# SCENARIO PLANNING & LIKELY IMPACTS ANALYSIS TECHNICAL DOCUMENT

Companion document to the One Berkeley Comprehensive Plan

Version March 16, 2022

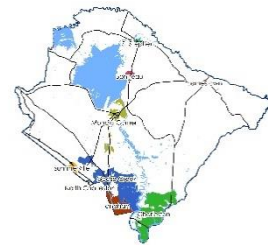# BERKELEY COUNTY, SC

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Berkeley County completed a scenario planning and likely impacts analysis to accompany its new 2040 Comprehensive Plan, One Berkeley.  It contemplated four alternative growth scenarios for a county-wide planning area, measured their impacts, and evaluated the trade-offs between them for meeting stated goals for the community.  The scenarios were also used to enumerate infrastructure and financial impacts associated with the four different conservation and development futures, which will influence the creation of a Future Land Use Map for the new Comprehensive Plan.  Findings and conclusions in the report that are focused on government finances, future land use categories, supporting infrastructure, and the costs of providing services will also be considered for specific policies and recommendations in the new Comprehensive Plan.

The Scenario Planning and Likely Impacts Analysis Report presents information for Unincorporated Berkeley County and the cities and towns within it separately.  The information for Unincorporated Berkeley County is highlighted in different report chapters, which will be considered while developing the new Comprehensive Plan. Information for nine individual cities and towns within Berkeley County is presented in the technical appendix of the report, and is available to the individual jurisdictions for their use independent of the County's initiative to write its new Comprehensive Plan.

The Report is organized into seven chapters:

**General Overview** — A brief overview of the planning area, key concepts, and the work completed for the scenario planning and likely impacts analysis.

**Methodology and Tools** — A summary of four primary components developed to support
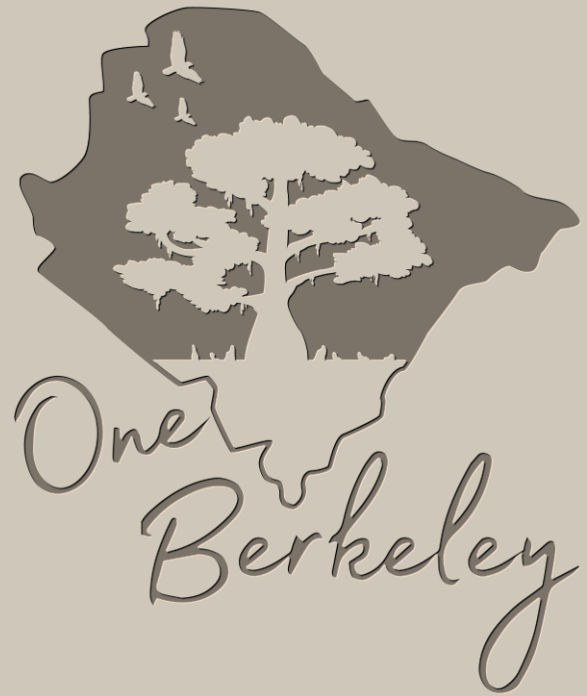
# OUR ROLE IS TO EMPOWER OTHERS TO MAKE MORE INFORMED DECISIONS ABOUT THEIR FUTURE.

the general methodology and analysis tools for the study: unit of analysis, data collection and creation, the Berkeley County CommunityViz Model, and the Berkeley County Likely Impacts Model.

**Growth Forecast Assessment** — A summary of committed development data and growth forecasts used in the analysis.

**Alternative Scenarios** — A summary of the four alternative growth scenarios contemplated for the planning area, and a high-level comparison of their differences, impacts, and trade-offs.

**Infrastructure Impacts** — A detailed summary of impacts to seven different infrastructure categories associated with each of the alternative growth scenarios.

**General Findings and Conclusions** — A presentation of general findings and conclusions from the scenario planning and

likely impacts analysis, and summary of key issues or themes to consider when developing the new Comprehensive Plan.

**Technical Appendix** — A compilation of specific data, equations, and assumptions used for the scenario planning and likely impacts analysis, including city-, town-, and county-level reporting.

The Scenario Planning and Likely Impacts Report is accompanied by the Berkeley County CommunityViz Model and the Berkeley County Likely Impacts Model as final deliverables for the project. The CommunityViz Model was delivered with a perpetual license for the software and one year of technical support included. The software requires a copy of ESRI's ArcGIS Desktop v. 10.6 or higher and a copy of CommunityViz v. 5.2 or higher on the same computer to open and run properly.

The Likely Impacts Model was developed with Microsoft Excel software and will work on

computers in the County that include the typical suite of Microsoft Office products. Both Models are available to the County for their continued use independent of the consultant. The information in this Report also serves as technical documentation for maintaining both models.

## Scenario Planning Overview

Scenario planning is a process that considers multiple futures for a planning area based on competing physical, policy, or financial scenarios. Scenarios contemplated for the area are not forecasts or predictions, but possible futures that might occur based on physical features, community desires, infrastructure investments, or policy-decisions in the area. They represent possible futures based on what already exists, emerging trends and opportunities, or community desires to change the future. The essential requirement for any growth scenario is that it is plausible, within the realm of what exists today, or what could be in the future.

Each growth scenario contemplated for Berkeley County included a theme, story, and map to convey big ideas or important decisions facing the community. The scenarios were developed over an eighteen-month period and included several phases of data collection and evaluation. A major initiative within the initial data collection phase included the development and deployment of an online survey that went out to county and municipal organizations responsible for the different fire departments, police departments, public works departments, school district, and public utilities present in Berkeley County. Several rounds of data collection requests were made for the project until the team reached nearly 100% participation from all city, town, and county service providers.

Anticipated residential and non-residential growth forecasts for the planning area were developed from several sources: the CHATS Travel Demand Model, US 52 Corridor Study, South Carolina State Demographer, and historical building permit data from Berkeley County and its municipalities. This information was varied across the different scenarios, based on the data source, to test alternative growth models and trends — whether focused on market forces in the region or potential policies that could slow growth to keep pace with available infrastructure capacity. Detailed information about the different growth forecasts assumed for the four scenarios is presented later in the report.

Ultimately, the scenarios themselves are fictitious stories about the future and offer objective views of the trade-offs associated with competing growth alternatives. Information presented for the Scenario Planning and Likely Impacts Report is almost entirely data-driven, and the findings and conclusions presented in the report respond to the data presented. It is important to put this information in the context of the overall planning process for the One Berkeley 2040 Comprehensive Plan, and weigh the Report's recommendations against the community vision and guiding principles created for the Plan document.

## Link to the Comprehensive Plan

As communities grow, the demands placed on supporting infrastructure continue to rise and eventually necessitate additional capacity improvements to maintain adequate levels of service. The Scenario Planning and Likely Impacts Report was completed concurrent with the new Comprehensive Plan to inform the planning process. Findings and conclusions from the analysis were shared

# What is CommunityViz?

CommunityViz is an extension of ESRI's ArcGIS desktop software that facilitates the visualization and comparison of alternative development scenarios. It was originally developed by the Orton Family Foundation, a non-profit group that focuses on technology and tools for more-informed community decision-making.

There are two components of CommunityViz software. The first is Scenario 360, which is a two-dimensional map and data analysis component of the software. It adds the functionality of a spatial spreadsheet to ArcGIS for Desktop software, similar to how a spreadsheet program like Microsoft Excel handles numerical data. Dynamic calculations embedded in the spatial spreadsheet are controlled by user-written formulas that change value as referenced input values change. The impact of physical development or policy decisions under consideration may be measured side-by-side in two or more growth scenarios contemplated in the software.

The second component of CommunityViz software, Scenario 3D, is a visualization tool that constructs three-dimensional models of buildings, roads, landscapes, or entire communities using two-dimensional information generated in the Scenario 360 analysis.

More information on CommunityViz and its capabilities for municipal planning is available on the software company's website (www.communityviz.com) or *The Planner's Guide to CommunityViz* published by the American Planning Association in 2011.
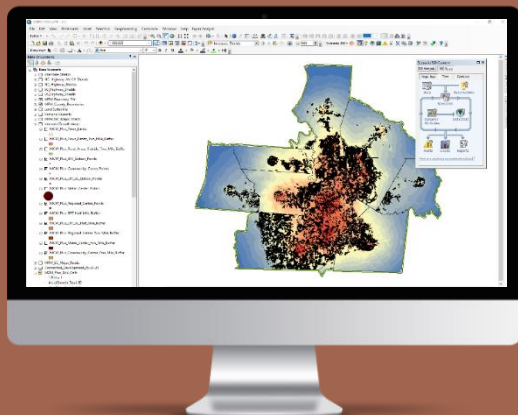


with the public during a one-day Growth Choices Workshop, which was held in four locations simultaneously on February 17, 2022. A virtual workshop event accessible to the public via the project website extended the community comment period through February 28, 2022. Feedback received during the public comment period will be considered by the project team responsible for writing the new Comprehensive Plan.
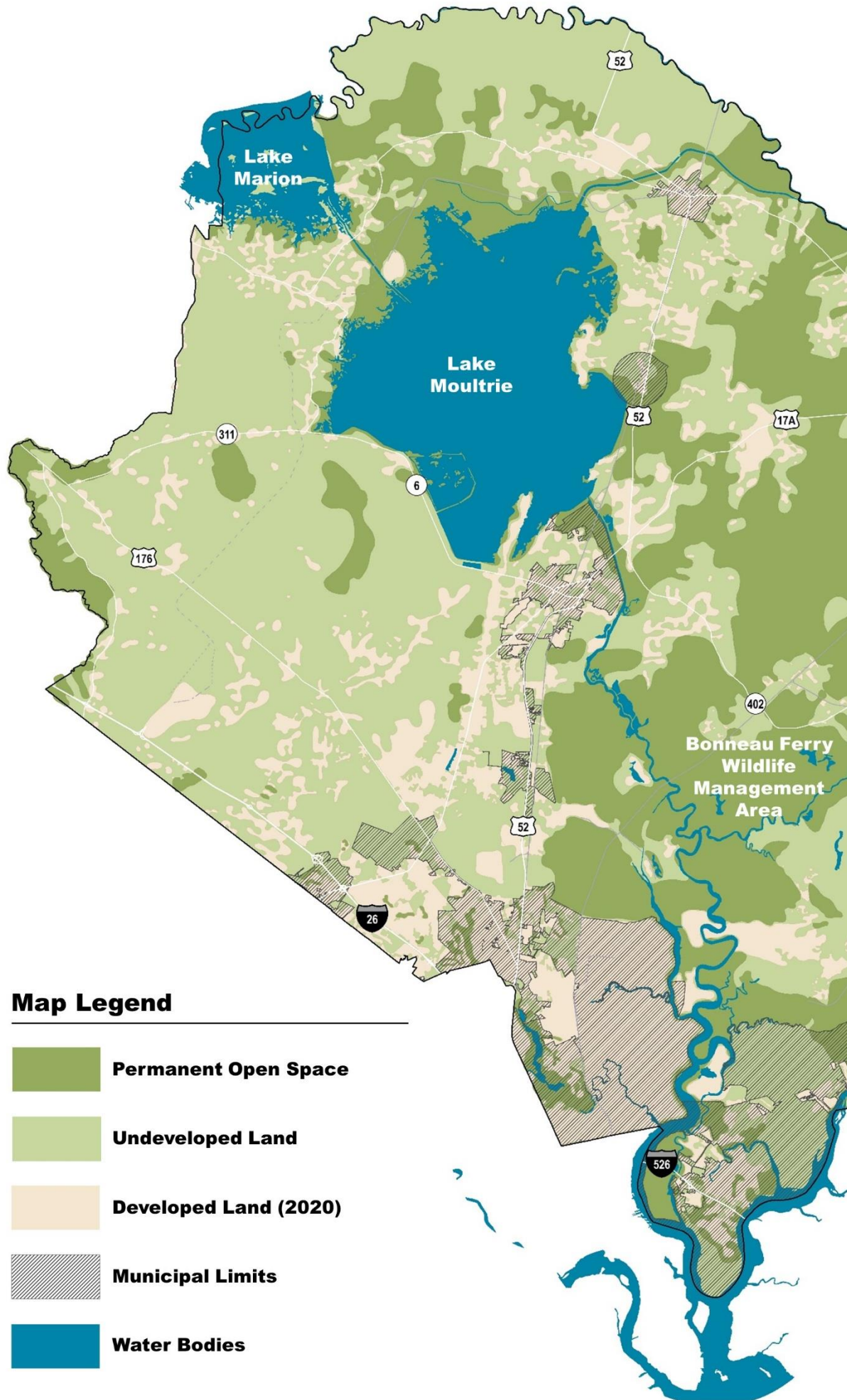
## Planning Area Description

Berkeley County is the eighth largest county in South Carolina by population and the third largest by area. It includes nine municipalities with Moncks Corner the county seat. Interest and investments in the County have continued for decades, most recently as the aerospace and manufacturing industries have been drawn to the Charleston Region. In addition to rapid economic growth, a relatively modest cost of living and high quality of life help attract new residents to the area.

The County includes 1,229 square miles of land and an existing population of 229,861. Residents and businesses are connected to the Region by railroads; SC Highways 6 and 41; US Highways 17A, 52, and 176; and Interstates 26 and 526.

## Baseline Conditions Summary

A snapshot of baseline conditions captured for Berkeley County is provided on pages five and six to compare against the four scenario concepts presented later in the report. A detailed summary of conditions for several infrastructure and revenue topics important to the likely impacts analysis is provided in the technical appendix.

Lake Marion

Lake Moultrie

Bonneau Ferry Wildlife Management Area

52

52

17A

311

6

176

402

26

52

526

## Map Legend

Permanent Open Space

Undeveloped Land

Developed Land (2020)

Municipal Limits

Water Bodies

# Berkeley County in 2020

**229,861**
Population

**84,461**
Dwelling Units

**60,274**
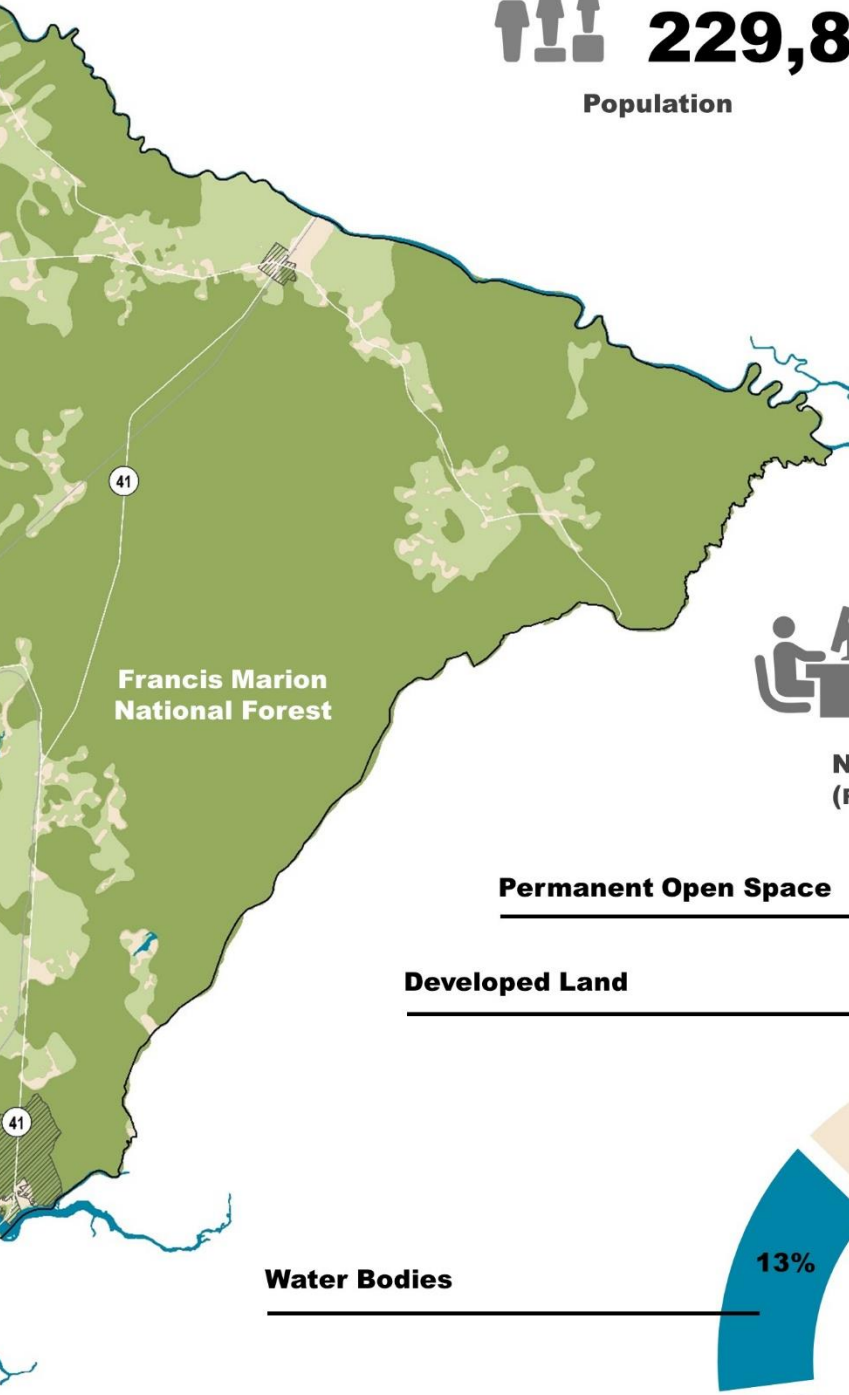Employees

**54,337,000**
Non-Residential Square Feet
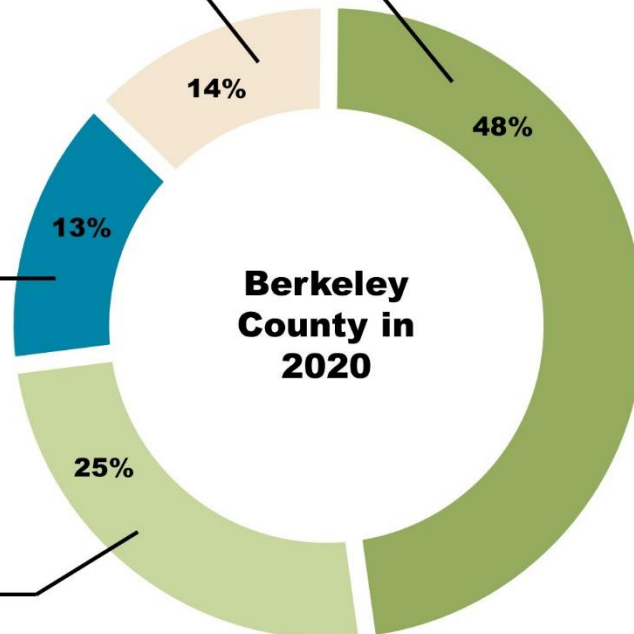(Retail • Office • Industrial • Institutional)

Francis Marion
National Forest

Permanent Open Space

Developed Land

Water Bodies

Undeveloped Land

48%

14%

13%

25%

Berkeley
County in
2020

# Project Methodology and Analysis Tools

The general methodology and analysis tools used for the scenario planning and likely impacts analysis are presented under each model topic: the Berkeley County CommunityViz Model and the Berkeley County Likely Impacts Model. Information presented in other sections of the report, and referenced here for the methodology and analysis tools descriptions, support the findings and recommendations for the scenario planning and likely impacts analysis developed for Berkely County.

A copy of the new Berkely County CommunityViz Model and the new Berkeley County Likely Impacts Model were provided to the Berkeley County Planning and Zoning Department and the Berkeley-Charleston-Dorchester Council of Governments as final deliverables for the project, which may be used by either organization independent of the consultant for future applications.

## Berkeley County CommunityViz Model

The Berkeley County CommunityViz Model was created to visualize alternative growth scenarios for the Comprehensive Plan using data collected for the county-wide planning area and input received during the planning process.  The Model includes five major components:  carrying capacity analysis, external lookup tables, build-out potential analysis, land suitability analysis, and growth allocation.  Starting data sets required to build the Model, and each of the five Model components are described below.

## Unit of Analysis: Grid Cells

Grid cells were used as a common geography in the Berkeley County CommunityViz Model to address the different number of features and shapes associated with different input data for the alternative growth scenarios. They were used to aggregate and normalize data for property values, taxing, committed development, existing development, and different shapes and size areas for future development (intended growth areas) associated with the four scenarios.  The simple and common unit of analysis is considered stable for using the Model for years to come while input data like parcels or service areas continue to change annually.

