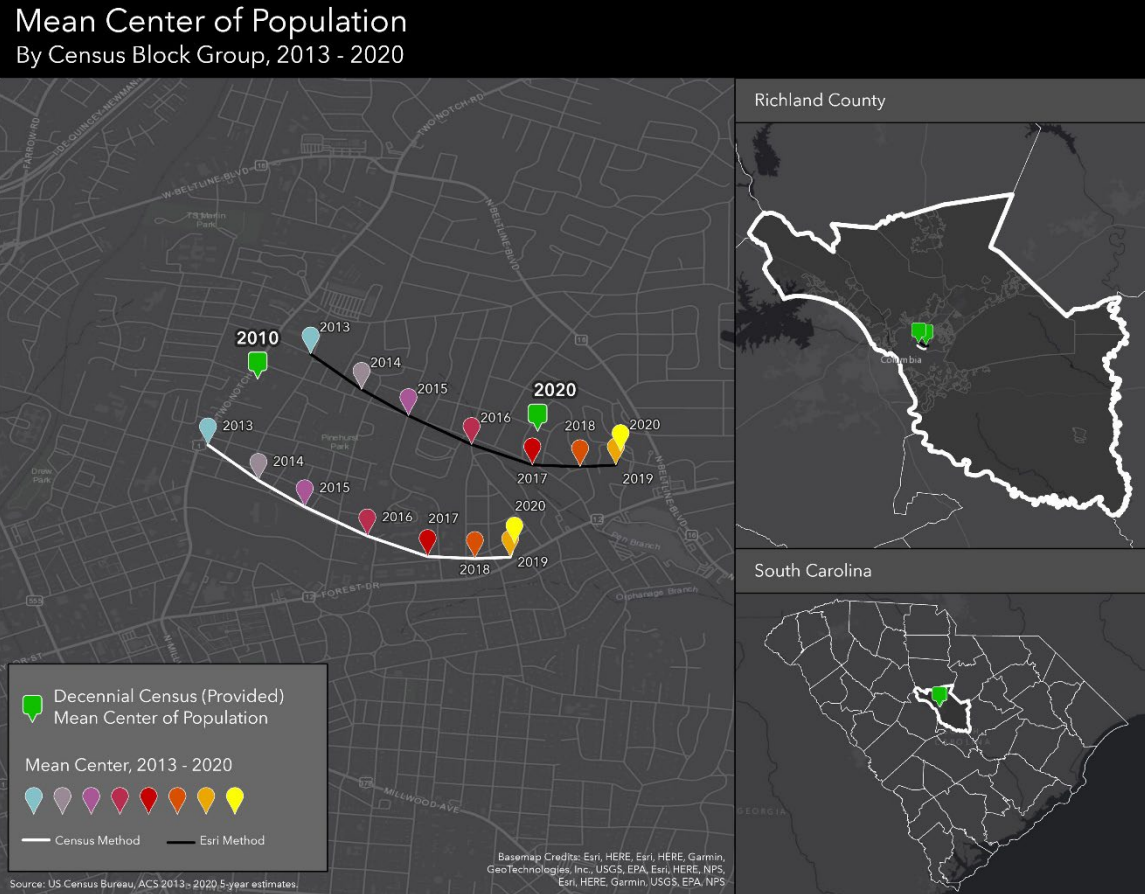
OD Cost Matrix measures distances and drive times between patients and providers

- StreetMap Premium Network Dataset
- "Known OD" Python tool on Esri's GitHub for known pairings