The distribution of grid cells for the planning area is consistent with the BCDCOG Regional CommunityViz Model.   37,969 vector-based grid cells were used to represent the Berkeley County planning area.

In CommunityViz, the overlap most function was used to transfer data from individual data sources to grid cells in the Model.  The function retrieved a value for each grid cell based on the amount of spatial or numeric

overlap with the underlying ArcGIS data.  The value assigned to each grid cell represented the underlying data value most represented inside the grid cell (using shape area as the criterion) when multiple features were overlapped.

## Data Inventory & Analysis

Two new geographic information system (GIS) data sets — development status and future land use categories — were created for the Berkeley County CommunityViz Model.  A description of both data sets and the information used to create them is provided on the following pages.

## Development Status

Development status in Berkeley County told CommunityViz which set of equations to use for estimating the development yield (build-out potential) of a grid cell.  And, when combined with the land suitability score and future land use category assignments, it established the order and supply available for a grid cell to receive future growth in the CommunityViz Model (anticipating impacts in 2040).

Development status was assigned to parcels in Berkeley County first using aerial photography, property appraiser data, and topic specific GIS data sets — existing land use, conservation holdings, etc.  Emphasis on one or more of the data sets varied by the development status category being coded, which is highlighted in the category descriptions that follow.

Development status categories used for the Berkeley County CommunityViz Model included:  open space, developed, undeveloped, under-developed, and

committed development.  A brief description of each category follows:

**Open Space** — Active or passive land dedicated to permanent or semi-permanent open space, including:  state parks, conservation areas, parks and recreation fields, open space opportunity areas, and land set aside for open space in residential neighborhoods, commercial centers, business parks, etc.  GIS data (parks and conservation easements) and land ownership information in the property appraiser database were used to assign open space status.  Future year growth was not allocated to areas identified as open space in Berkeley County.

**Developed** — Parcels largely built-out with permanent buildings or structures.  Developed status was also assigned to surface parking lots that serve adjoining buildings, or to sliver lots adjacent to developed parcels — appearing to be part of the same development or home site — where size, shape, or access limitations would generally keep them from developing in the future.  Aerial photography, GIS data (existing land use inventory and building footprints), and land ownership information in the property appraiser database were used to assign developed status.  Future year growth was not allocated to areas identified as developed in Berkeley County.

**Undeveloped** — Parcels without permanent buildings or structures.  Undeveloped status was also assigned to parcels with temporary structures that could easily be removed to accommodate new development in the future.  Aerial photography, GIS data (vacant lands inventory and building footprints), and land ownership information in the property appraiser database were used to assign undeveloped status.  Future year growth was allocated to areas identified as undeveloped in Berkeley County.

**Under-developed** — Parcels with permanent buildings or structures that occupy only a portion of the property leaving area(s) available for future development.  For this analysis, the test was limited to space efficiency on the property, and the condition of buildings or structures was not a consideration.  Aerial photography and GIS data (existing land use inventory and building footprints) were used to assign under-developed status.  Future year growth was allocated to areas identified as under-developed in Berkeley County.  Existing uses or buildings on the parcels were assumed to remain on the parcel as future growth was added to the area.

**Committed Development** — Lots or parcels that have been approved for development but not yet built in the planning area as of June 16, 2020.  The Berkeley County CommunityViz Model did not allocate additional future growth to these areas beyond what was hard-coded from the County's committed development inventory.

## Future Land Use Categories

Future land use assignments in CommunityViz tell the Model which set of equations to use for estimating the development yield (build-out potential) of a grid cell.  When combined with the land suitability score it establishes the order and supply available for a grid cell to receive future growth in the planning area.

The scenarios used the same future land use categories in different combinations to describe preferred development types, locations, patterns, and intensities for the planning area.  The future land use category system was adopted with slight modifications from versions used for other fast-growing areas in the Southeast United States.

| **Open Space** | **Rural Living** | **Suburban N** |
|---|---|---|
|  |  |  |
| Permanent Open Space | Rural Residential | Mobile Home C |
| Recreation Open Space | Working Farm & Forestland | Large-Lot Resi |
| | Rural Crossroads | Small-Lot Resi |
| | | Mixed-Density |
| | | Master Planned |
| | | Town Home Co |
| | | Multifamily Co |

# Future Land Use Categories Considered for the FLUM in Berkeley County...

## Future Land Use Category Descriptions

Permanent Open Space — land used for passive or semi-passive purposes.  More passive areas are represented by undisturbed or undeveloped land protected from future subdivision or development by federal, state, county, or town entities, or by public, private, or non-profit organizations.  The areas may be preserved because of their outstanding natural beauty, environmental sensitivity, stormwater management benefits, viewsheds, or the protection of wildlife management areas.  Examples of passive open spaces may include, but are not limited to, preservation or conservation easement areas, natural parks or preserves, cemeteries, or land dedicated as passive open space within residential neighborhoods, non-residential centers, or mixed-use activity centers.  More active open

| | Suburban Centers | Walkable Activity Centers |
|---|---|---|

**Community**

**dential**

**dential**

**Neighborhood**

**Community**

**ommunity**

**mmunity**

| Retail | Neighborhood Commercial |
| | Highway Commercial |
| Office | Civic or Institutional |
| | Office |
| Industrial | Light Industrial |
| | Heavy Industrial |
| | Mega Industrial |

Urban Neighborhood

| Mixed-Use Centers | Neighborhood Activity Center |
| | Innovation Center |
| | Community Activity Center |
| | Regional Activity Center |

Transit-Oriented Development

Municipal Centers (Downtowns)

space in the category is used for greenways, or trails.  Facilities may be operated by county, town, or city government; non-profit organizations; or private sports clubs.

**Recreational Open Space** — land dedicated for active recreation uses.  These areas are intended to be publicly-accessible.  In Berkeley County, these areas include

municipal and community parks, open air sports complexes, and athletic fields.

**Rural Residential** — land characterized by large lots, abundant open space, and a high degree of separation between buildings.  Large acreage, rural family homes, and "hobby farms" are scattered throughout the countryside and often integrated into the landscape.  The lot size and distance between

dwelling units decrease with greater development densities.

**Working Farm and Forestland** — land actively used for agriculture or forestry activities, including cultivated farmland, timber harvest, livestock, and woodlands.  These areas may also support the primary residence of the property owner and any out-buildings associated with activities on the working farm.

**Rural Crossroads** — land used within small nodes of commercial activity — gas stations, convenience stores or restaurants — that are concentrated at rural crossroads, serving some daily needs of the surrounding rural population.

**Mobile Home Community** — land used as a community for prefabricated homes, often called manufactured or mobile homes.  Most homes are fixed to the ground and difficult to move without specialty equipment.  These communities may range from a half dozen to over 100 units.  The most common model assumes that the parcel is owned by a single entity, renting the land and providing hookups to owners of the housing structures themselves.  While mobile home parks are fixtures of the existing landscape, they are generally not assumed to expand in the future.

**Large-Lot Residential** — land generally formed as subdivisions, which consist almost entirely of single-family detached homes.  Lots are generally larger than 30,000 square feet (0.69 of an acre).  Buildings are oriented interior to the site and are typically buffered from surrounding development by transitional uses, topography, or vegetative areas.  Many neighborhoods 'borrow' open space from adjacent rural or natural settings.  Blocks are typically large, and streets are rural or suburban in character.

**Small-Lot Residential** — land generally formed as subdivisions, which consist almost entirely of single-family detached homes.  Lots are generally smaller than 30,000 square feet (0.69 of an acre).  Buildings are oriented interior to the site and are typically buffered from surrounding development by transitional uses, topography, or vegetative areas.  Many neighborhoods 'borrow' open space from adjacent rural or natural settings.  Blocks are typically large, and streets are rural or suburban in character.

**Mixed-Density Neighborhood** — land formed as a neighborhood that includes several housing types — single dwelling detached, townhome, condominium, apartment, and/or senior living — that provide a range of home choices (densities) in the same neighborhood.  This mixed approach allows residents at all stages of life, with different housing needs and preferences, to live in a multi-generational community for a lifetime.  Residents can start in a smaller, less expensive option like an apartment or townhome early in life, and move to larger detached single dwelling homes on larger lots as their families grow and change.  Empty nesters can downsize to a townhome or senior living option without leaving the neighborhood.

In a mixed-density neighborhood, homes are oriented toward the street with on-street parking in front of more dense housing options.  Some neighborhoods may mix housing types on the same block, or provide accessory dwelling units.  Small blocks and a grid street network support a well-connected, cohesive community.  New mixed-density neighborhoods include a comprehensive and connected network of open space that provides gathering space; preserves large tree stands; and helps manage stormwater run-off.  The neighborhoods are organized around a neighborhood-scale park that serves as a central gathering place, within a five-minute

walk of all homes in the neighborhood. Smaller open spaces like pocket parks and community gardens are distributed throughout the neighborhood and within a short walk of homes.

Density in the neighborhoods is highest around the central gathering place, where attached and multi-dwelling housing types like townhomes, apartments and condo buildings define the space. Moving out from the center, lots transition from smaller to larger, and become exclusively single dwelling. If a mixed-density neighborhood is built adjacent to an existing conventional neighborhood, the variation from more-dense to less-dense should provide an appropriate transition.

Mixed-density neighborhoods are primarily residential but may include limited civic or ancillary non-residential uses.

**Master Planned Community** — a master planned community in Berkeley County — Cainhoy Peninsula, Carnes Crossroads, etc. — where the planned unit development (PUD) process approved a specific combination of residential and commercial uses. In most communities, the uses are not integrated and commercial uses are oriented towards automobile travel for local residents.

**Town Home Community** — land generally developed to provide pockets of greater residential density, often in locations that create a transition between commercial or mixed-use areas and small-lot or large-lot single family neighborhoods. The more-dense development intensities help provide "rooftops" to support nearby suburban commercial, suburban office, or suburban mixed-use centers.

**Multifamily Community** — land generally formed as complexes or communities, with a

relatively uniform housing type and density throughout. They support the highest residential density in the suburban landscape, and may support condominiums or apartments.

Multifamily neighborhoods are found in close proximity to suburban commercial, suburban office, and suburban mixed-use centers, which helps provide the consumers and employees needed to support these centers. Buildings are oriented interior to the site and typically buffered from surrounding development by transitional uses or landscaped areas. Large parking lots and low street connectivity are common in suburban multifamily neighborhoods.

**Neighborhood Commercial** — land supporting small scale, neighborhood commercial centers that provide goods and services to surrounding neighborhoods. Their proximity to neighborhoods requires that operations be low-intensity, unobtrusive, and at a scale and design compatible with nearby residential development. The design of neighborhood commercial centers transitions effectively between residential and nonresidential uses and includes safe and convenient pedestrian and bicycle access for nearby residents.

**Highway Retail** — land supporting the daily needs of surrounding suburban residential neighborhoods and communities. They typically locate near high-volume roads and key intersections and are designed to be accessible primarily by automobile. Buildings are set back from the road behind large surface parking lots with little connectivity between adjacent businesses. Common types of suburban centers in the planning area include: multi-tenant strip centers, big box stores, small outparcels with a drive-through, and large shopping malls.

**Civic or Institutional** — land that supports a large diversity of civic and institutional uses, including, but not limited to, health care campuses, educational facilities, places of worship, and other government or private non-profit sites. These areas vary in size and scale, from large regionally-oriented hospitals and major educational centers to churches next to a residential neighborhood. While primarily for government or non-profit entities, some commercial, office, or light industrial uses on the site are not uncommon.

**Office** — land supporting opportunities to concentrate employment in the study area. They include both large-scale isolated buildings with numerous employees as well as areas containing multiple office uses that support and serve one another. They are typically buffered from surrounding development by transitional uses or landscaped areas and are often located in close proximity to major highways or thoroughfares.

**Light Industrial** — land supporting opportunities to concentrate employment in the study area on normal workdays. Each center generally supports manufacturing and production uses; including warehousing, light manufacturing, medical research, and assembly operations. These areas are found in close proximity to major transportation corridors — highway or rail — and are generally buffered from surrounding development by transitional uses or landscaped areas that shield the view of structures, loading docks, or outdoor storage from adjacent properties.

**Heavy Industrial** — land supporting large-scale manufacturing and production uses; including assembly and processing, regional warehousing and distribution, bulk storage, and utilities. These areas are found in close proximity to major transportation corridors —

— highway or rail — and are generally buffered from surrounding development by transitional uses or landscape areas that increase in size as development intensity increases.

**Mega Industrial** — a special category with some similarities to heavy industrial centers. These lands support very large-scale manufacturing and production uses, but may also encompass military facilities with which they share some characteristics. These areas support thousands of employees on very large sites making them regional hubs of employment. In Berkeley County, this classification is limited to two sites: Joint Base Charleston and Camp Hall Commerce Park.

**Urban Neighborhood** — land supporting a mix of moderate- to high-density housing options. These neighborhoods are relatively compact and may contain one or more of the following housing types: single family detached (small lots), townhomes, condominiums, or apartments. Buildings are generally oriented toward the street. The design and scale of development in an urban neighborhood encourages active living with a complete and comprehensive network of walkable streets.

**Neighborhood Activity Center** — land that provides goods and services to surrounding neighborhoods at a limited scale. Their proximity to existing neighborhoods requires that commercial operations be low-intensity, unobtrusive, and at a scale and design compatible with nearby residential development.

The design of neighborhood activity centers transitions effectively between residential and non-residential uses. Buildings on small blocks may stand up to three stories tall and encourage active public spaces between buildings. Public spaces are sized and

designed to be small gathering places for surrounding neighborhoods.  Residential units or office space may be found above storefronts.  Homes in and surrounding the center of development may offer several choices to live and experience the activity center, including, but not limited to, "missing middle" home choices such as single dwelling homes on small lots, townhomes, duplexes, triplexes, and quadplexes or accessory dwelling units.  Residential uses in a neighborhood activity center are secondary to commercial uses in terms of the size, scale, footprint, and intensity of development.

Parking is satisfied using on-street parking and shared rear-lot parking strategies.  Sites should effectively minimize the impact of cut-through traffic on nearby neighborhood streets by orienting vehicle access and circulation away from adjacent neighborhoods.  Neighborhood activity centers should also maximize their connections to an open space network, including safe and convenient pedestrian and bicycle access to the centers from nearby neighborhoods.

**Innovation Center** — land that abandons the idea of a conventional industrial park in favor of a mixed-use village that concentrates employment uses in a discernible center surrounded by one or more neighborhoods that support a variety of home densities and choices — including live-work units in the employment center.  The design, scale, character, and intensity of development in an innovation center emphasizes technology, creativity, and innovation, and may support a corporate headquarters, research and development campus, manufacturing center, or other centers of excellence and the nearby retail businesses and housing options needed for its employees.

A grid network of walkable streets connects destinations within the employment center and the surrounding neighborhoods.  Connected open space throughout the center accommodates recreation facilities, small parks, greenways, and gathering places; preserves tree stands; and helps reduce stormwater runoff.

**Community Activity Center** — land offering the opportunity to serve broader economic, entertainment, and housing needs in the community.  Land uses and buildings on small blocks may stand up to five stories tall and encourage active public spaces between buildings.  Residential units or office space may be found above storefronts.  Homes in and surrounding the center of development may offer several choices to live and experience the Activity Center, including, but not limited to, "missing middle" home choices such as single dwelling homes on small lots, townhomes, duplexes, triplexes, and quadplexes or accessory dwelling units.  Parking is satisfied using on-street parking, structured parking, and shared rear-lot parking strategies.  The compact, walkable environment and mix of residential and non-residential uses in the center supports multiple modes of transportation, including the potential for moderate transit-oriented development if-when-where a decision is made to invest in premium transit along major transportation corridors in the County.  Residential uses in a community activity center are secondary to commercial uses in terms of the size, scale, footprint, and intensity of development.

A larger community activity center may include one or more mixed-density neighborhoods with it, which provide additional nearby home choices and encourage active living with a comprehensive and interconnected network of walkable streets.

**Regional Activity Center** — land identified as a hub for entertainment or employment located immediately off Interstate 26 or near Hanahan and Daniel Island. The three areas are envisioned as "energized" centers containing a mix of business, entertainment, civic, and cultural activities, and a mix of housing types within and surrounding the centers. As a magnet to surrounding towns and neighborhoods, the areas become iconic symbols and exciting focal points in southern Berkeley County. Buildings may stand two to six stories tall in the immediate center of the development, and the public spaces between buildings should be designed for active uses, community gatherings, and interesting street life. Residential units or office space may be found above storefronts. Parking should be satisfied using on-street parking, structured parking, and shared rear-lot parking strategies.

The design, scale, character, and intensity of development in this area should be compatible with, and transition to, adjacent land uses. The character of existing adjacent neighborhoods should be preserved. Residential uses in a regional activity center are secondary to commercial uses in terms of the size, scale, footprint, and intensity of development.

**Transit-Oriented Development** — a transit-oriented development center for bus rapid transit (BRT) includes a concentration of mixed-use, dense buildings focused around a premium bus transit stop. Uses and buildings are located on small blocks with streets designed to encourage bicycle and pedestrian activity. The highest density development is located within ¼-mile of the transit station, with progressively lower densities spreading out into neighborhoods surrounding the center.

**Municipal Centers (Downtowns)** — land inside the downtown of cities, towns, or unincorporated communities in Berkeley County that functions as a destination for residents and visitors to the area. They support a compact development pattern with a mix of land uses (horizontal and vertical), high-quality building architecture, plazas and public spaces, and civic destinations that promote social interaction and celebrate the individual community. Uses and buildings are located on small blocks with streets design for walking first, and driving second. Buildings may stand one to ten stories tall and include civic, retail, office, restaurant, residential, or entertainment uses. Condominiums, apartments, or offices may be found above storefronts. Parking is satisfied using on-street parking, structured parking, and shared rear-lot parking strategies.

Areas immediately adjacent to a downtown core may transition between the most intense development areas in a city, town, or unincorporated community and the stable, near-in neighborhoods and businesses that surround the downtown cores. The transition area supports a mix of land uses, architectural continuity, public spaces, and opportunities for social interaction. Uses and buildings are located on small blocks with streets designed for safe and efficient walking between nearby destinations.

## Carrying Capacity

Some land in Berkeley County will never develop because of physical conditions on the site, land ownership, or the existence of state and local policies that prohibit development. These areas — referred to as highly-constrained for development in the model — were removed from the planning area to more accurately approximate buildable area in Berkeley County. Features used to represent

areas highly-constrained for development in the Model include: water bodies, wetlands (derived from SCGAP vegetation classes representing permanently inundated areas), national forests, protected natural areas, rights-of-way, and county or local parks.

A site efficiency factor specific to each future land use category was applied to grid cells coded either 'undeveloped' or 'under-developed' in the planning area to account for land typically set aside for on-site improvements — internal streets, utility easements, storm water management, and open space — needed to support new (or expanded) development. The portion(s) of a grid cell remaining after the removal of highly-constrained areas for development and the application of factors for on-site infrastructure were used to approximate buildable area for the planning area.

## External Link Tables

Some variables and values used in the calculations for CommunityViz were linked to the analysis via external lookup tables, which update automatically every time a change is made outside the software. The tables were used to capture general development characteristics associated with the different future land use categories, and enumerate dwelling unit, population, non-residential square feet, and employee growth forecasts for the allocation process.

The general development lookup table was linked to the Berkeley County CommunityViz Model using future land use categories described earlier in the report. Build-out potential factors calculated in the lookup table streamlined calculations inside CommunityViz by multiplying factors outside the model environment. Information in the lookup table was summarized under sixteen column

headings, including: future land use category name, future land use category code, site efficiency factor, percent residential uses, percent non-residential uses, percent single family detached development, percent single family attached development, percent multifamily stacked development, percent general commercial development, percent office development, percent industrial development, average density, and average non-residential floor area ratio.

The growth forecasts (control totals) lookup table for dwelling units, population, non-residential square feet, and employees was used to store future year growth assumed for the project horizon period, 2020 to 2040. Dwelling unit data was reported for single family detached, single family attached, and multifamily stacked categories. Square feet and employee data was reported for general commercial, office, and industrial categories.