# Spatial Statistics: SC School Poverty Index examples

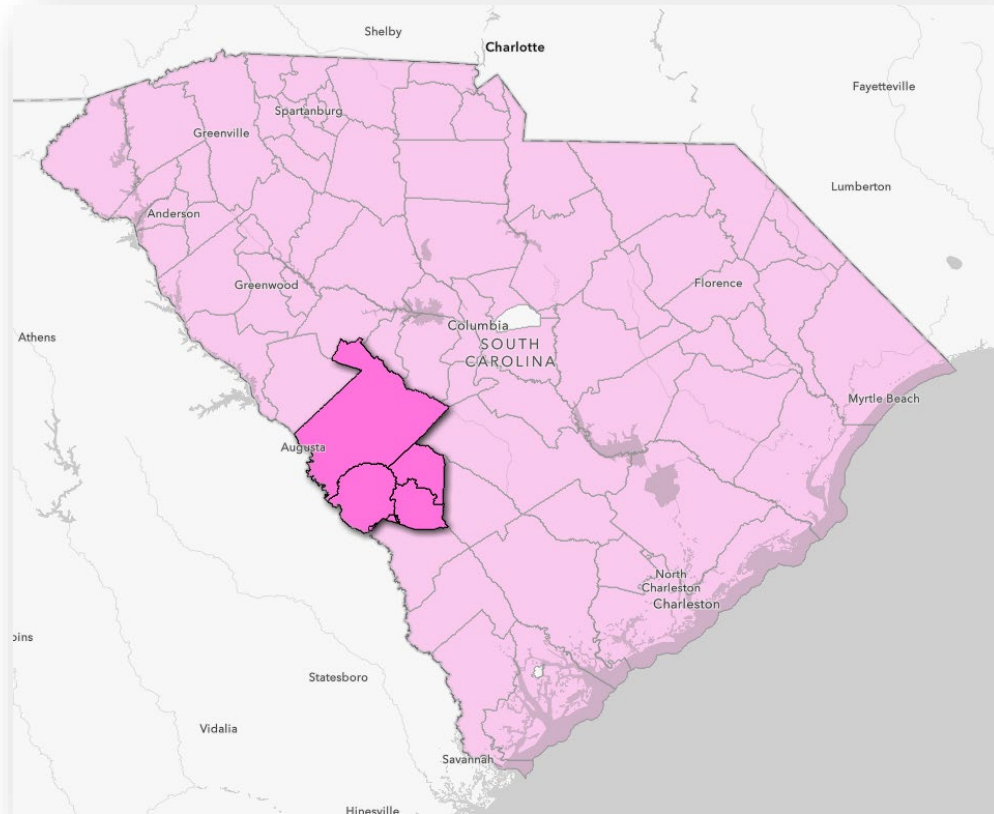


# Demographic Research– Mean Center of Population





# Geographic Census Programs

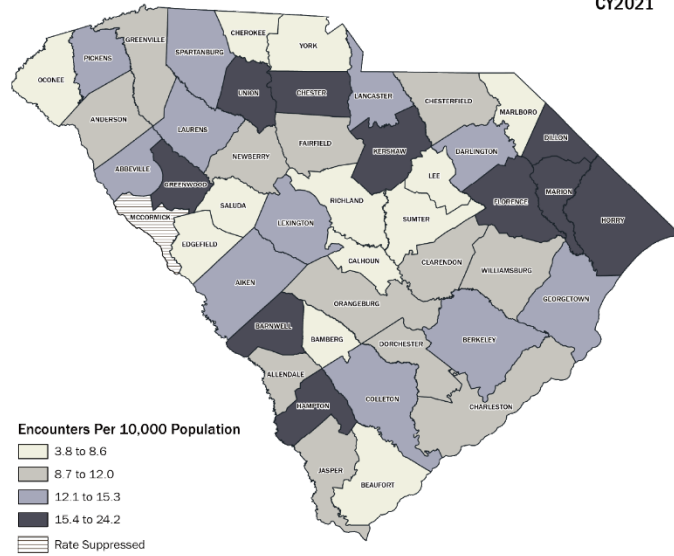


- Redistricting
- School District Review Program (SDRP)
- Boundary Annexation Survey (BAS)
- Local Update of Census Addresses (LUCA)