## Build-Out Potential Analysis

Build-out potential in CommunityViz quantified the type, location, and intensity of development for a theoretical condition where all land available in the planning area was developed. Build-out potential calculations for dwelling units and non-residential square feet simulated a theoretical condition where all grid cells in the Berkeley County were assigned 'undeveloped' or 'under-developed' were (re)developed consistent with assigned future land use categories and their development lookup table values. Internal scripts in the software started with buildable area from the carrying capacity analysis and applied rules for land use mix, density, or intensity from the general development external lookup table to approximate a maximum number of new dwelling units or non-residential square feet for the grid cells (and sometimes a mix of both categories).

Build-out potential statistics were summarized for eight development categories: single-family detached dwelling units, single family attached dwelling units, multifamily stacked dwelling units, general retail square feet, office square feet, and industrial square feet. This information was used to represent the available supply for the growth allocation scripts in CommunityViz described below.

## Land Suitability Analysis

Land suitability analysis (LSA) in a GIS environment measures the appropriateness of an area for a specific condition or use. For Berkeley County, it was used to focus future development in the planning area based on a variety of factors. The LSA in CommunityViz has two components, with multiple factors associated with each. The first component influences the attractiveness for future residential growth. The second component influences the attractiveness for future non-residential growth.

The LSA uses a normalized scale (between 0 and 100) to rank the grid cells from least to most suitable for future development. For the Trend Development and Accelerated Trend Development Scenarios, the LSA factors were selected and weighted to orient growth towards areas of recent and committed growth. This influenced future year growth in areas where the market is currently choosing to develop, and to a certain extent where it is likely to develop in the near future. Other LSA factors such as proximity to infrastructure, roads, and intersections contributed to the calibration of the LSA. The Managed Growth Scenario used an LSA that included new factors that represented proximity to new activity centers and development nodes, as well as existing municipalities.

## Growth Allocation

Growth forecasted for Berkeley County was allocated to grid cells using the Allocator 5 Application in CommunityViz. More details about growth forecasted for the planning area (control totals) is provided in the next section of the report. The tool helped determine where growth would likely occur using a supply-and-demand approach and a series of probability-based algorithms internal to the software.

The allocation application used a "randomness" factor of 2 (available settings range from 0 = strict order, follow LSA scores only to 10 = totally random, ignore LSA scores completely). This setting assumed a conservative amount of growth would locate in the county-wide planning area irrespective of the land suitability analysis scores. Information from previous steps in the modeling process — build-out potential analysis, land suitability analysis, and growth forecasts — was fed directly into the application for completing the allocation processes.

Data was summarized for eight development categories — single-family detached dwelling units, single family attached dwelling units, multifamily stacked dwelling units, general commercial square feet, office square feet, and industrial square feet — over a twenty-year horizon period (2020 to 2040).

## Berkeley County Likely Impacts Model

The Berkeley County Likely Impacts Model (using Microsoft Excel) was used to describe potential future year development characteristics and likely impacts to infrastructure associated with the four growth scenarios considered for the analysis.

Conditions were reported for the twenty-year planning horizon, 2020 to 2040. The Model included four major components: development and future land use category inputs, revenue generation, potential infrastructure needs, and return-on-investment (ROI) potential. Each of the components are described in more detail below:

## Development and Future Land Use Category Inputs

Tables were exported from the Berkely County CommunityViz Model that summarize where and how much development was occurring throughout the County for each of the alternative growth scenarios. Data for revenue calculations was input both as acres by future land use category by jurisdiction and development types (e.g., residential and/or non-residential types) by jurisdiction. Data for expenditure categories was input as residential totals by districts which reflect the administration of the seven different infrastructure categories: fire protection, police protection, emergency medical services, parks, roads and stormwater, water and sewer, and public education.

## Revenue Generation

This component estimates several broad types of revenue generated locally by the County: ad valorem tax revenue and special fees. For ad valorem tax revenue, the acres by future land use category by jurisdiction information (described above) was multiplied by the average assessed value per acre, millage rates, and assessment rates while making adjustments for Joint Industrial Parks, where applicable. The development types by jurisdiction data were multiplied by the County's system of special fees. Special fees are often applicable dependent on the

location of the development. That is, the tool estimates special fee revenue based on municipality, special district, contract fire arrangement, incorporated and unincorporated status. This revenue is estimated for both residential and non-residential development. Assumptions and inputs for the Revenue Generation section, including millage rates, assessment ratios, special fees and other adjustments are described in the technical appendix.

## Potential Infrastructure Needs

Potential infrastructure needs were calculated for the alternative growth scenarios using seven categories considered most sensitive to future year growth and development decisions: public education, fire protection, police protection, emergency medical services, parks, water and sewer service, and vehicle trip generation. All infrastructure categories in the Likely Impacts Model share some similar methodology for anticipating expenditures focused on 1) the operations, maintenance, and replacement costs for existing resources, and on 2) the construction, operations, maintenance, and replacement costs for new resources identified to serve future growth and development in the County for the twenty-year planning horizon (2020 to 2040). The inventory of existing resources in each category — buildings, structures, parks, trails, streets, pipes, pump stations, vehicles, equipment, and personnel — and their associated operation, maintenance, and replacement costs were based on information presented in the baseline infrastructure assessment. A copy of the baseline infrastructure assessment is summarized in the technical appendix.

While all infrastructure categories are sensitive to where future development occurs, some employ additional information available in the

Berkely County CommunityViz Model.  Four of the infrastructure categories — roads and stormwater, water and sewer service, parks and fire protection — used a similar methodology for anticipated future year needs generated by the alternative growth scenarios.  This method accounts for where existing infrastructure is and can discount the need for new infrastructure based on the new development's proximity to existing infrastructure.  For example, the number of new parks needed to serve future growth and development in the County was estimated using the number and location of new dwelling units allocated in the CommunityViz Model, and a map of half mile service areas for existing shared-use parks and recreation facilities created for the new Comprehensive Plan.  New residents allocated outside of the half mile services areas will require new parks while residents within the service area will not (because parks are already near the new residents).

Other infrastructure type anticipated in the County — police protection, public education and emergency medical services — were multiplied by current service delivery standards specific to each infrastructure category to determine potential future year infrastructure needs.  For example, the number of new police officers needed to serve future growth and development in the County was calculated based on the number of new residents anticipated for each scenario, and the need to maintain a service delivery standard of police protection per new resident.

While both methods are sensitive to the overall amount of growth, the latter method is less sensitive to where development occurs.  In scenarios with matching forecast totals, there is little to no difference reported in term of impacts for these infrastructure categories.

In a few cases, such as emergency medical services, the County is the sole provider of that service.  However, in most other cases, infrastructure is provided by a rural fire department, municipal police department, or municipal water utility to provide a few examples.  The model captures impacts to these non-County entities and estimates costs, which are reported in the technical appendix.

## Return-on-Investment Calculation

Total revenues and total expenditures anticipated for the alternative growth scenarios were calculated from the revenue and expenditure categories presented in this section of the report.  Information was presented in terms of annual, reoccurring revenues and expenditures for the final year of the twenty-year planning horizon (2040).  Full build-out for one or more of the growth scenarios considered for the Scenario Planning and Likely Impact Analysis is likely to occur in different years based on the type, location, and intensity of development assumed (and definitely after the 2040 planning horizon for this analysis).

The ratio of annual revenue in the numerator to annual expenditures in the denominator for each growth scenario represented its return-on-investment index.  An index greater than 1.0 indicated annual revenues were greater than annual expenditures, and the surplus would be available to the County to finance new construction or purchase new capital projects to serve the planning area.

A factor was applied to the County's General Fund before the ROI calculations were performed to isolated revenues sensitive to different growth and development patterns (i.e., ad valorem tax and special fees).  Revenue categories beyond the scope of this analysis — fines, fees, sales tax, and state

pass-down funding among others — were held constant for all four growth scenarios.

## Future Applications of the Berkeley County Likely Impacts Model

The Berkeley County Likely Impacts Model was built specifically to support the new Comprehensive Plan, and its analysis of needs, revenues, and costs associated with growth and development over a twenty-year planning horizon, 2020 to 2040.  However, the Model was also adapted after the project to use for individual development application assessments, which the County may use in the future to enumerate impacts using the same rates, coefficients, and equations used for the original project.  Specific cells in the Model are available to input individual development application data, and calculations are performed in real-time to share with project stakeholders.

# Growth Anticipated for the Planning Horizon, 2020 to 2040

The sections that follow discuss two types of future growth — committed development and total forecasted growth — considered for the scenario planning and likely impacts analysis.

## Committed Development

Committed development consists of development that has been "entitled" or approved for development. A committed development project is typically either anticipated to start soon, or in some cases where early phases of a development have begun and are anticipated to continue in the future.

The committed development inventory for this analysis includes a full range of development projects monitored by Berkely County — from the small (less than 10 dwelling units) to the very large (greater than 10,000 dwelling units). Most projects are residential in nature; however, a few include commercial or industrial uses.

While committed development is likely to occur in the future because of the investments made by a land owner or the developer, full build out of the entitlement it is not always certain for a variety of reasons (e.g., changing market trends, developer financing, project per forma, etc.). For these reasons, staff for Berkeley County and their partners provided the consultant with statistics to assume for committed development over the twenty-year planning horizon that were adjusted for market trends or project confidence. This information is consistent with a GIS layer created to track committed developments

throughout the county (i.e., the shapefile named Proposed Developments). Information from the GIS layer was summarized for the six growth forecast categories (control totals) assumed for the scenario planning and likely impacts analysis.

| Committed Development | Quantity |
|---|---|
| Single-Family Detached | 38,929 du |
| Single-Family Attached | 3,717 du |
| Stacked Multifamily | 7,000 du |
| General Commercial | 855,260 sf |
| Office | 466,140 sf |
| Industrial | 2,573,060 sf |

## Growth Forecasts

Long-term growth forecasting is an inherently uncertain business, typically conducted by demographers using multiple sources of data. It is particularly challenging in areas that are growing quickly like Berkeley County. Indeed, short term forecasts of residential growth developed in the past ten to fifteen years have always been exceeded by the actual amounts of growth experienced in Berkeley County or its municipalities.

The consultant relied heavily on the expertise of staff at the Berkeley-Charleston-Dorchester Council of Governments for growth forecast information to include in this analysis. Four data sets were consulted to determine the most appropriate growth forecasts (control totals) to assume for each of the four alternative scenarios:

- Socioeconomic data from the CHATS Regional Travel Demand Model, which is a computer program that forecasts future year demand on existing and planned transportation facilities using anticipated land use, demographic

*Fishing Huger Creek. Photo by D.D. Devot (1962). Wikimedia Commons.*

information, and travel patterns unique to the study area.

- Berkeley County building permit data for the last three years, 2018 to 2021, and an average household size of 2.60 persons per household from the U.S. Census Bureau.

- Population forecasts for Berkeley County published by the South Carolina State Department of Revenue and Fiscal Affairs for 2035, where were extrapolated to 2040 using a straight-line trend.

- Committed development and future opportunities tracked by the Berkeley County Economic Development Department to validate/calibrate information from the three previous sources.

Future year residential growth was different across the four scenarios. Scenario A (Committed Development) assumed the lowest growth forecast (122,000 new residents), which was grounded in the committed development inventory maintained by Berkeley County and household size statistics from the U.S. Census Bureau. Scenario B (Trend Development) assumed the second lowest growth forecast (170,000 new residents), which was calculated using Berkeley County building permit data for the last three years, 2018 to 2021, and an average household size of 2.60 persons per household from the U.S. Census Bureau.

Scenarios C (Accelerated Trend Development) and D (Managed Growth) assumed the same future year residential growth: 239,000 new residents. This statistic started with information in the CHATS Regional Travel Demand Model for Berkeley County, which was factored down to reflect current thinking for the type and pace of development anticipated for committed projects in the planning area over the twenty-year planning horizon, 2020 to 2040. Residential growth forecasted for Scenarios B, C, and D are all greater than the statistics reported by the South Carolina State Department of Revenue and Fiscal Affairs extrapolated to 2040 (i.e., 143,293 new residents).

The variation in residential growth forecasted for the planning area between the four scenarios allowed testing of different demand levels, which would be influenced by policies to manage the timing, location, and intensity of new development in the One Berkeley County Comprehensive Plan.

Future year employment forecasts for Scenario A were zero based on the committed development inventory assumed for this analysis. Employment forecasts for scenarios B, C, and D (74,500 new employees) were taken directly from the CHATS Regional Travel Demand Model, which was deemed valid by the County's Economic Development Department for the twenty-year planning horizon based on recent market trends.

Population and employment forecast data was summarized for three residential categories — single family detached, single family attached, and multifamily stacked — and three non-residential categories — general commercial, office, and industrial — for the scenario planning and likely impacts analysis. Future year residential growth was converted to dwelling units using a household size of 2.60 persons per unit. Future year non-residential growth was reported by square feet using employee space ratios tied to the BCDCOG Regional CommunityViz Model.

The dwelling units and non-residential square feet reported for Scenarios B, C, and D include the future year growth assumed for Scenario A

in all cases — meaning committed development is assumed constant through all four alternative futures. The table below summarizes future year growth (control totals) assumed for the scenario planning and likely impacts analysis.

Anticipated residential and non-residential growth associated with the committed development inventory (Scenario A) was subtracted from the dwelling unit and square feet statistics calculated for the County in Scenarios B, C, and D to represent new net growth for the allocation process in the Berkeley County CommunityViz Model (i.e., forecasted growth minus committed growth = net new growth for modeling purposes).

The large table below summarizes data for the residential and non-residential categories used in the analysis. The small table provides statistics for the base year, 2020, for comparison.

## Existing Development in Berkeley County, 2020

| Existing Development | Quantity |
|---|---|
| Population* | 229,861 |
| Employment** | 58,451 |

\* Census 2020
\*\* Census 2018 LEHD

## Future Year Development Assumed in Berkeley County by Scenario, 2020 to 2040

| Residential Forecast | Committed | Trend | Accelerated Trend | Managed Growth |
|---|---|---|---|---|
| Population 2040 | 351,861 | 399,866 | 468,861 | 468,861 |
| *Population Growth from 2020* | 122,000 | 170,000 | 239,000 | 239,000 |
| | | | | |
| Housing Growth by Unit Type | | | | |
| Single-Family Detached Dwellings | 38,929 | 57,500 | 80,700 | 58,300 |
| Single-Family Attached Dwellings | 3,717 | 4,200 | 5,700 | 19,400 |
| Stacked Multifamily Dwellings | 7,000 | 7,600 | 10,700 | 19,400 |
| Total New Housing Units | 49,646 | 69,300 | 97,100 | 97,100 |
| **Non-Residential Forecast** | | | | |
| Employment 2040 | | 134,993 | 134,993 | 134,993 |
| *Employment Growth from 2020* | | 74,500 | 74,500 | 74,500 |
| Employment Growth by Type | | | | |
| General Commercial Sq Ft | | 12,577,900 | 12,577,900 | 12,577,900 |
| Office Sq Ft | | 6,542,000 | 6,542,000 | 6,542,000 |
| Industrial Sq Ft | | 43,936,800 | 43,936,800 | 43,936,800 |

# Alternative Growth Scenarios

The consultant worked with the client and their partners to prepare four hypothetical growth scenarios to consider for developing the new Comprehensive Plan:
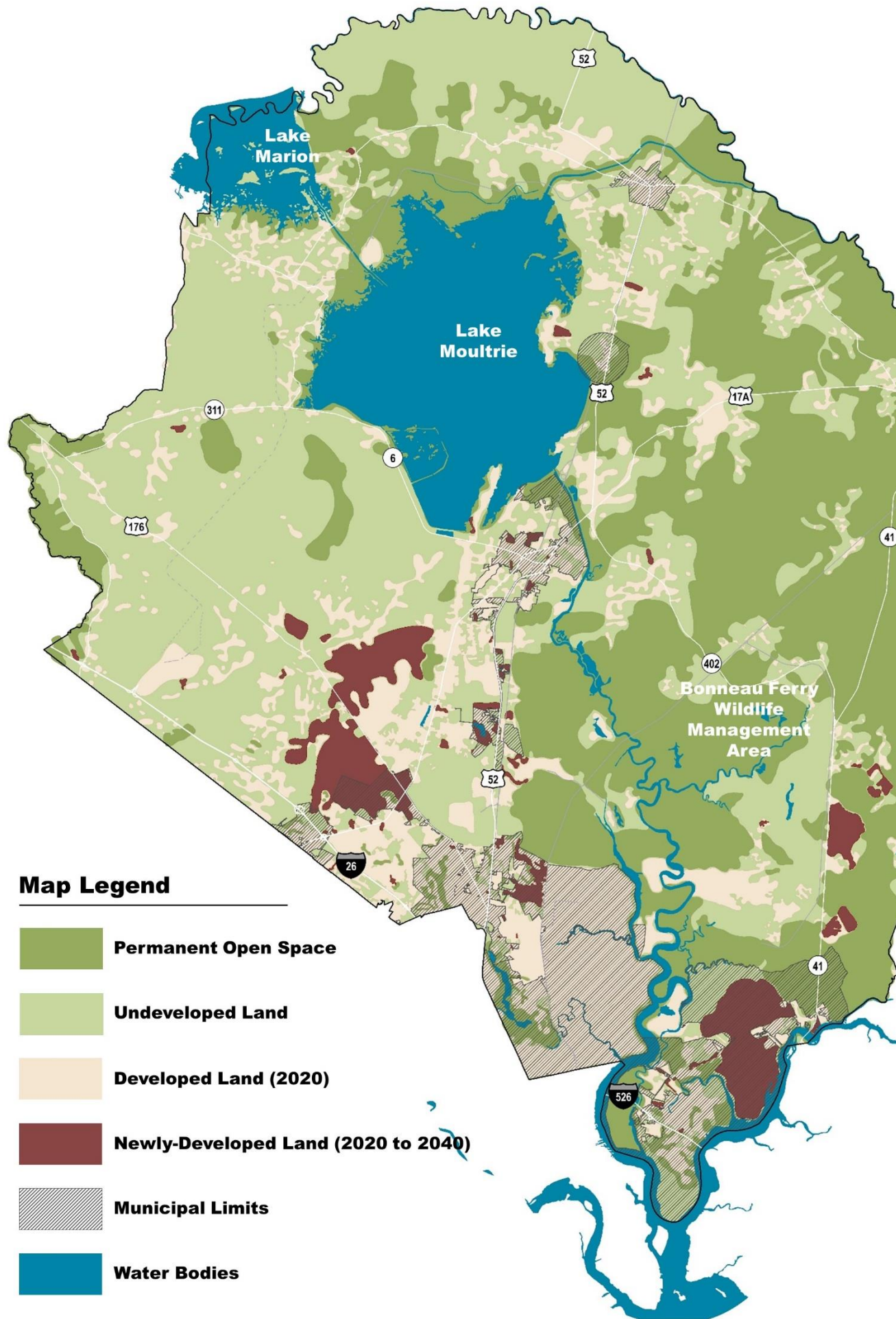
- Scenario A (Committed Development) — considers how the county might grow and develop if just the areas that have been "entitled" (approved for development) are built out to their fullest potential. No additional development beyond what is already entitled is assumed for the scenario.

- Scenario B (Trend Development) — considers how the County might grow if "business-as-usual" patterns of development were to continue.

- Scenario C (Accelerated Trend) — mimics Scenario B's "business-as-usual" approach to growth and development, but it uses a higher residential growth forecast for the allocation and evaluation process.

- Scenario D (Managed Growth) considers how the County might grow differently and consistent with public feedback received thus far during the planning process for the One Berkeley County Comprehensive Plan.