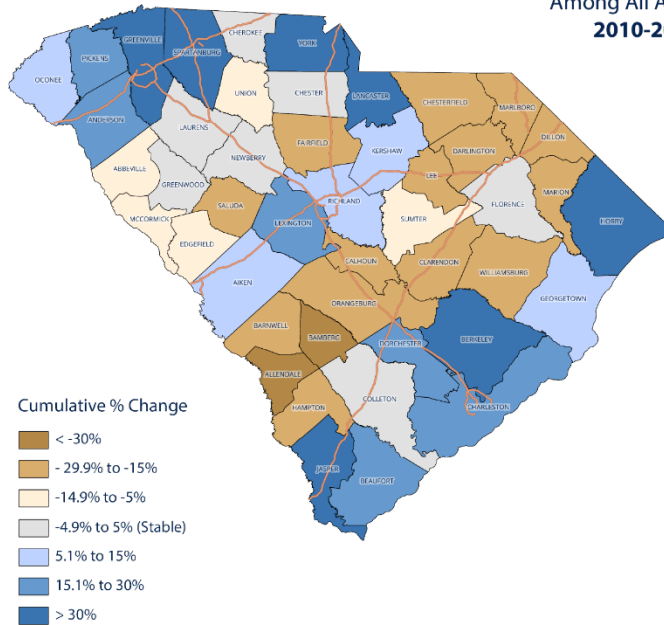


# Cartography - Thematic Maps

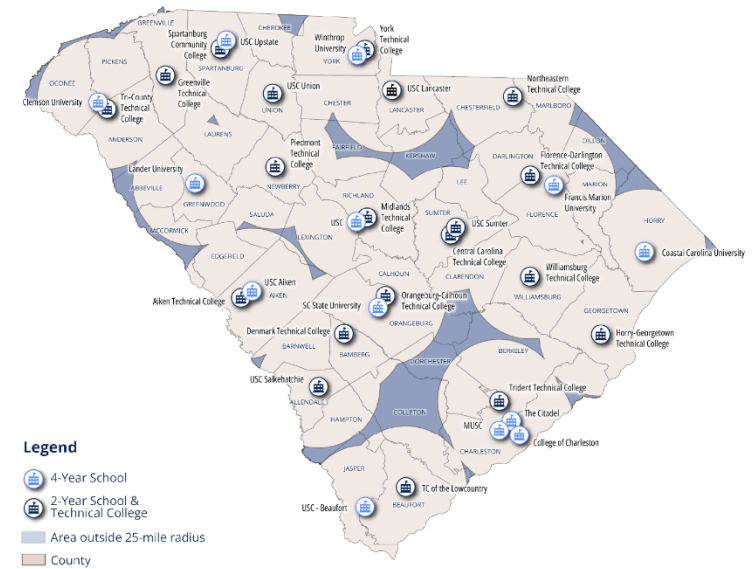
**Non-Fatal Opioid Overdose Encounters**  
Per 10,000 Population by County  
CY2021



**Estimated Cumulative Population Change**  
Among All Ages  
2010-2030



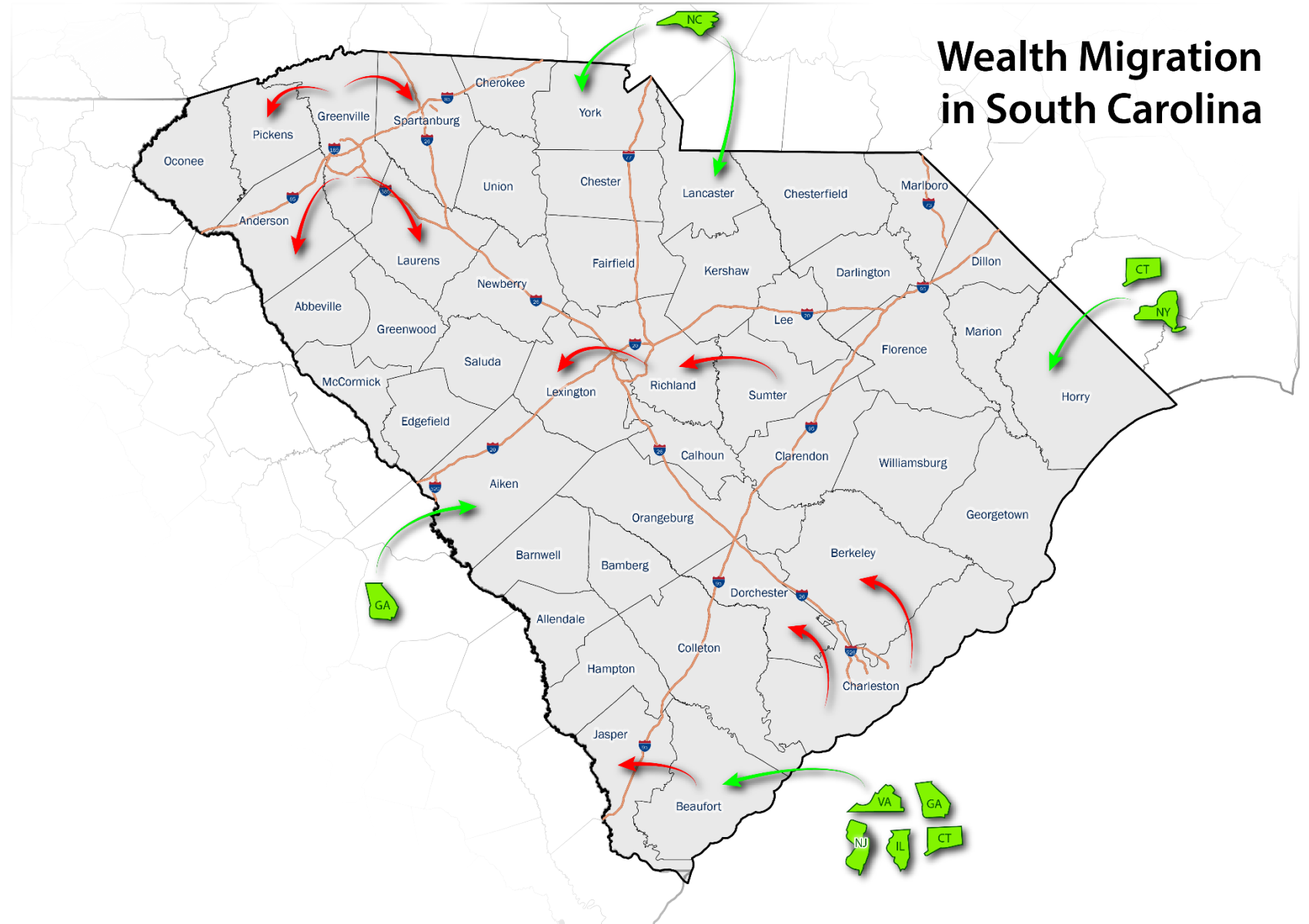
**Higher Education Institutions**  
Access to State-Funded Institutions (N = 33)