A concept map is presented for each scenario with a brief narrative summary, illustrative map, and list of factors driving future year outcomes. A second map for each scenario highlights intended growth areas for each alternative future. All four scenarios are compared side-by-side on page XX, which provides opportunities to compare and contrast the intended outcomes and measured impacts.
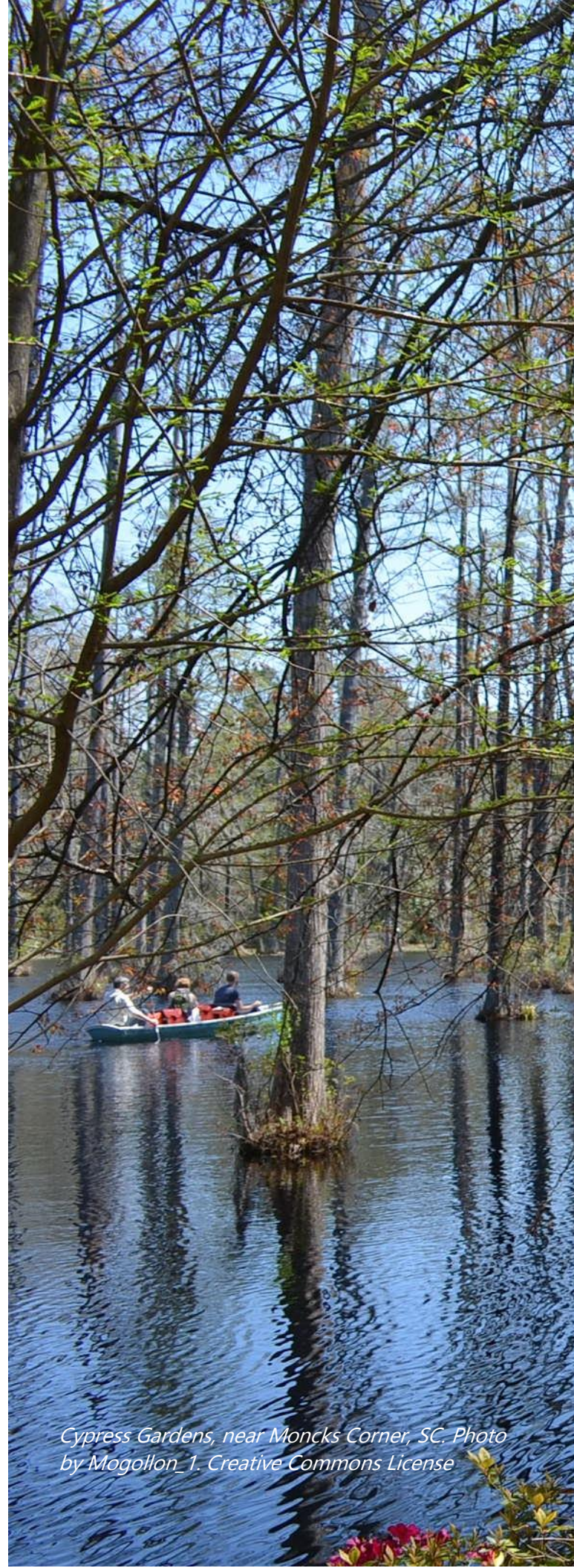
*Cypress Gardens, near Moncks Corner, SC. Photo by Mogollon_1. Creative Commons License*

Lake
Marion

Lake
Moultrie

Bonneau Ferry
Wildlife
Management
Area

**Map Legend**

Permanent Open Space

Undeveloped Land

Developed Land (2020)

Newly-Developed Land (2020 to 2040)

Municipal Limits

Water Bodies

# Scenario A: Committed Development

The Committed Development Scenario envisions the future of Berkeley County if areas that have been "entitled" are developed as fully-envisioned. This scenario helps answer the questions: **What if all the development that has currently been approved is actually built? What are the impacts from this development?** This scenario includes a full range of development projects from the small (less than 10 dwelling units) to the very large (greater than 10,000 dwelling units) with current zoning.

The magnitude and impacts of some committed developments are simply remarkable — some larger planned developments are much larger than most of the county's existing incorporated communities. While most committed development is residential, some include commercial or industrial uses as well. County staff maintains a list of committed developments, which is updated periodically to reflect current conditions. Future growth associated with committed development (uses and intensities) in the planning area are kept consistent for all growth scenarios studied for the One Berkeley Comprehensive Plan. While committed development is likely to occur in the future, it isn't always guaranteed to happen. Some developments build out as they were intended, while others may change plans and develop differently than originally planned. Some developments may never build out because of changing markets or problems securing financing.

**Francis Marion National Forest**

## Public Facilities & Services

The County and their partners have planned their services areas for water, sewer, and schools to serve committed development (entitled) projects. It is assumed capacity will exist at the time it is needed to serve the entitled development approved in various development master plans (or their development-phasing plans). It is also assumed cost-sharing strategies are in place to offset some expensive investments for the County to serve the developments.

## Rural Land

Rural land preservation becomes an unintended benefit for Berkeley County as a result of rules and policies that limit development to previously-approved projects. Confining growth areas for the planning horizon, in part because of limited available infrastructure capacities, reduces threats to surrounding landscapes.

## Environmental Stewardship

A significant amount of land in the County is permanently preserved as open space as of 2020. The amount of new open space preserved in the County remains relatively unchanged in the future if growth is not expanded beyond entitled development areas.

## Development Footprint

Single-use, suburban development patterns and intensities are common in committed development; exemplified by suburban neighborhoods, highway strip commercial, and large industrial buildings. Mixed-use, walkable activity centers are not prevalent, and primarily focused inside different municipal limits or a limited number of specific intersection nodes in the County.

## Jobs-Housing Proximity

Most employees will drive long distances for work. Only a few areas of the County may have jobs and housing located close enough together to realize expected benefits (i.e., shorter commute distances).

## Housing Mix

The County will see even more large-lot, single-family neighborhoods to meet future market demands — some of which may be in rural areas under current zoning. New neighborhoods would average fewer than three homes per acre.

## Viable Travel Options

Cars will be the primary mode of transportation for residents in the County. Investments in Interstate 26, various highways, and local roads will be needed to meet demands generated by the committed development. Transit remains a low-priority in the future.

Lake
Marion

Lake
Moultrie

Bonneau Ferry
Wildlife
Management
Area

**Large Concentration of Development**

The overwhelming majority of committed development noted for Berkeley County is focused on the area between Summerville, Goose Creek, and Moncks Corner. Major developments in this area include: Cane Bay, Nexton, Carnes Crossroads, and the Wildcat Tract. Together, these projects may account for over 20,000 new residential dwelling units over the twenty-year planning horizon, 2020 to 2040.

# Scenario A: Committed Development
## Intended Growth Areas

**41**

**Francis Marion National Forest**
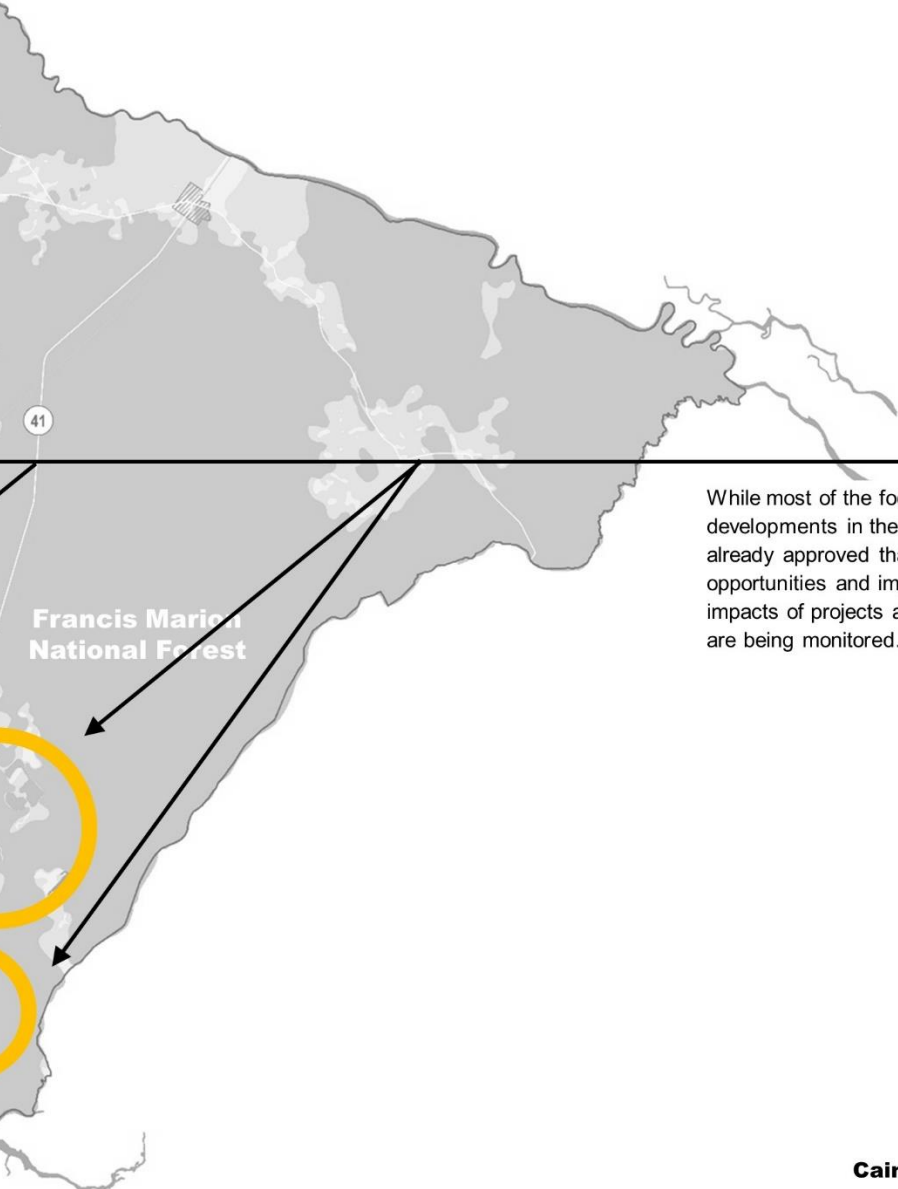
### Cumulative Impacts

While most of the focus is on build out of large, mega developments in the County, there are several smaller projects already approved that together will create measurable opportunities and impacts for the community. The cumulative impacts of projects along US Highway 52 and SC Highway 41 are being monitored.

### Cainhoy Plantation Development

Development inside the boundaries for Cainhoy Plantation will literally transform this area of Charleston and surrounding Berkeley County. 18,000 residential dwelling units are entitled in this location; however, County planning staff anticipated up to 11,000 units will be built over the twenty-year planning horizon, 2020 to 2040. Both opportunities and impacts from this development will be tremendous. Officials anticipated significant traffic congestion in the area — especially on and near Clements Ferry Road.
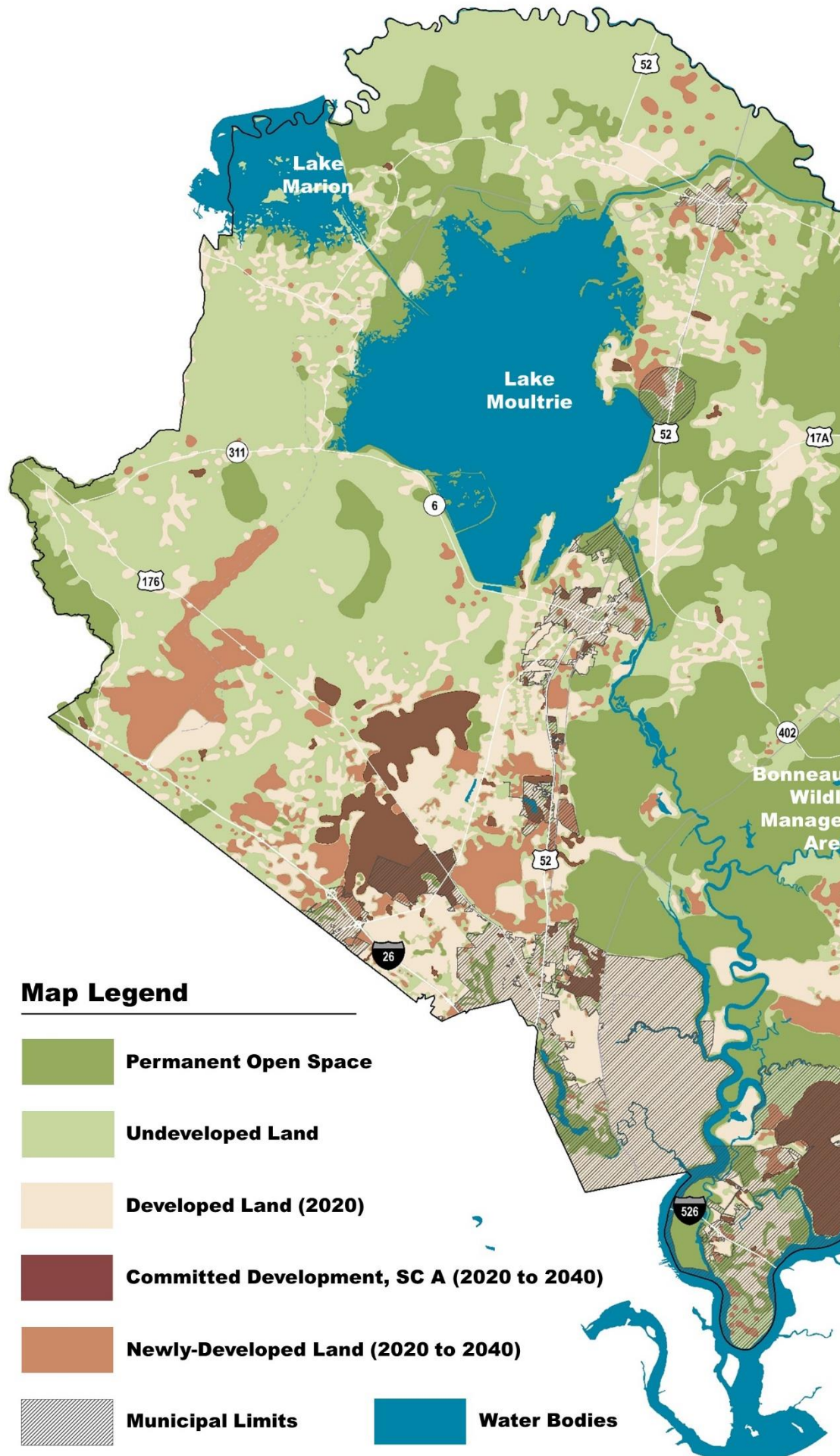
Lake Marion

Lake Moultrie

Bonneau Wildlife Management Area

## Map Legend

| | |
|---|---|
| ![green] | **Permanent Open Space** |
| ![light green] | **Undeveloped Land** |
| ![tan] | **Developed Land (2020)** |
| ![dark red] | **Committed Development, SC A (2020 to 2040)** |
| ![orange] | **Newly-Developed Land (2020 to 2040)** |
| ![hatched] | **Municipal Limits** |
| ![blue] | **Water Bodies** |

# Scenario B: Trend Development

The Trend Development Scenario considers how the County might grow if "business-as-usual" patterns of development were to continue. The Trend Scenario envisions population growing to 399,000 people. It includes the committed development from Scenario A and adds to it development that is forecasted to occur in the County by the year 2040. The additional development includes just under 20,000 more dwelling units and almost 60 million square feet more commercial, office, and industrial space.

The Trend Scenario helps answer the questions: **What if we keep developing in the ways that we've grown in the recent past? What are the impacts from this development?** The Trend Scenario envisions a number of changes to areas in the western half of the County. In particular, areas east of Camp Hall, along Interstate 26 and US Highway 176, would transform into a mix of industrial and low-density residential development. Facilitating industrial development is the expansion of the Palmetto Railroad, which will connect Camp Hall with railroad main lines in northern areas of the County.

Development in the Trend Scenario primarily consists of low-density residential place types: rural residential, and large and small lot residential in master planned communities. These areas will be highly dependent on cars for all transportation needs, and in many places will require extensive new infrastructure to serve an expanding development footprint. Impacts will be especially severe along US Highway 176 and SC Highways 52 and 41.

**Francis Marion National Forest**

### Public Facilities & Services

The County and their partners will expand their services areas for water, sewer, and schools to keep up with an expanding development footprint. Growth is not constrained by existing services areas, and expensive infrastructure investments will be needed to expand services areas and service capacity in the County.

### Rural Land

Rural land preservation is not a priority for Berkeley County. Significant land is lost to new development between 2020 and 2040, which compromises rural character in the County indicative of suburban sprawl.

### Environmental Stewardship

A significant amount of land in the County is permanently preserved as open space in 2020. The amount of new open space preserved in the County remains relatively unchanged in the scenario.

### Jobs-Housing Proximity

Most employees will drive long distances for work. Only a few areas of the County may have jobs and housing located close enough together to realize expected benefits (i.e., shorter commute distances).

### Development Footprint

Single-use, low-density development patterns and intensities spread throughout the County; exemplified by suburban neighborhoods, highway strip commercial, and large industrial buildings. Mixed-use, walkable activity centers are not prevalent, and primarily focused inside different municipal limits.

### Housing Mix

The County will see even more large-lot, single-family neighborhoods to meet future market demands. New neighborhoods in rural areas would average fewer than three homes per acre.

### Viable Travel Options

Cars will be the primary mode of transportation for residents in the County. Investments in Interstate 26 and various US and SC Highways will be needed to keep up with growth. Transit remains a low-priority in the scenario.

Lake
Marion

Lake
Moultrie

Bonneau Ferry
Wildlife
Management
Area

**Interstate 26 Development**

Industrial and commercial development
continues along the Interstate 26 corridor
until land is no longer available.

# Scenario B: Trend Development

## Intended Growth Areas

### Slow-Growth in Northern Communities

Most of the County's incorporated communities in the north – St. Stephen, Jamestown, and Bonneau – will see very little development pressures for the period between 2020 and 2040.

### Western Berkeley County Growth Pressure

Areas east of Camp Hall will develop in the future as infrastructure is extended in the area – in particular the Palmetto Railroad. Areas along US Highway 176 and Volvo Car Drive continue to transform into a residential and industrial enclave within the County.

### Development Around Large Planned Neighborhoods

The scenario assumes all committed development from Scenario A is completed, and new planned developments are attracted to the County, in part, because of their proximity to future employment areas.
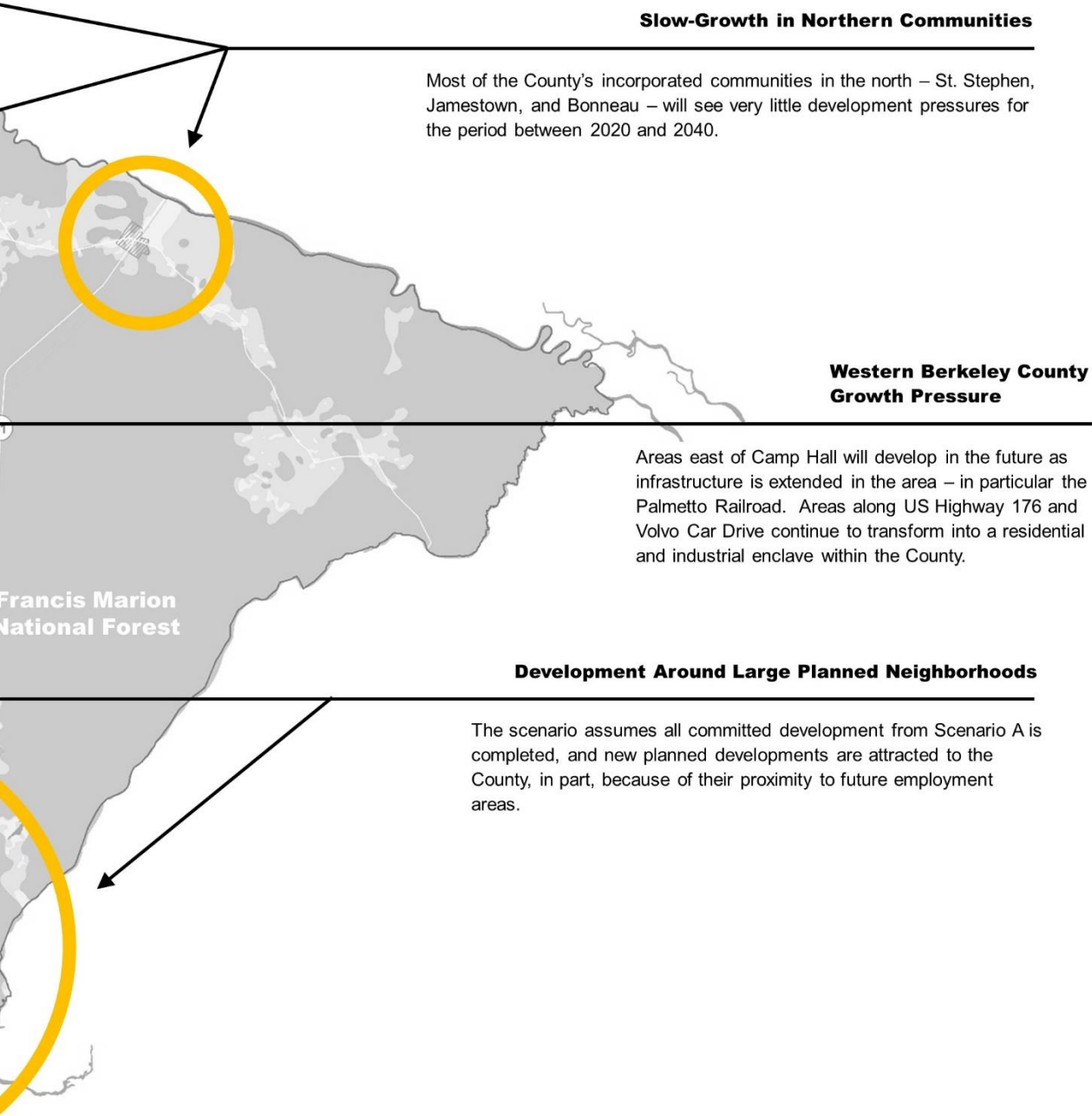
Francis Marion National Forest

**Map Legend**

| | |
|---|---|
| ■ (dark green) | **Permanent Open Space** |
| ■ (light green) | **Undeveloped Land** |
| ■ (tan) | **Developed Land (2020)** |
| ■ (dark red) | **Committed Development, SC A (2020 to 2040)** |
| ■ (orange-brown) | **Newly-Developed Land (2020 to 2040)** |
| ▨ (hatched) | **Municipal Limits** |
| ■ (teal) | **Water Bodies** |

Lake Marion

Lake Moultrie

Bonneau Ferry Wildlife Management Area

# Scenario C: Accelerated Trend Development

The Accelerated Trend Development Scenario mimics the Trend Development Scenario's "business-as-usual" approach, but uses a higher residential growth projection for the allocation process. This scenario envisions population growing to 468,000 people (compared to 399,000 people in Scenario B). As with the Trend Development Scenario, it includes the committed development inventory from Scenario A and adds new growth using the higher 2040 population projection. The additional development includes just under 50,000 dwelling units and almost 60 million square feet of non-residential space (non-residential forecast does not change compared to the Trend Development Scenario).

The Accelerated Trend Development Scenario helps answer the questions: **What if the County grows to a level near the maximum values in the forecasted range? What are the impacts from this level of increased development?** The Accelerated Trend Development Scenario envisions significant changes to areas in the western half of the County. Highway 176 and areas east of Camp Hall transform into another unincorporated community of 8,000 homes, similar to Cane Bay or other large master planned communities. Huger may also transform from a rural area to a suburban community of more than 4,000 homes.

As in the Trend Development Scenario, new development in the Accelerated Trend Scenario consists primarily of low-density residential place types: rural residential, and large and small lot residential in master planned communities. These areas will be highly-dependent upon cars for all transportation needs and in many places will require extensive new infrastructure (capacity and service area) to keep pace with demand.
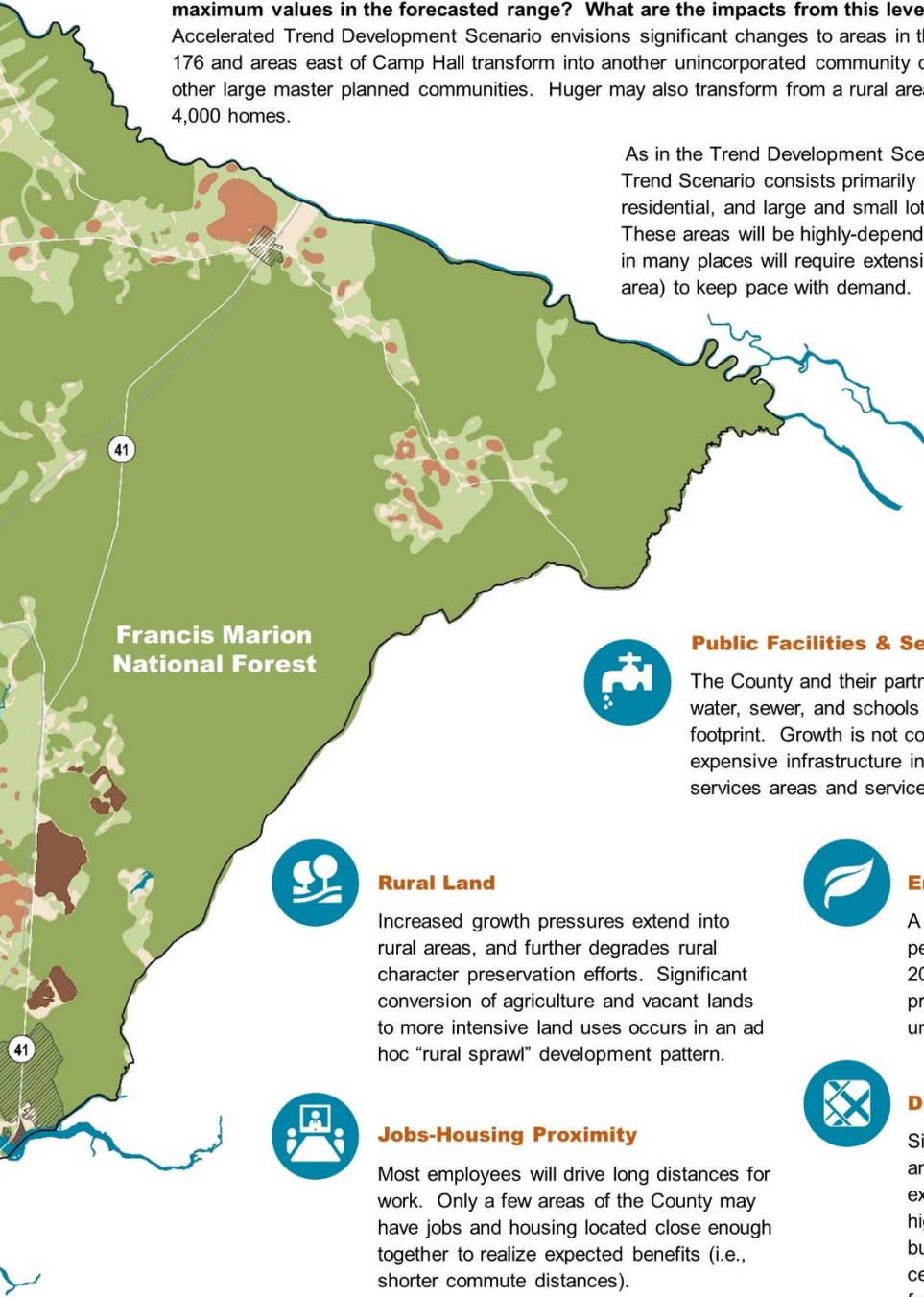
**Francis Marion National Forest**

41

41

## Public Facilities & Services

The County and their partners will expand their services areas for water, sewer, and schools to keep up with an expanding development footprint. Growth is not constrained by existing services areas, and expensive infrastructure investments will be needed to expand services areas and service capacity in the County.

## Rural Land

Increased growth pressures extend into rural areas, and further degrades rural character preservation efforts. Significant conversion of agriculture and vacant lands to more intensive land uses occurs in an ad hoc "rural sprawl" development pattern.

## Environmental Stewardship

A significant amount of land in the County is permanently preserved as open space in 2020. The amount of new open space preserved in the County remains relatively unchanged in this scenario.

## Development Footprint

Single-use, low-density development patterns and intensities spread throughout the County; exemplified by suburban neighborhoods, highway strip commercial, and large industrial buildings. Mixed-use, walkable activity centers are not prevalent, and primarily focused inside different municipal limits.

## Jobs-Housing Proximity

Most employees will drive long distances for work. Only a few areas of the County may have jobs and housing located close enough together to realize expected benefits (i.e., shorter commute distances).

## Housing Mix

The County will see demand for even more large-lot, single-family neighborhoods to meet future market demands. New neighborhoods would average fewer than three homes per acre.

## Viable Travel Options

Cars will be the primary mode of transportation for residents in the County. Investments in Interstate 26 and various US and SC Highways will be needed to keep up with growth. Transit remains a low-priority in this scenario.

Lake Marion

Lake Moultrie

Bonneau Ferry Wildlife Management Area

**Interstate 26 Development**

Industrial and commercial development continues along the Interstate 26 corridor until land is no longer available.

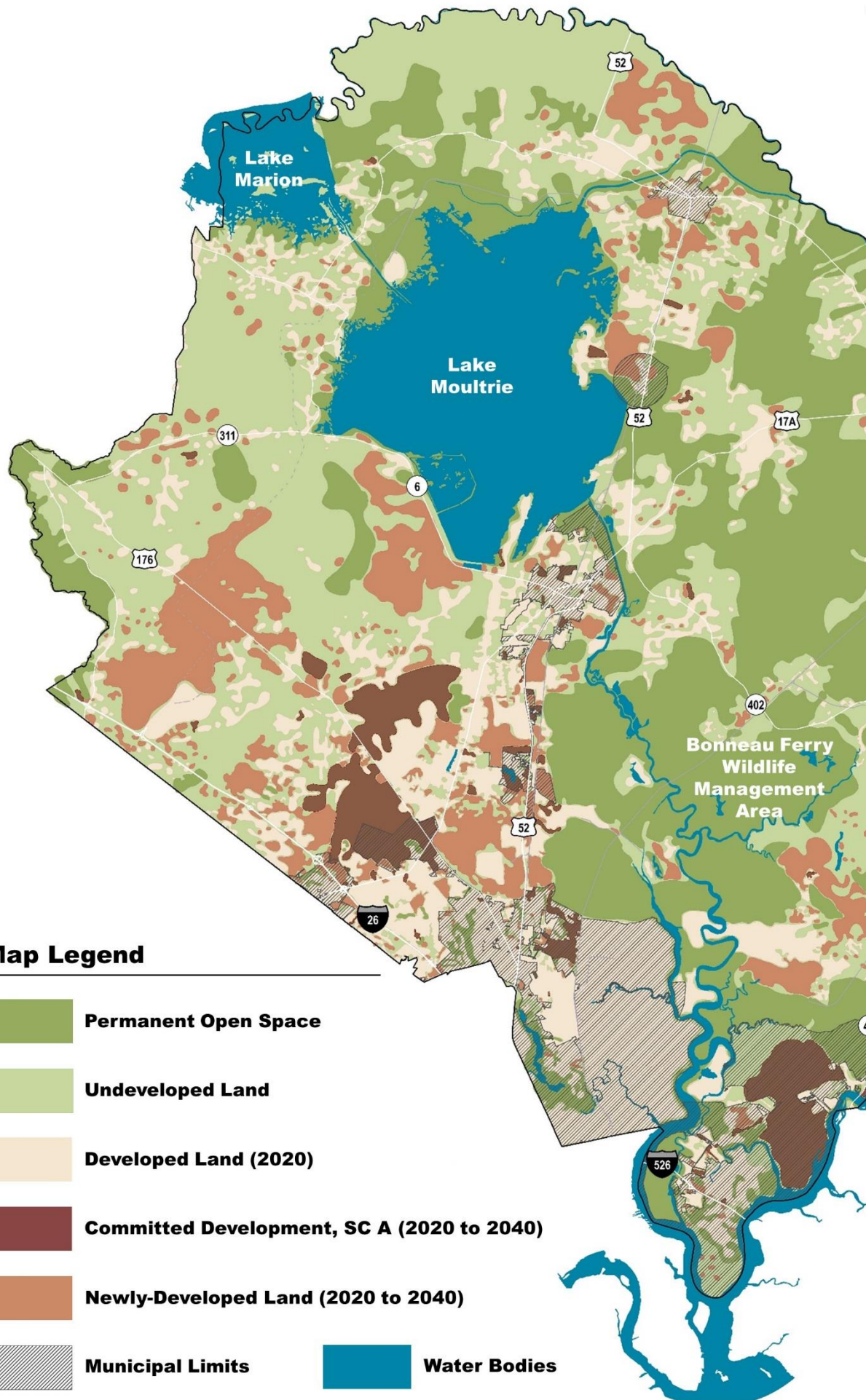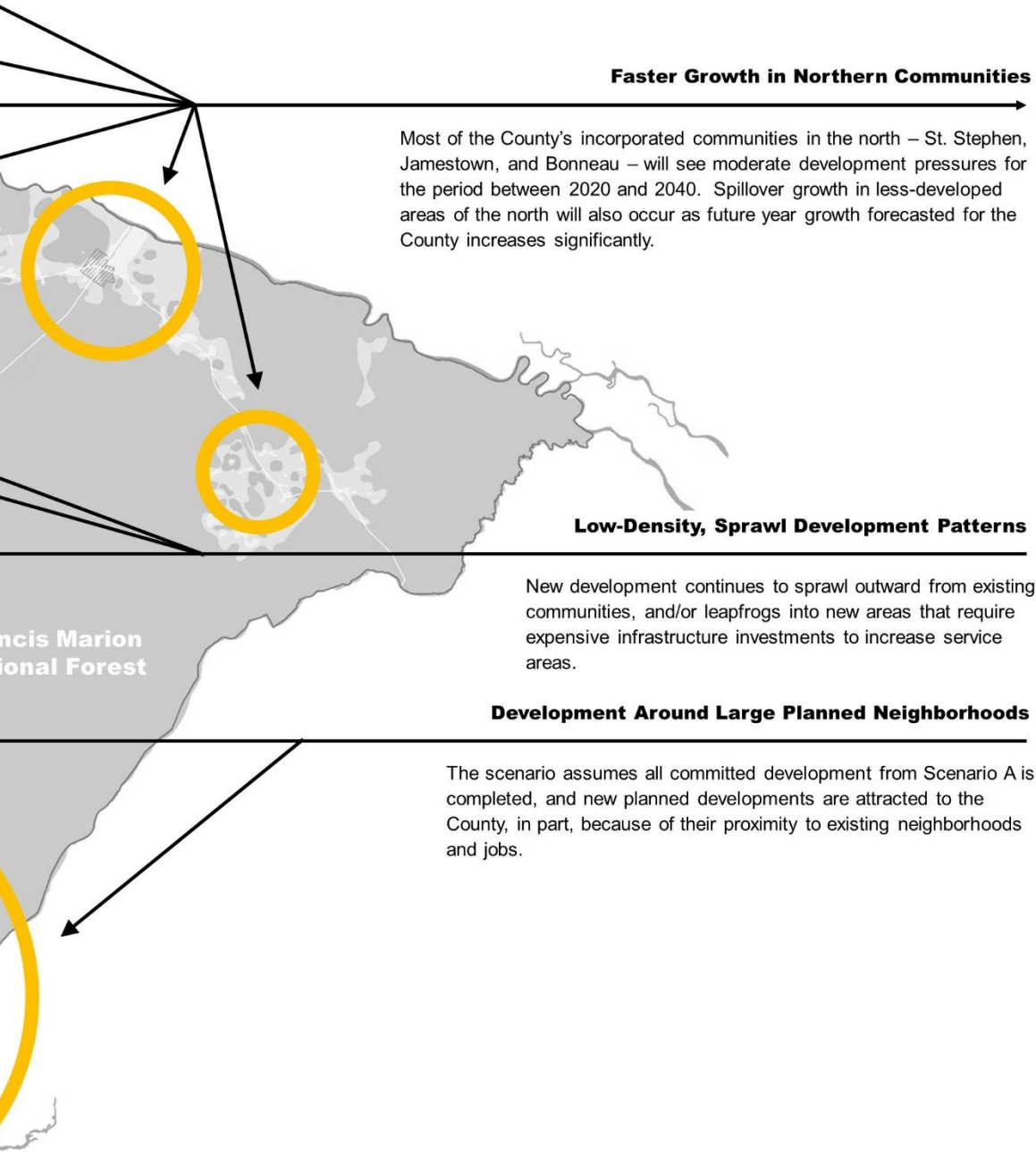**Western Berkeley County Growth Pressure**

Areas east of Camp Hall will develop in the future as infrastructure is extended in the area – in particular the Palmetto Railroad. Areas along US Highway 176 and Volvo Card Drive continue to transform into a residential and industrial enclave within the County.

# Scenario C: Accelerated Trend Development

## Intended Growth Areas

### Faster Growth in Northern Communities

Most of the County's incorporated communities in the north – St. Stephen, Jamestown, and Bonneau – will see moderate development pressures for the period between 2020 and 2040. Spillover growth in less-developed areas of the north will also occur as future year growth forecasted for the County increases significantly.

### Low-Density, Sprawl Development Patterns

New development continues to sprawl outward from existing communities, and/or leapfrogs into new areas that require expensive infrastructure investments to increase service areas.

### Development Around Large Planned Neighborhoods

The scenario assumes all committed development from Scenario A is completed, and new planned developments are attracted to the County, in part, because of their proximity to existing neighborhoods and jobs.

ncis Marion
ional Forest

**Map Legend**

- Permanent Open Space
- Undeveloped Land
- Developed Land (2020)
- Committed Development, SC A (2020 to 2040)
- Newly-Developed Land (2020 to 2040)
- Municipal Limits
- Water Bodies

Lake Marion

Lake Moultrie

Bonneau Ferry Wildlife Management Area

# Scenario D: Managed Growth

The Managed Growth Scenario considers how the County might **grow differently and consistent with public feedback received thus far during the planning process for the One Berkeley County Comprehensive Plan.** Infrastructure investments would maximize the efficiency of existing systems, helping control the cost to government for providing future public facilities and services. A greater concentration of development along and between "priority growth" or "premium transit" corridors on the map — locations marked A and B on the Intended Growth Areas Map — could also increase the amount of land preserved as open space or rural landscapes. More compact, mixed-use development patterns reduce residents' need for a car to satisfy some their daily travel needs. Opportunities to live, work, shop, and be entertained in new mixed-use, walkable activity centers could draw people to (sub)urbanizing areas.

The scenario envisions the population growing to 468,000 people (compared to 468,000 in Scenario C and 399,000 people in Scenario B). As with all scenarios, it includes the committed development inventory from Scenario A. The additional development includes just under 50,000 dwelling units and almost 60 million square feet of non-residential space.

**Francis Marion National Forest**

41
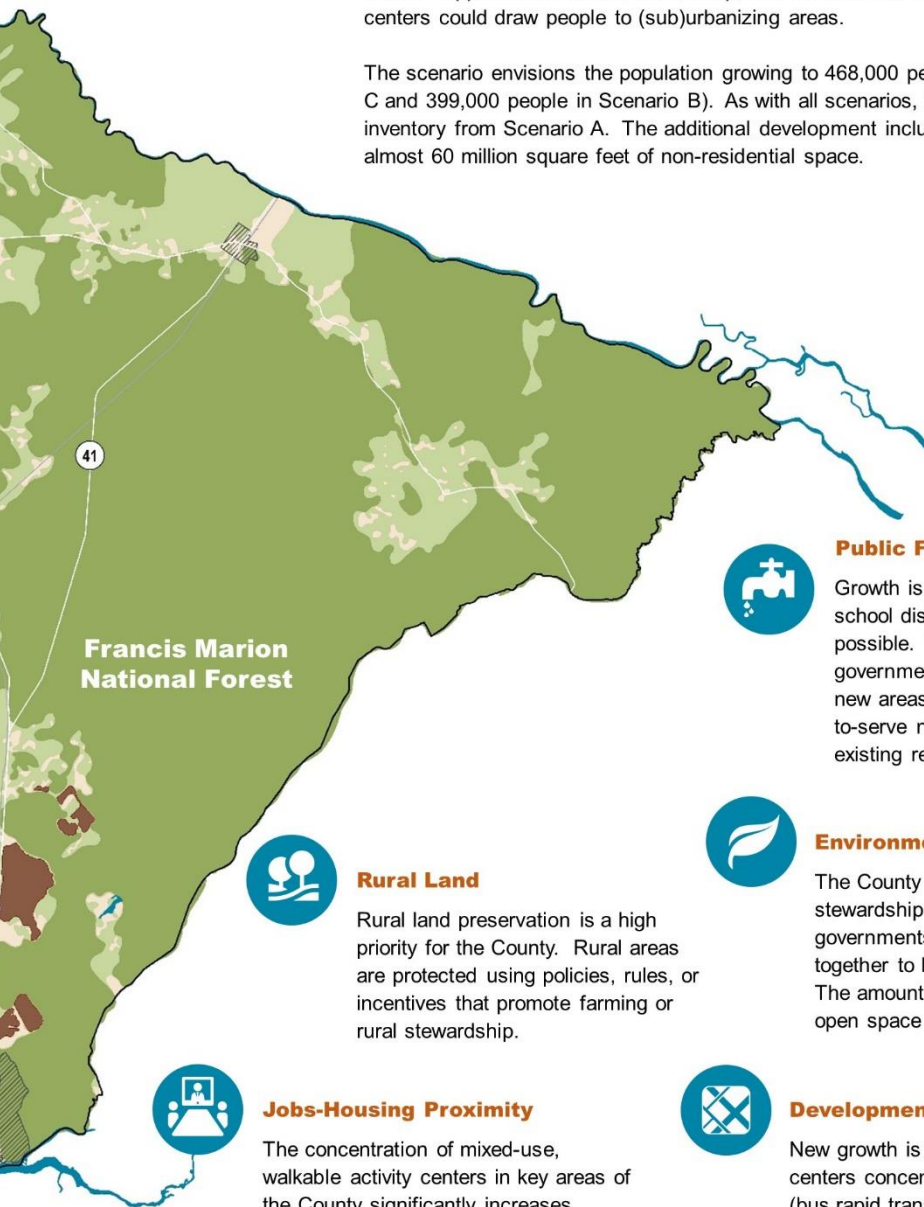
## Public Facilities & Services

Growth is focused into existing water, sewer, and school district service areas to the maximum extent possible. This helps reduce or eliminate additional government investments to extend infrastructure into new areas to support future development. The cost-to-serve new development is reduced by using existing resources.