# Custom Cartography

- Data from Dept of Administration
- GIS and mapping done in ArcGIS Pro
- Cartographic Design in Adobe Illustrator



# RFA ArcGIS Online

## Apps promoting programs & resources

**SC Aerial Imagery Program**  
 With onetime General Assembly appropriations in 2020, RFA was able to...  
 Revenue and Fiscal Affairs Office

**SC Next Generation Wireless 9-1-1**  
 LIVE 45  
 Implementation in 2024

**NG911 Program Status Dashboard**

**SC District Info**  
 Search for a South Carolina address here  
 Search for a South Carolina address above to find local district information.  
 South Carolina Revenue and Fiscal Affairs Office  
 District info is a tool designed to provide information related to the various districts associated with a South Carolina address or point on the map. Below is a quick reference guide to assist you.  
**GETTING STARTED** [Click here for detailed instructions.](#)  
 Search a South Carolina address using one of the following search methods:  
 • Enter an address in the search box  
 • Select **Use current location**  
 • Click a point within the map  
 Additional functionalities are available such as exporting results to PDF or screenshot image of results.  
 The application will return the following attributes for the address:  
 • SC Senate and House District  
 • US Congressional District  
 • Municipality  
 • County Council District

**2024 SC House District**  
 \* To be used in the 2024 election  
 SC House District: HD-072  
 2020 Census Population: 42,041

**US Congressional District**  
 US House District: 6  
 Representative: James Clyburn (D)  
 Representative Website: [View](#)

**SC County**  
 County Name: Richland  
 County Sales Tax Rate: 8%  
 2020 Census Population: 416,147  
 Council of Government (COG): Central Midlands COG





# SC District Info

Search SC address, find SC districts it's within

## Features

- Up to date district data
- Geocoding Service
- Accessible design



SC District Info

Enter a South Carolina address here

Search a South Carolina address above to find local district information.

South Carolina Revenue and Fiscal Affairs Office

District info is a tool designed to provide information related to the various districts associated with a South Carolina address or point on the map. Below is a quick reference guide to assist you.

**GETTING STARTED** [Click here for detailed instructions.](#)

Search a South Carolina address using one of the following search methods:

- Enter an address in the search box
- Select **Use current location**
- Click a point within the map

SC District Info

1000 ASSEMBLY ST, COLUMBIA, SC, 29201

Results:13

2024 SC House District	
* To be used in the 2024 election	
SC House District	HD-072
2020 Census Population	42,041

US Congressional District	
US House District	6
Representative	James Clyburn (D)
Representative Website	<a href="#">View</a>

SC County	
County Name	Richland
County Sales Tax Rate	8%
2020 Census Population	416,147
Council of Government (COG)	Central Midlands COG
COG Website	<a href="#">View</a>

SC Municipality

Clear search location

1000 ASSEMBLY ST, COLUMBIA, SC, 29201

Esri Community Maps Contributors, © OpenStreetMap, Microsoft, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, ... Powered by Esri