## Environmental Stewardship

The County shows a renewed interest in environmental stewardship across different communities. Local governments and private land conservation groups work together to highlight the need to preserve natural areas. The amount of land in the region held as permanent open space (parks, greenways, etc.) increases.

## Rural Land

Rural land preservation is a high priority for the County. Rural areas are protected using policies, rules, or incentives that promote farming or rural stewardship.

## Development Footprint

New growth is focused into compact, walkable activity centers concentrated along premium transportation corridors (bus rapid transit). Nearby opportunities to live, work, shop, and be entertained draw people to (sub)urbanizing areas. Land outside planned activity centers and surrounding transition areas is primarily preserved for open space, farmland, or rural living.

## Jobs-Housing Proximity

The concentration of mixed-use, walkable activity centers in key areas of the County significantly increases opportunities to link jobs and housing in close proximity.

## Housing Mix

New neighborhood design and housing choices favor a shift to greater variety of housing options in the community (and often times in the same neighborhood). Average residential densities in designated growth areas range between 4 to 20 homes per acre; emphasizing small-lot, single-family detached housing, townhomes, condominiums, and apartments.

## Viable Travel Options

Cars are the primary mode of transportation for residents in the County. However, investments in premium transit (bus rapid transit) are increased in more targeted areas to meet daily commuting needs. Regional bus service connects riders with premium transit corridors. Mixed-use, walkable development in planned activity centers shorten trip lengths and increase the number of viable travel mode options.

Lake
Marion

Lake
Moultrie

52

17A

311

176

6

52

402

Bonneau Ferry
Wildlife
Management
Area

A

B

A

A

B

A

A

A

B

B

B

A

A

26

52

41

526

**Interstate 26 Development**

Industrial and commercial development
continues along the Interstate 26 corridor
until land is no longer available.

**Western Berkeley County Growth Pressure**

Areas east of Camp Hall will develop in the future as infrastructure is
extended in the area – in particular the Palmetto Railroad. Areas
along US Highway 176 and Volvo Card Drive continue to transform
into a residential and industrial enclave within the County.

# Scenario D: Managed Growth
## Intended Growth Areas
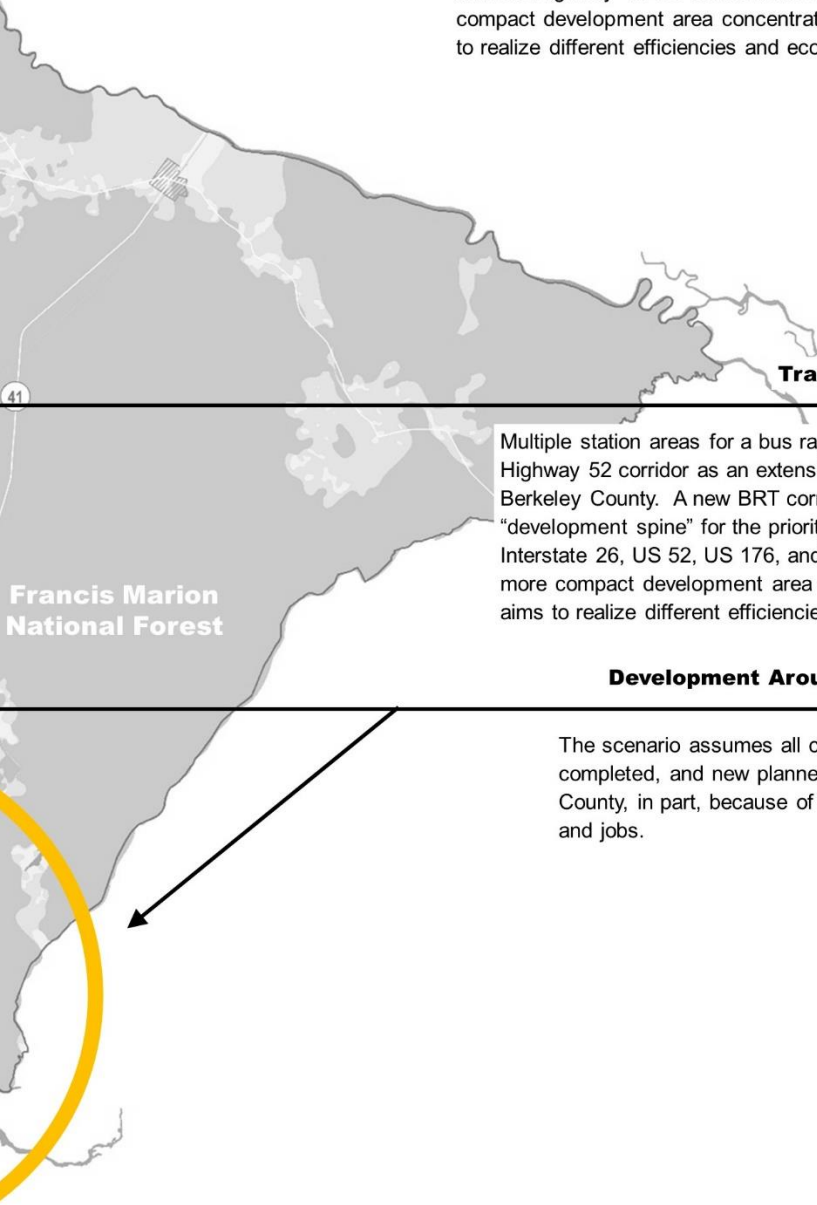
### Mixed-Use Development Activity Centers (B)

Multiple mixed-use, walkable activity centers are planned along Interstate 26 and US Highway 17A to concentrate new development in the County. A more compact development area concentrates infrastructure investments and aims to realize different efficiencies and economies-of-scale.
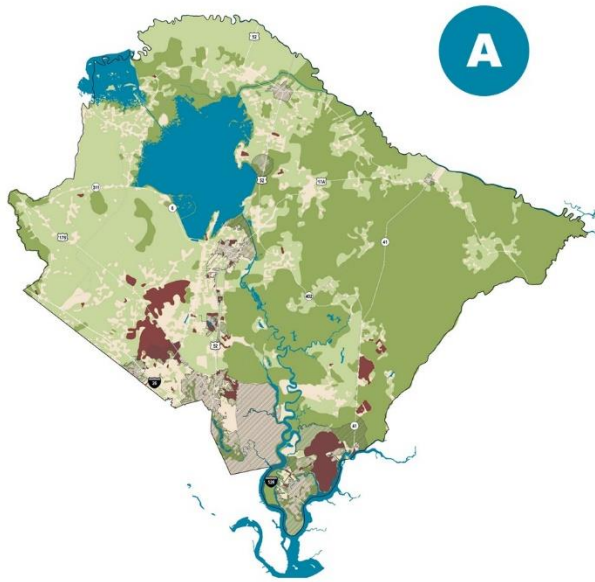
### Transit-Oriented Development Nodes (A)

Multiple station areas for a bus rapid transit (BRT) are planned along the US Highway 52 corridor as an extension of the region's planned service south of Berkeley County. A new BRT corridor along the US Highway 176 creates a "development spine" for the priority growth area generally bounded by Interstate 26, US 52, US 176, and the Berkeley-Orangeburg County Line. A more compact development area concentrates infrastructure investments and aims to realize different efficiencies and economies-of-scale.

### Development Around Large Planned Neighborhoods

The scenario assumes all committed development from Scenario A is completed, and new planned developments are attracted to the County, in part, because of their proximity to existing neighborhoods and jobs.
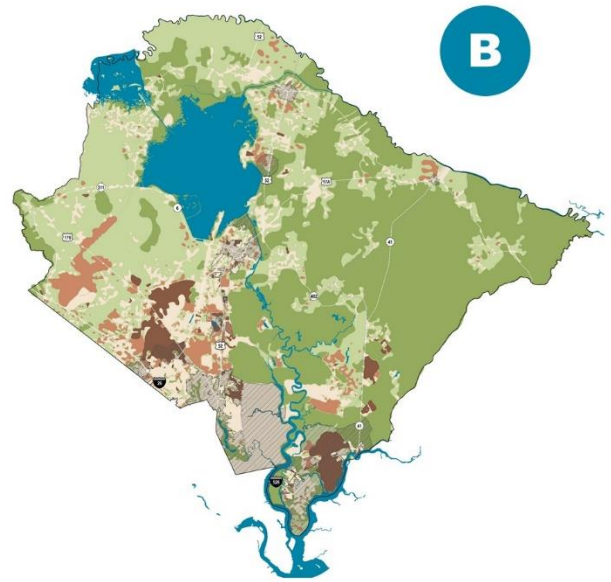
Francis Marion
National Forest

41

# Side-by-Side Scenario Comparison

A

B

## Committed Development

## Trend Development

**What if all the development that has currently been approved is actually built?  What are the impacts from this development?**

**What if we keep developing in the ways that we've grown in the recent past?**

**What are the impacts from this development?**

| | Committed |
|---|---|
| Population (2020) | 229,861 |
| Employment (2019) | 60,274 |
| Total Housing Units (2020) | 84,461 |
| Population (2040) | 351,000 |
| Employment (2040) | 65,000 |
| Total Housing Units (2040) | 134,000 |
| New Development Footprint Context (2040) | |
| Rural Living | 11% |
| Suburban Neighborhoods | 83% |
| Suburban Centers | 4% |
| Industrial Centers | 1% |
| Mixed-Use Centers | 1% |
| New Home Construction Choices (2040) | |
| Single-Family Detached | 79% |
| Townhome, Duplex or Triplex | 7% |
| Apartment or Condominium | 14% |
| Commitment to Open Space | No Change |
| Increase in Development Footprint (2040) | +8,505 acres |
| Access to Amenities (2040) | |
| Homes within ½-Mile of Existing Parks | 64% |
| Homes within ¼-Mile of Existing Transit Service | 36% |
| Increased Infrastructure Needs (2040) | |
| New Road Centerline Miles | 527 |
| New Water Line Miles | 556 |
| New Sewer Line Miles | 562 |
| Financial Return-on-Investment Index | 1.23 |
| (County Revenue / Expenditures, Annual Estimate) | |

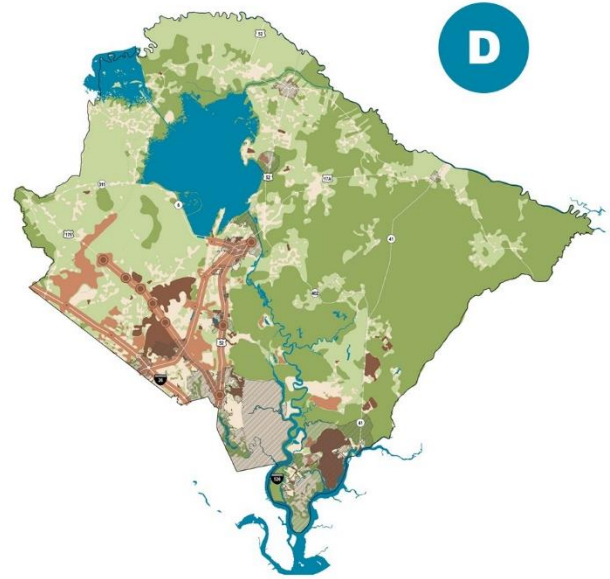| | Trend |
|---|---|
| Population (2020) | 229,861 |
| Employment (2019) | 60,274 |
| Total Housing Units (2020) | 84,461 |
| Population (2040) | 399,000 |
| Employment (2040) | 134,500 |
| Total Housing Units (2040) | 154,000 |
| New Development Footprint Context (2040) | |
| Rural Living | 8% |
| Suburban Neighborhoods | 43% |
| Suburban Centers | 16% |
| Industrial Centers | 32% |
| Mixed-Use Centers | 1% |
| New Home Construction Choices (2040) | |
| Single-Family Detached | 83% |
| Townhome, Duplex or Triplex | 6% |
| Apartment or Condominium | 11% |
| Commitment to Open Space | No Change |
| Increase in Development Footprint (2040) | +11,730 acres |
| Access to Amenities (2040) | |
| Homes within ½-Mile of Existing Parks | 46% |
| Homes within ¼-Mile of Existing Transit Service | 27% |
| Increased Infrastructure Needs (2040) | |
| New Road Centerline Miles | 911 |
| New Water Line Miles | 960 |
| New Sewer Line Miles | 897 |
| Financial Return-on-Investment Index | 1.34 |
| (County Revenue / Expenditures, Annual Estimate) | |
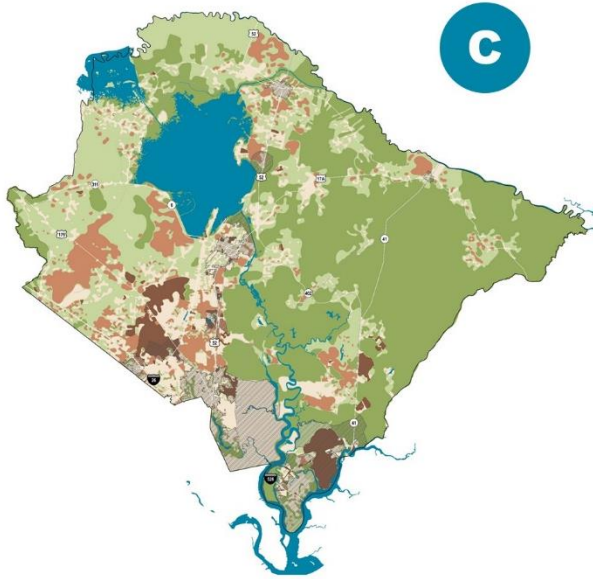
# Accelerated Trend Development

**What if the County grows to a level near the maximum values in the forecasted range?**

**What are the impacts from this level of increased development?**

| | |
|---|---|
| Population (2020) | 229,861 |
| Employment (2019) | 60,274 |
| Total Housing Units (2020) | 84,461 |
| | |
| Population (2040) | 468,000 |
| Employment (2040) | 134,500 |
| Total Housing Units (2040) | 181,500 |
| New Development Footprint Context (2040) | |
|    *Rural Living* | *14%* |
|    *Suburban Neighborhoods* | *44%* |
|    *Suburban Centers* | *14%* |
|    *Industrial Centers* | *27%* |
|    *Mixed-Use Centers* | *1%* |
| New Home Construction Choices (2040) | |
|    *Single-Family Detached* | *83%* |
|    *Townhome, Duplex or Triplex* | *6%* |
|    *Apartment or Condominium* | *11%* |
| Commitment to Open Space | No Change |
| Increase in Development Footprint (2040) | +16,537 acres |
| Access to Amenities (2040) | |
|    *Homes within ½-Mile of Existing Parks* | *52%* |
|    *Homes within ¼-Mile of Existing Transit Service* | *30%* |
| Increased Infrastructure Needs (2040) | |
|    *New Road Centerline Miles* | *1,243* |
|    *New Water Line Miles* | *1,292* |
|    *New Sewer Line Miles* | *998* |
| Financial Return-on-Investment Index | 1.22 |
| (County Revenue / Expenditures, Annual Estimate) | |

# Managed Growth

**What happens by 2040 if the County implements land development regulations consistent with public feedback?**

| | |
|---|---|
| Population (2020) | 229,861 |
| Employment (2019) | 60,274 |
| Total Housing Units (2020) | 84,461 |
| | |
| Population (2040) | 468,000 |
| Employment (2040) | 134,500 |
| Total Housing Units (2040) | 181,500 |
| New Development Footprint Context (2040) | |
|    *Rural Living* | *5%* |
|    *Suburban Neighborhoods* | *52%* |
|    *Suburban Centers* | *5%* |
|    *Industrial Centers* | *34%* |
|    *Mixed-Use Centers* | *4%* |
| New Home Construction Choices (2040) | |
|    *Single-Family Detached* | *60%* |
|    *Townhome, Duplex or Triplex* | *20%* |
|    *Apartment or Condominium* | *20%* |
| Commitment to Open Space | Big Increase |
| Increase in Development Footprint (2040) | +11,706 acres |
| Access to Amenities (2040) | |
|    *Homes within ½-Mile of Existing Parks* | *57%* |
|    *Homes within ¼-Mile of Existing Transit Service* | *37%* |
| Increased Infrastructure Needs (2040) | |
|    *New Road Centerline Miles* | *981* |
|    *New Water Line Miles* | *1,076* |
|    *New Sewer Line Miles* | *1,098* |
| Financial Return-on-Investment Index | 1.30 |
| (County Revenue / Expenditures, Annual Estimate) | |
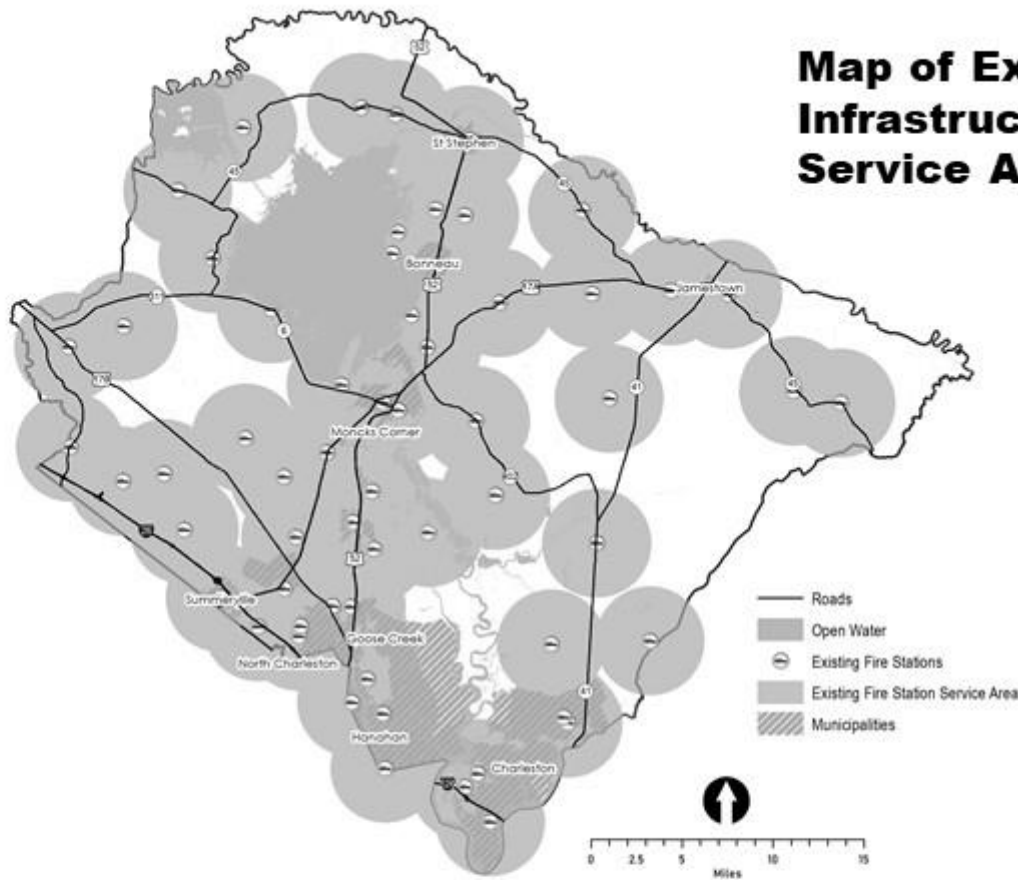
## New Residential Growth by Area by Scenario

| Fire Department | Committed | Trend | Accelerated Trend | Managed Growth |
|---|---|---|---|---|
| Pineville | 0 | 553 | 1,723 | 0 |
| St. Stephen | 124 | 2,065 | 5,115 | 2,988 |
| Alvin | 0 | 3 | 36 | 0 |
| Macedonia | 0 | 153 | 356 | 0 |
| Jamestown Rural | 0 | 549 | 1,065 | 0 |
| Santee Circle | 0 | 72 | 223 | 3 |
| Cainhoy | 1,953 | 3,960 | 5,304 | 2,040 |
| Moncks Corner Rural | 108 | 1,310 | 2,099 | 3,552 |
| Pimlico | 780 | 1,749 | 1,885 | 1,441 |
| Goose Creek Rural | 412 | 843 | 1,026 | 813 |
| Moncks Corner City | 1,611 | 2,245 | 3,008 | 2,671 |
| Whitesville | 12,530 | 14,736 | 15,787 | 21,546 |
| Goo | | | | |
| C&B | | | | |
| Pine | | | | |
| Leba | | | | |
| Cros | | | | |
| Eadytown | 26 | 26 | 31 | 26 |
| Cordesville | 39 | 183 | 292 | 45 |
| Sandridge/Pringletown | 3 | 225 | 525 | 1,775 |
| Charleston | 14,935 | 16,003 | 16,416 | 16,088 |
| Longridge | 117 | 537 | 715 | 2,204 |
| Hanahan (Otranto) | 268 | 1,052 | 853 | 1,039 |
| Caromi | 52 | 279 | 436 | 407 |
| Summerville | 175 | 414 | 280 | 407 |
| N Charleston | 0 | 0 | 0 | 0 |

This portion of the page reports the amount of new residential growth anticipated under each of the four growth scenarios using different sub-geographies that are important to the specific infrastructure category presented.