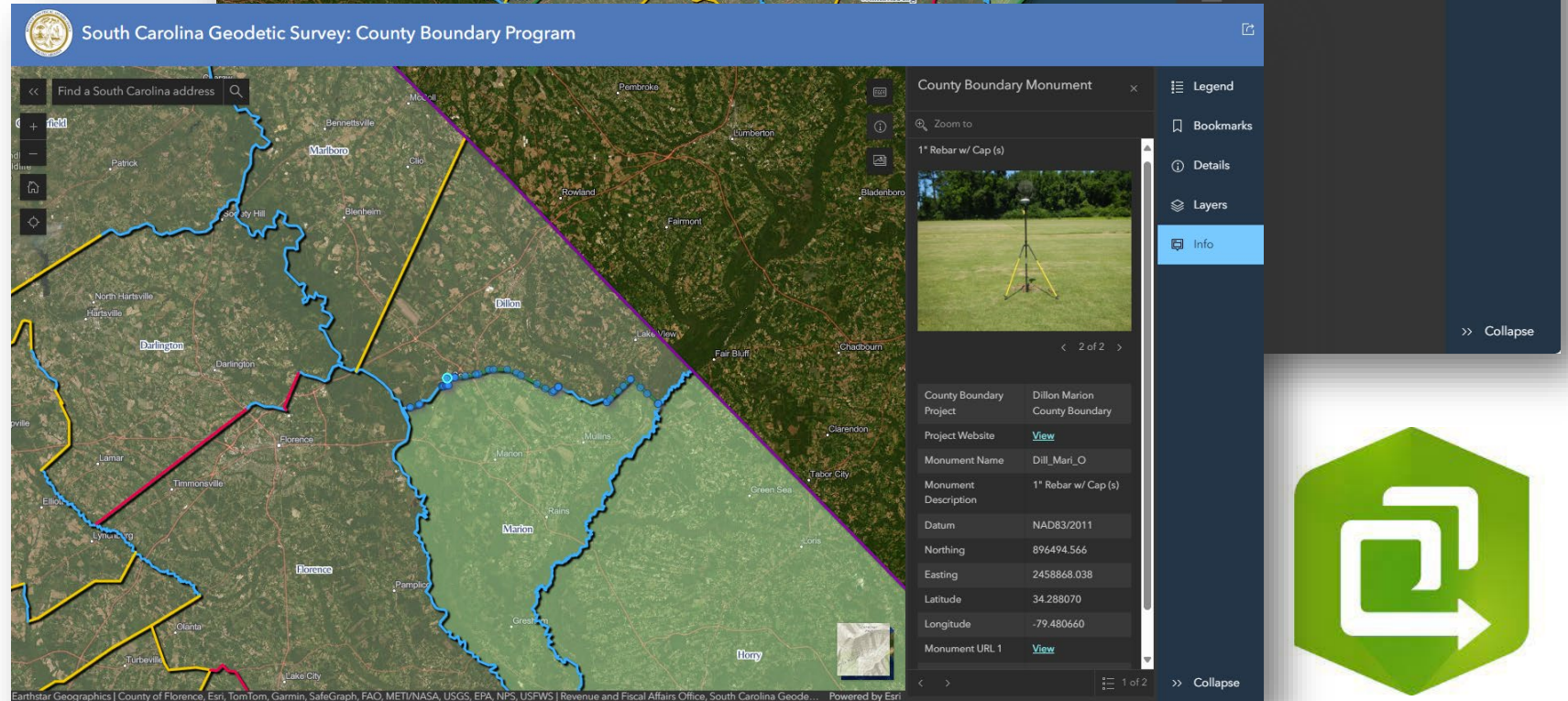
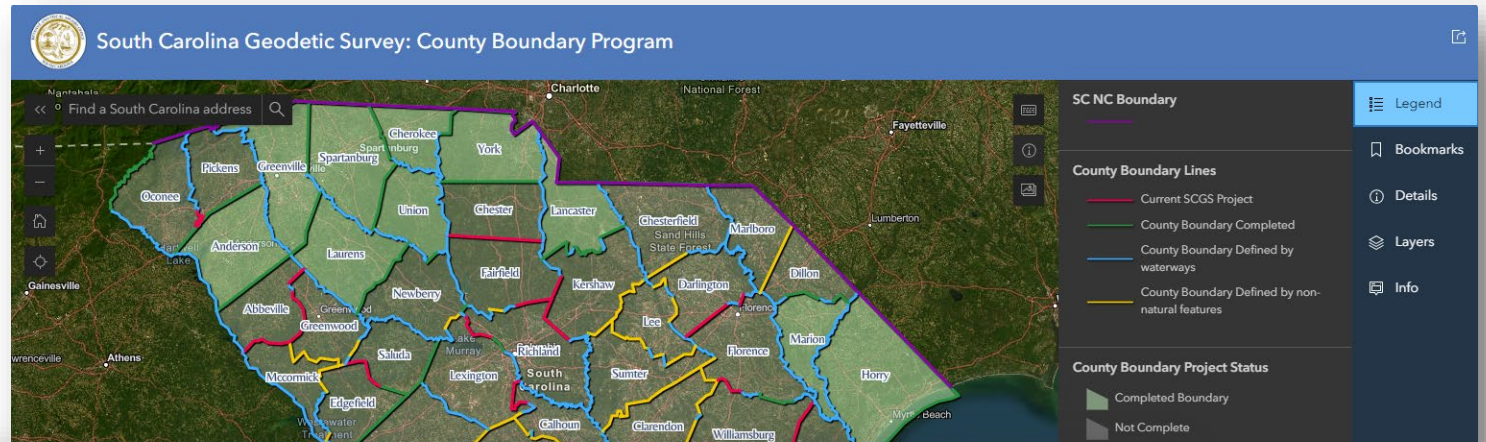