# Likely Impacts to Infrastructure: An Overview

This section of the report provides more detailed information on the impacts measured for the four growth scenarios on seven different infrastructure categories: public education, fire protection, police protection, emergency medical services, parks and recreation, water and sewer, and roads and stormwater. It is important to be aware that the information presented here are estimates based on best available information at the time of this analysis, and an assessment of existing conditions and current service delivery standards in the planning area. New or changing conditions either inside the county — a new growth or fiscal policy — and outside the county — external forces that change the cost of building materials — could impact the estimates provided in this report.

All of the infrastructure categories chosen for this analysis are sensitive to the type, location, pattern, and intensity of development. Some calculations are performed in a spreadsheet, and others are preformed in a GIS spatial environment using the Berkeley County CommunityViz Model. Four of the infrastructure categories — roads and stormwater, water and sewer, parks, and fire protection — account for where existing infrastructure is located in the planning area today, and may lower the need for expansion or new facilities in the future because existing facilities with available capacity exist nearby. Other infrastructure categories — police protection, public education, and emergency medical services services — are not driven by service area geographies, and their impacts are calculated by multiplying new demand by current service delivery standards specific to each infrastructure category. Methods for estimating costs are briefly presented in this section and described in detail in the methodology and analysis tools section of the report.

For those looking for more detailed information on the measured impacts to infrastructure, or reporting of impacts by city or town in the planning area, this information is available in the technical appendix of the report. The callout boxes in blue on pages 47 and 48 explain how to read the tables that follow for the seven infrastructure categories.

## New Resources by Scenario

This portion of the page presents estimates for the amount of new personnel, equipment, or structures that would be required to serve new development in the four scenarios. The numbers reported focus only on new demand levels, and do not reflect existing conditions in the reporting. This table typically focuses on a single county entity (schools) or a group of similar entities (rural fire departments) depending on the infrastructure category.

## Estimated Future Expenses by Scenario

This portion of the page presents high-level cost estimates by growth scenario. Capital costs generally reflect an estimate of NEW infrastructure needed to serve new development in the final year of the twenty-year planning horizon. Replacement costs generally reflect an estimate to replace or rehabilitate EXISTING infrastructure that ages over time and must be fixed or replaced by the final year of the twenty-year planning horizon. Annual operating and maintenance costs are estimated as annualized expenses for operating and maintaining a particular service or infrastructure component year-to-year during the planning horizon.

# Existing Fire Departments
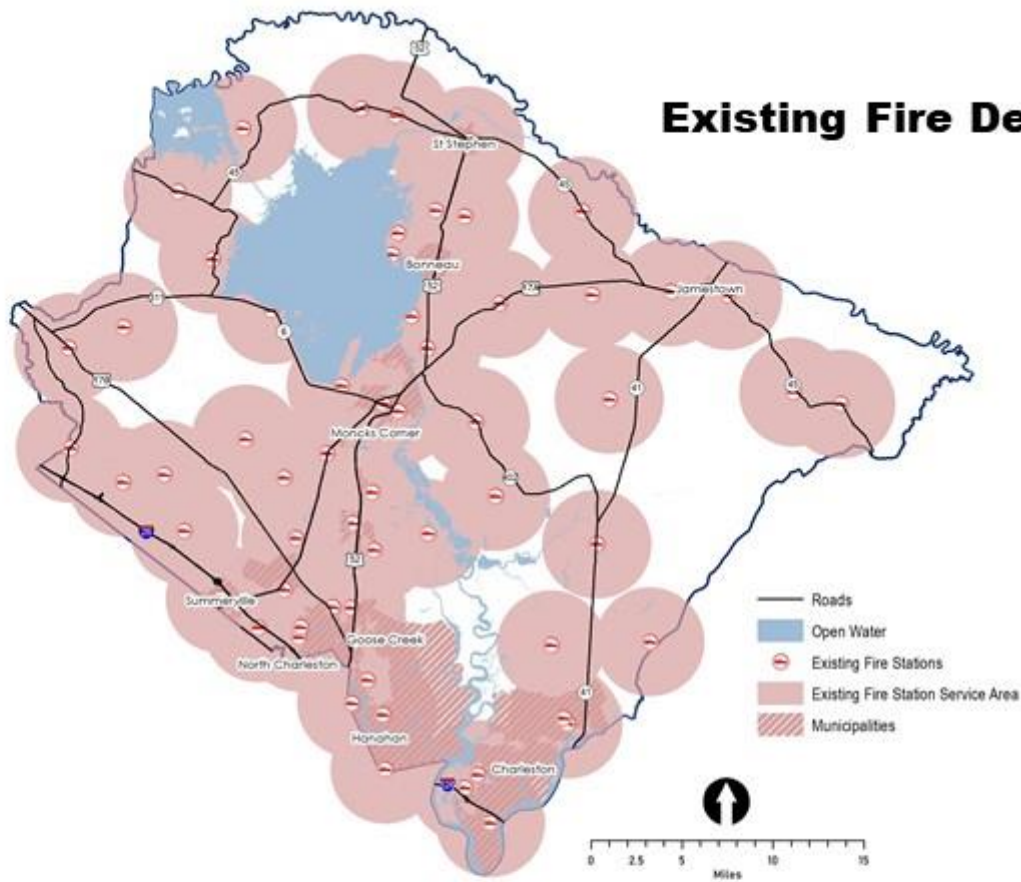
## New Residential Growth by Rural Fire Dept. by Scenario

| Fire Department | Committed | Trend | Accelerated Trend | Managed Growth |
|---|---|---|---|---|
| Pineville | 0 | 553 | 1,723 | 0 |
| St. Stephen | 124 | 2,065 | 5,115 | 2,988 |
| Alvin | 0 | 3 | 36 | 0 |
| Macedonia | 0 | 153 | 356 | 0 |
| Jamestown Rural | 0 | 549 | 1,065 | 0 |
| Santee Circle | 0 | 72 | 223 | 3 |
| Cainhoy | 1,953 | 3,960 | 5,304 | 2,040 |
| Moncks Corner Rural | 108 | 1,310 | 2,099 | 3,552 |
| Pimlico | 780 | 1,749 | 1,885 | 1,441 |
| Goose Creek Rural | 412 | 843 | 1,026 | 813 |
| Moncks Corner City | 1,611 | 2,245 | 3,008 | 2,671 |
| Whitesville | 12,530 | 14,736 | 15,787 | 21,546 |
| Goose Creek City | 5,169 | 5,922 | 6,606 | 7,313 |
| C&B | 332 | 527 | 635 | 772 |
| Pine Ridge | 10,740 | 13,119 | 14,314 | 17,749 |
| Lebanon | 6 | 2,155 | 8,596 | 12,879 |
| Cross | 8 | 323 | 7,978 | 9 |
| Eadytown | 26 | 26 | 31 | 26 |
| Cordesville | 39 | 183 | 292 | 45 |
| Sandridge/Pringletown | 3 | 225 | 525 | 1,775 |
| Charleston | 14,935 | 16,003 | 16,416 | 16,088 |
| Longridge | 117 | 537 | 715 | 2,204 |
| Hanahan (Otranto) | 268 | 1,052 | 853 | 1,039 |
| Caromi | 52 | 279 | 436 | 407 |
| Summerville | 175 | 414 | 280 | 407 |
| N Charleston | 0 | 0 | 0 | 0 |

# Likely Impacts Assessment: Rural and Municipal Fire Departments

The six municipal and twenty rural fire departments in the planning area will be impacted differently by the four growth scenarios. Scenario A creates a demand for two new fire stations. Scenario B creates a demand for four new fire stations. Scenario C creates a demand for eight new fire stations, and Scenario D creates a demand for six new fire stations.

Rural fire departments will be more impacted by any of the scenarios because of limited funding and their volunteer firefighter systems. The Fire Districts of Whitesville (which recently opened a new fire station), Pine Ridge, Lebanon, and Cross will absorb most of the impacts from new development in nearly all the scenarios.

Recent changes at the County for how rural fire departments are funded will help the situation, but some rural departments may need to rely on professional fire fighters to keep up with increased demands in terms of the number of calls and their times of day. The six municipal fire departments will also be impacted, but none more than the stations serving the Cainhoy Peninsula.

## New Rural Fire Resources by Scenario

| New Resources | Committed | Trend | Accelerated Trend | Managed Growth |
|---|---|---|---|---|
| Fire Stations | 2 | 4 | 8 | 6 |
| Department Apparatus | 11 | 14 | 24 | 17 |
| Fire Department Personnel | 91 | 143 | 227 | 227 |

## Estimated Future Rural Fire Expenses by Scenario

| | Committed | Trend | Accelerated Trend | Managed Growth |
|---|---|---|---|---|
| Capital Costs | $5,435,000 | $8,153,000 | $14,948,000 | $10,872,000 |
| Replacement Cost | $76,671,000 | $76,671,000 | $76,671,000 | $76,671,000 |
| Annual Operations and Maintenance | $10,769,000 | $12,795,000 | $15,937,000 | $15,774,000 |

## Existing Police Departments
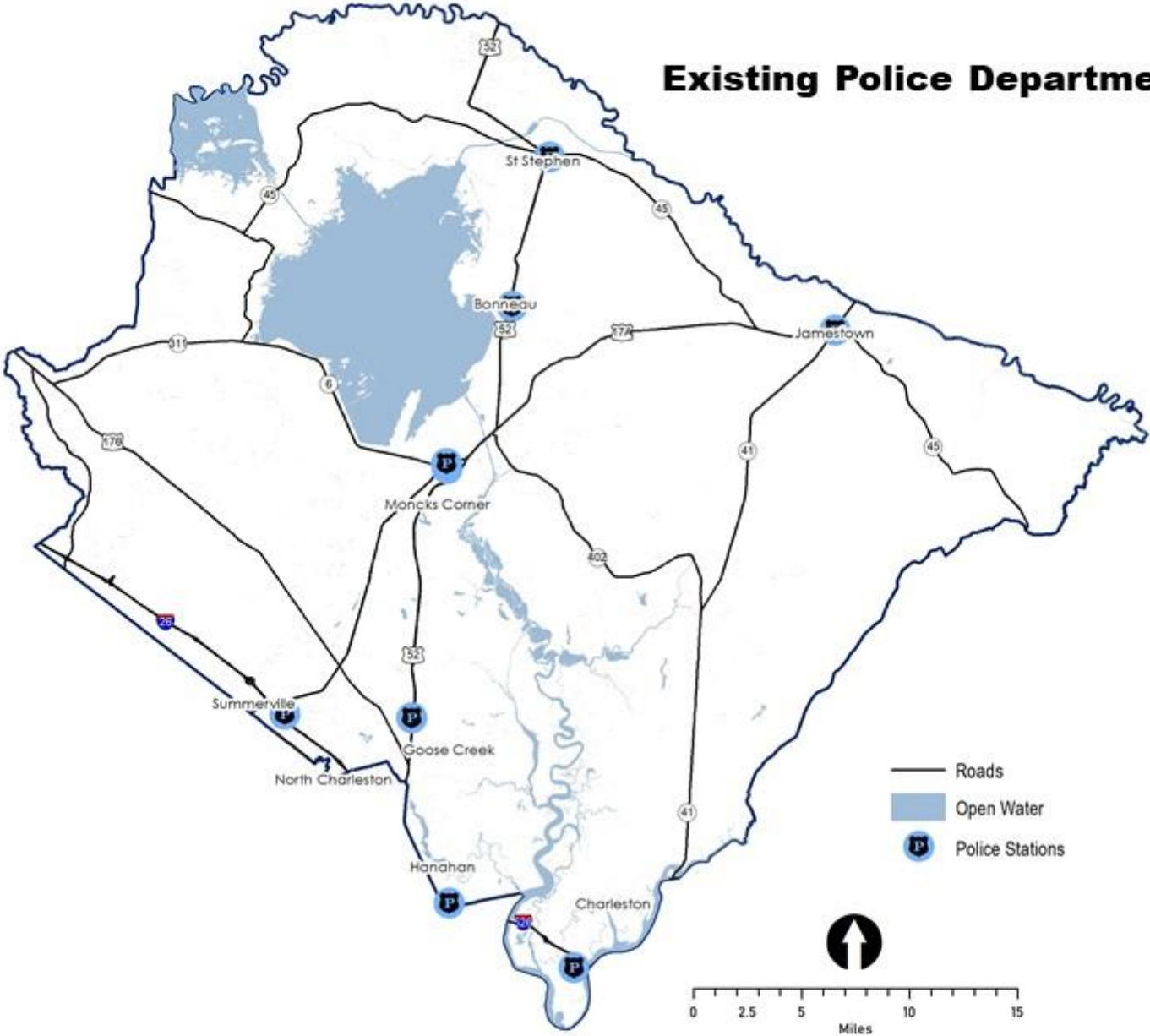
## New Residential Growth by Jurisdiction

| Community | Committed | Trend | Accelerated Trend | Managed Growth |
|---|---|---|---|---|
| Unincorporated Berkeley County | 26,356 | 41,410 | 66,373 | 65,763 |
| St. Stephen | 0 | 477 | 1,686 | 2,776 |
| Bonneau | 0 | 260 | 510 | 0 |
| Jamestown | 0 | 73 | 161 | 0 |
| Monck's Corner | 1,802 | 2,664 | 3,526 | 3,112 |
| Goose Creek | 5,117 | 5,550 | 5,874 | 6,635 |
| Summerville | 175 | 503 | 417 | 665 |
| North Charleston | 0 | | 0 | 0 |
| Hannahan | 320 | 1,104 | 905 | 1,091 |
| Charleston | 15,876 | 17,259 | 17,648 | 17,058 |

# Likely Impacts Assessment : Law Enforcement

The ten law enforcement agencies in the planning area will be impacted by new growth and development. However, the Berkeley County Sheriff Department will be most impacted because a significant amount of growth in all four scenarios is anticipated outside of existing municipal limits (assuming no municipal annexations during the planning horizon). Scenario A contemplates up to 128 new sworn officers to meet future demand. Scenario B contemplates up to 201 new sworn officers to meet future demand. Scenarios C and D contemplate up to 315 new sworn officers to meet future demand. (Note: the demand for new sworn officers is based on population growth versus the form of development. This explains why the demand for new officers in Scenarios C and D are the same.)

## New Resources by Scenario - BCSO

|  | Committed | Trend | Accelerated Trend | Managed Growth |
|---|---|---|---|---|
| Patrol Vehicles | 69 | 108 | 169 | 168 |
| Command and Unmarked Support Vehicles | 44 | 69 | 108 | 108 |
| Specialty Vehicles | 9 | 13 | 21 | 21 |
| Equipment and Special Operations | 1 | 1 | 1 | 1 |
| Police Department Personnel | 128 | 201 | 315 | 315 |

## Estimated Future Expenses by Scenario - BCSO

|  | Committed | Trend | Accelerated Trend | Managed Growth |
|---|---|---|---|---|
| Capital Costs | $11,556,000 | $18,140,000 | $28,427,000 | $28,368,000 |
| Replacement Cost | $46,315,000 | $46,315,000 | $46,315,000 | $46,315,000 |
| Annual Operations and Maintenance | $25,012,000 | $30,040,000 | $37,897,000 | $37,852,000 |

## Existing EMS Substations
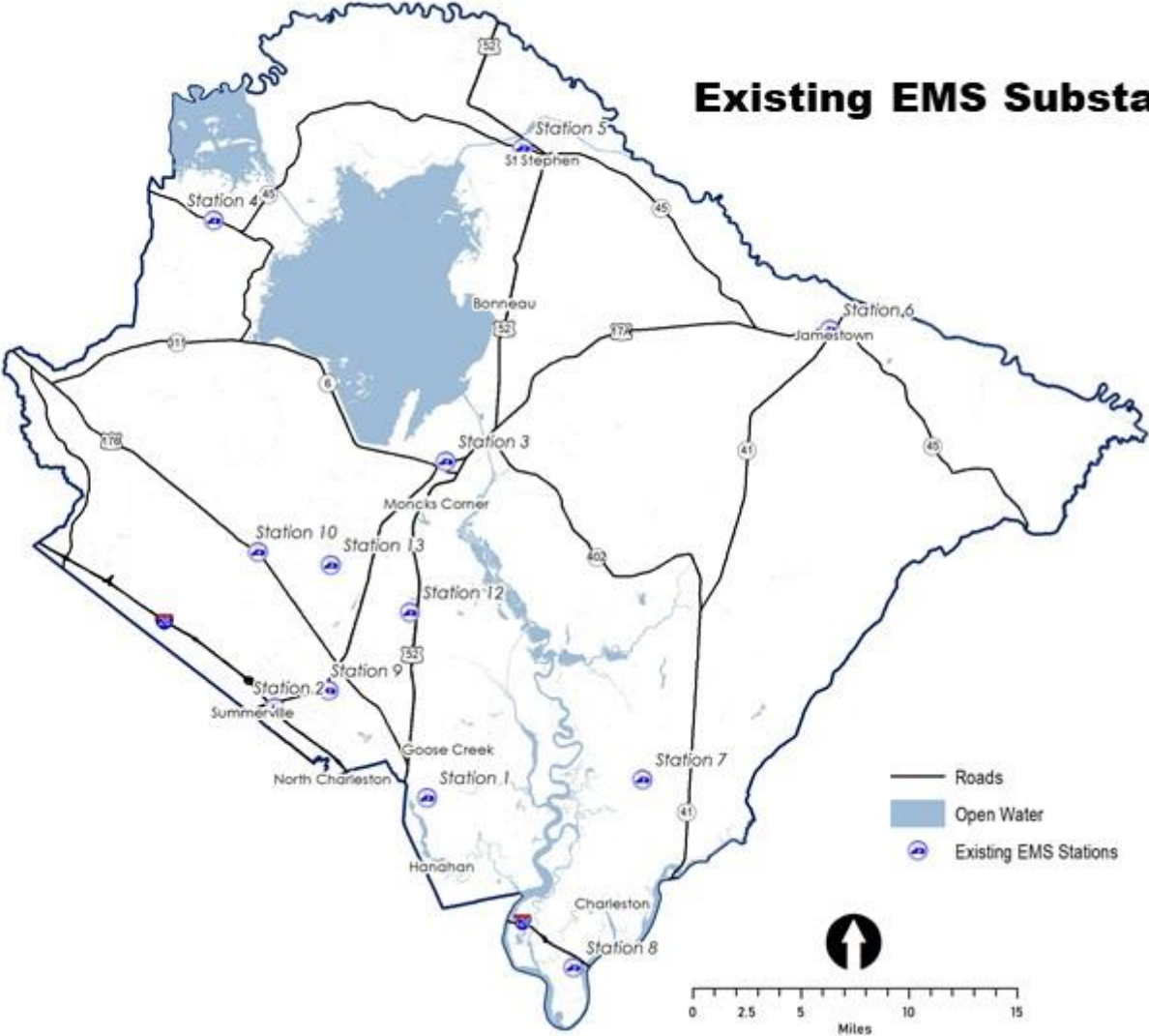
## New Residential Growth by EMS District by Scenario

| EMS Station* | Committed | Trend | Accelerated Trend | Managed Growth |
|---|---|---|---|---|
| 1 | 1,846 | 2,938 | 3,015 | 3,410 |
| 2 | 7,790 | 8,373 | 8,803 | 9,837 |
| 3 | 899 | 2,145 | 5,795 | 7,390 |
| 4 | 38 | 314 | 5,817 | 38 |
| 5 | 124 | 2,531 | 6,585 | 2,988 |
| 6 | 325 | 1,069 | 2,010 | 325 |
| 7 | 8,006 | 10,654 | 11,935 | 8,353 |
| 8 | 8,659 | 9,083 | 9,551 | 9,552 |
| 9 | 3,517 | 6,529 | 7,929 | 9,492 |
| 10 | 8,871 | 13,534 | 20,807 | 32,253 |
| 12 | 2,269 | 4,789 | 5,927 | 5,010 |
| 13 | 7,303 | 7,303 | 7,387 | 7,387 |

*Station 11 - is not listed, as it serves only as a Medic parking place.