# SCGS County Boundary Program

Explore survey fieldwork from SC Geodetic Survey

## Features

- Project status
- Survey fieldwork
- Links to project websites and certified plats





# Aerial Photography StoryMap

Showcases the RFA program and provides resources to the public

<https://storymaps.arcgis.com/stories/f93f78e0fb59473a893da41b63c1a4cb>

“Interactive Scrollytelling”



**SC Aerial Imagery Program**

The SC Revenue and Fiscal Affairs Office (RFA) manages the Aerial Imagery Program, which collects statewide aerial imagery every 3 years.

Revenue and Fiscal Affairs Office, GIS Section  
June 10, 2024

**Add Imagery to Your Project**

Use the links in the table below to add aerial imagery to your project.

Add to CAD Projects	Link to 2023 Imagery	Link to 2020 Imagery
<a href="#">WMTS Instructions</a>	<a href="#">2023 RGB Tile Layer</a>	<a href="#">2020 RGB Tile Layer</a>
	<a href="#">2023 NIR Tile Layer</a>	<a href="#">2020 NIR Tile Layer</a>

Tile layers are hosted by Esri on ArcGIS Online.

**Program Funding**

led for the initial image capture, the program will need to  
om program partners and stakeholders to continue



# Visual Analytics - ArcGIS Dashboards

South  
Carolina  
Higher  
Education  
Access  
([arcgis.com](https://arcgis.com))



## South Carolina Higher Education Access

For demonstration purposes only, June 2024

Select a School Type

4-Year School

Select a Driving Distance (in miles)

☰

Select a school from the list below:

- Clemson University
- Coastal Carolina University
- College of Charleston
- Francis Marion University
- Lander University
- Medical University of South Carolina
- South Carolina State University
- The Citadel

### Statewide Summary of 4-Year Schools (13)

## 367,699

Ages 18-24 within 25 miles

## 78%

Ages 18-24 within 25 miles

## 3,850,637

Total Population within 25 miles

## 75.2%

Total Population within 25 miles

Esri, TomTom, Garmin, FAO, NOAA, USGS, EPA, USFWS Powered by Esri

### Populations within Driving Distances

Higher Education Institution	Service Area Distance (mil...)	Population Ages 18 to 24	% of Total, 18 to 24	Total Population	% of Total
Clemson University	25	46,412	9.9	380,990	7.4
Coastal Carolina University	25	28,277	6.0	351,778	6.9
College of Charleston	25	62,673	13.3	663,636	13.0
Francis Marion University	25	15,147	3.2	182,363	3.6
Lander University	25	11,542	2.4	120,080	2.3
Medical University of Sout...	25	63,430	13.5	674,181	13.2
South Carolina State Unive...	25	10,696	2.3	100,904	2.0
The Citadel	25	63,663	13.5	677,497	13.2
University of South South...	25	15,170	3.2	182,363	3.6

Note: Table values are based on the Driving Distance. Please select 15 or 25 miles from the institution.

◀ 1 of 13 ▶

### Research Institution

# Thank you!

To learn more about RFA's data services, products, and rates for service, please contact:

**Data Services & Consultation:**

[dia.programs@rfa.sc.gov](mailto:dia.programs@rfa.sc.gov)

**Analytics Mapping:**

[analyticsmapping@rfa.sc.gov](mailto:analyticsmapping@rfa.sc.gov)