# Likely Impacts Assessment : Emergency Medical Services

Demands for increased emergency medical services in the four scenarios also increases based on new residents expected for the planning area. 48 EMS personnel are anticipated to serve Scenario A. 67 new EMS personnel are anticipated to serve Scenario B. 92 new EMS personnel are anticipated to serve Scenarios C and D. Changes to the EMS operations model in the future will reduce the need to build or maintain fixed EMS stations; however, new resources will be needed to accommodate roving service areas that general follow demand (service calls).
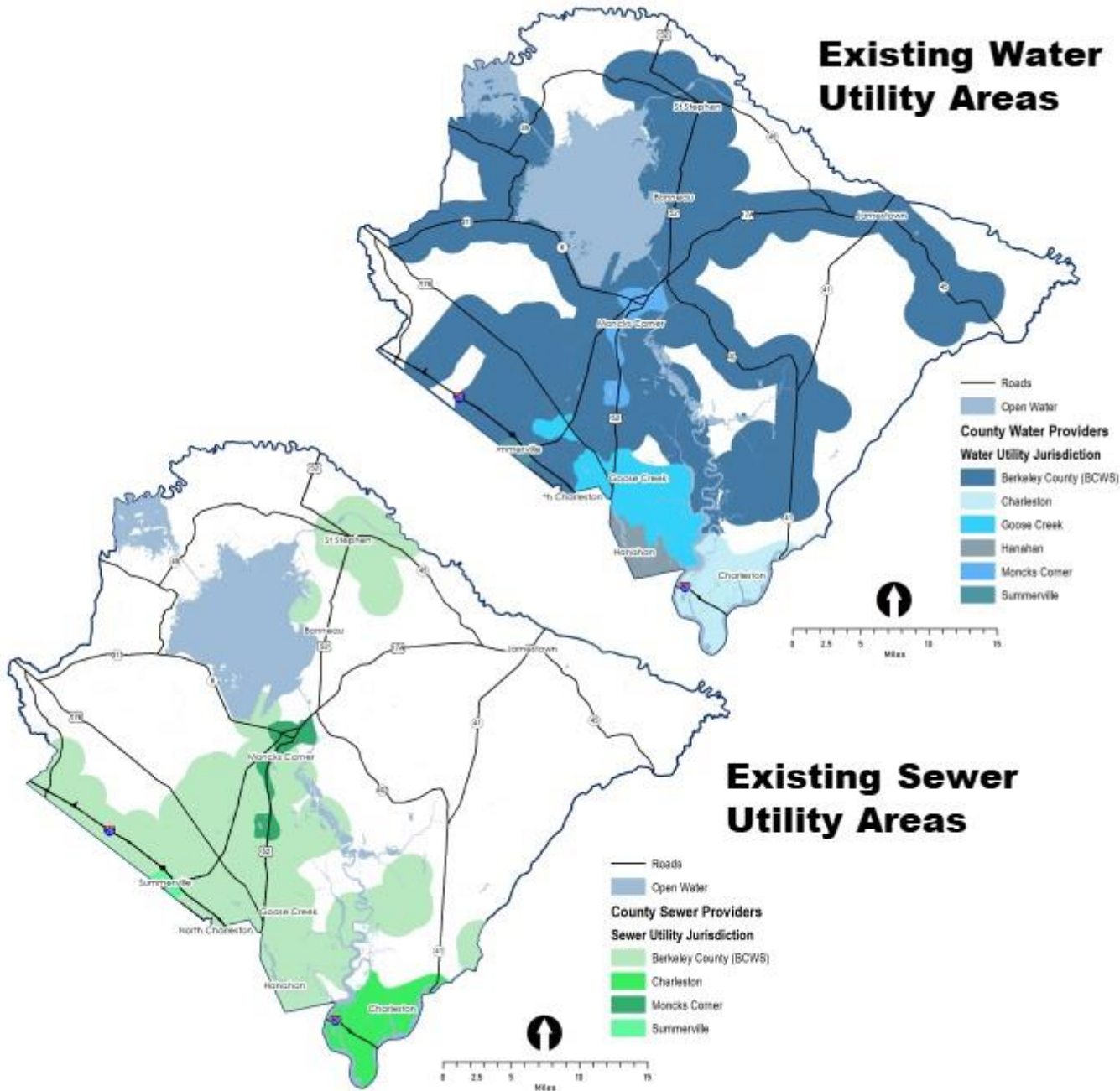
## New BCEMS Resources by Scenario - BCEMS

|  | Committed | Trend | Accelerated Trend | Managed Growth |
|---|---|---|---|---|
| EMS Substations | 0 | 0 | 0 | 0 |
| EMS Vehicles | 8 | 12 | 19 | 19 |
| EMS Personnel | 48 | 67 | 92 | 92 |

## Estimated Future Expenses by Scenario - BCEMS

|  | Committed | Trend | Accelerated Trend | Managed Growth |
|---|---|---|---|---|
| Capital Costs | $1,917,000 | $2,875,000 | $4,552,000 | $4,552,000 |
| Replacement Cost | $25,042,000 | $25,042,000 | $25,042,000 | $25,042,000 |
| Annual Operations and Maintenance | $13,326,000 | $15,145,000 | $17,583,000 | $17,627,000 |

**Existing Water Utility Areas**

Roads
Open Water
**County Water Providers**
**Water Utility Jurisdiction**
Berkeley County (BCWS)
Charleston
Goose Creek
Hanahan
Moncks Corner
Summerville

**Existing Sewer Utility Areas**

Roads
Open Water
**County Sewer Providers**
**Sewer Utility Jurisdiction**
Berkeley County (BCWS)
Charleston
Moncks Corner
Summerville

## New Water and Wastewater Resources by Scenario

| Entire County | Committed | Trend | Accelerated Trend | Managed Growth |
|---|---|---|---|---|
| Water Demand (million gallons per day) | 11.6 | 16.4 | 22.8 | 20.8 |
| Sewer Demand (million gallons per day) | 8.1 | 11.3 | 15.7 | 13.3 |
| Water Distribution (Miles of Pipe) | 556 | 960 | 1292 | 1076 |
| Sewer Distribution System (Miles of Pipe) | 562 | 897 | 998 | 1098 |
| | | | | |
| **Berkeley County Water and Sanitation** | | | | |
| Water Distribution (Miles of Pipe) | 343 | 684 | 1,008 | 816 |
| Sewer Distribution System (Miles of Pipe) | 391 | 680 | 775 | 768 |
| Pump Stations | 78 | 145 | 190 | 169 |
| Sewer Treatment Plant (expanded capacity) | 172% | 122% | 102% | 87% |
| Vehicles & Major Equipment | 64 | 120 | 156 | 139 |
| Administration | 50% | 50% | 50% | 50% |
| Personnel | 126 | 234 | 306 | 272 |

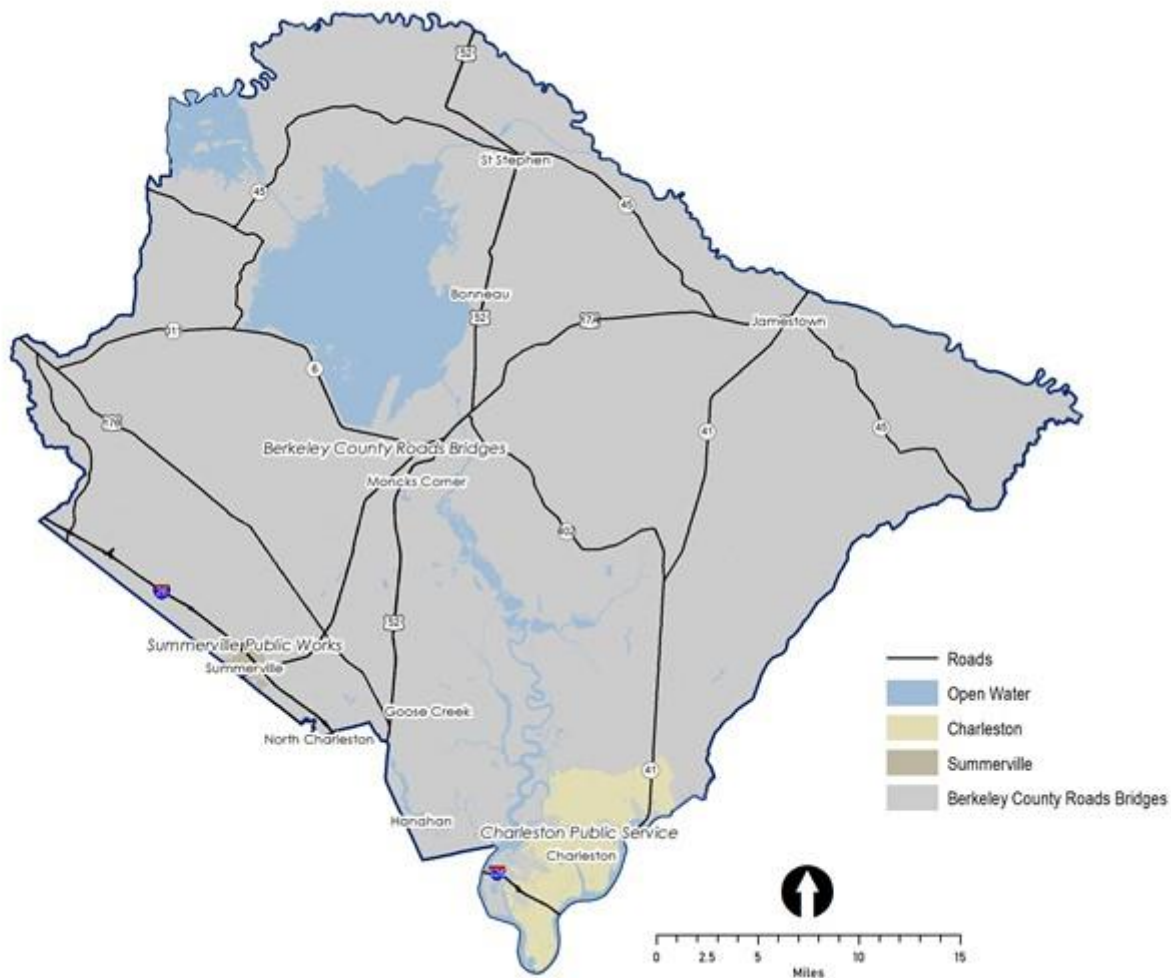# Likely Impacts Assessment : Water and Sewer Service

The County's water and sewer system will need to expand substantially to meet different demands associated with the four growth scenarios. For Scenario A, 343 miles of new water lines and 391 miles of new sewer lines would be needed to meet the location and intensity of future development anticipated for the County's service district. Demand numbers increase in the three remaining scenarios: Scenario B increases to 684 miles of new water lines and 680 miles of new sewer lines, Scenario C increase to 1,008 miles of new water lines and 775 miles of new sewer lines, and Scenario D increases to 816 miles of new water lines and 768 miles of new sewer lines, Of note, the capital costs to build new water and sewer lines in Scenario D is greater than Scenario C because some low-density development in Scenario C is assumed to use private wells and septic systems. All development in Scenario D is assumed to be on the County's water and sewer system.

Other key features for an expanded water and sewer system to serve new development are summarized for the four scenarios in the infrastructure packs section of the report.

## Estimated Future Expenses by Scenario – BC Water and Sanitation

|  | Committed | Trend | Accelerated Trend | Managed Growth |
|---|---|---|---|---|
| Capital Costs | $40,476,000 | $58,655,000 | $71,010,000 | $80,838,000 |
| Replacement Cost | $991,621,000 | $991,621,000 | $991,621,000 | $991,621,000 |
| Annual Operations and Maintenance | $55,551,000 | $63,814,000 | $69,322,000 | $66,721,000 |

Roads
Open Water
Charleston
Summerville
Berkeley County Roads Bridges

0   2.5   5   10   15
Miles

## New Future Road and Stormwater Resources by Scenario

| Entire County | Committed | Trend | Accelerated Trend | Managed Growth |
|---|---|---|---|---|
| New Roads (mi) | 527 | 911 | 1,343 | 981 |
| **Berkeley County Roads and Bridges** | | | | |
| New Roads (mi) | 351 | 675 | 977 | 749 |
| Additional Dept. Vehicles | 134 | 259 | 375 | 287 |
| Additional Dept. Personnel | 30 | 70 | 100 | 80 |
| Additional Stormwater Main (mi) | 50 | 110 | 160 | 120 |
| Additional Stormwater Channel (mi) | 50 | 100 | 140 | 110 |
| Additional Stormwater Ponds | 60 | 110 | 170 | 130 |
| Additional Stormwater Dept. Personnel | 30 | 60 | 90 | 70 |

# Likely Impacts Assessment : Roads and Stormwater

The County currently maintains 330 miles of roads — approximately 18% of all roads in the planning area. The remaining roads are maintained by the Federal Highway Administration, State of South Carolina, or private associations. For Scenario A, the County would maintain 66% of all new roads needed to serve new development (351 of 527 new road miles). For Scenario B, the number jumps to 74% of all new roads to serve an expanded development footprint (675 of 911 new road miles). For Scenario C, the number falls to 72% of all new roads to account for the expanded development footprint (977 of 1,343 new road miles). For Scenario D, the number jumps to 76% of all new roads (749 of 981 new road miles). Many of the new roads are assumed to be built by the developer, and transferred to the County for operation, maintenance, and replacement in the future after a period of warranty. Of note, the cost to upgrade rural intersections to meet the demands of suburban-level traffic in the future will also be expensive, and Scenarios B and C will be the most-costly because of they extend liberally into existing rural areas.

The County's storm sewer system will also grow to serve new development in the four scenarios: Scenario A requires 50 new stormwater main miles, Scenario B requires 110 new stormwater main miles, Scenario C requires 160 new stormwater main miles, and Scenario D requires 120 stormwater main miles.

## Estimated Future Expenses by Scenario - Depart. of Roads and Bridges

|  | Committed | Trend | Accelerated Trend | Managed Growth |
|---|---|---|---|---|
| Capital Costs | $0 | $0 | $0 | $0 |
| Replacement Cost | $102,523,000 | $102,523,000 | $102,523,000 | $102,523,000 |
| Annual Operations and Maintenance | $14,466,000 | $18,365,000 | $21,456,000 | $19,319,000 |
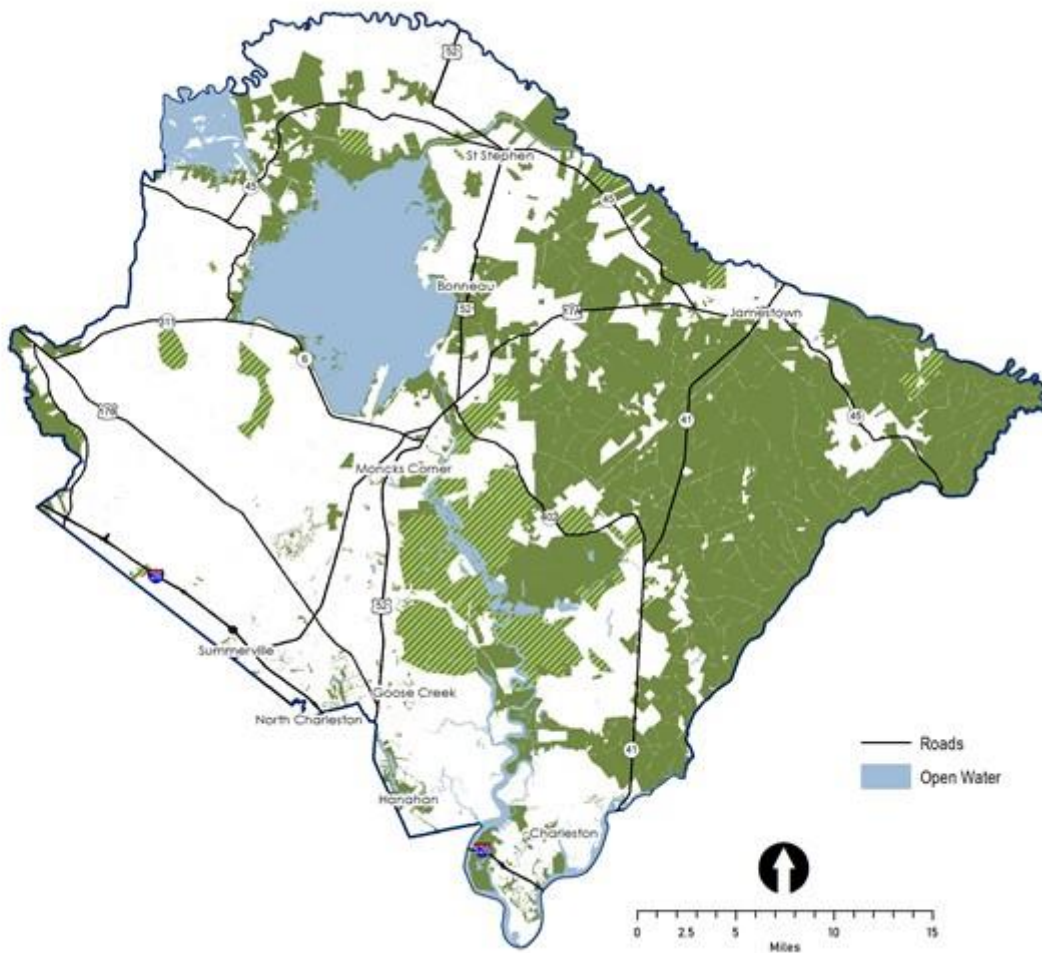
## New Future Resources, Acres of Recreation Park by Provider

| Parks District | Committed | Trend | Accelerated Trend | Managed Growth |
|---|---|---|---|---|
| Unincorporated County Entities* | 40 | 108 | 351 | 349 |
| City of Charleston | 50 | 51 | 97 | 95 |
| City of Goose Creek | 9 | 11 | 36 | 41 |
| City of Hanahan | 0 | 0 | 4 | 6 |
| Devon Forest Special Tax District | 0 | 0 | 0 | 0 |
| Goose Creek Parks and Playgrounds | 0 | 0 | 10 | 7 |
| Nexton Regional Improvement Association | 85 | 85 | 120 | 120 |
| Pimlico Special Tax District | 0 | 0 | 1 | 2 |
| Sangaree Special Tax District | 0 | 0 | 0 | 0 |
| St. Stephen | 0 | 4 | 21 | 34 |
| Tall Pines Special Tax District | 0 | 0 | 0 | 0 |
| Town of Bonneau | 0 | 0 | 6 | 0 |
| Town of Jamestown | 0 | 0 | 1 | 0 |
| Town of Moncks Corner | 3 | 5 | 18 | 16 |
| Town of Summerville | 0 | 0 | 1 | 2 |
| Total | 188 | 264 | 667 | 672 |

*New and existing HOAs, improvement districts and other neighborhood associations

# Likely Impacts Assessment : Parks & Recreation

Apart from Cypress Gardens and seven boat landings, the County itself maintains very few parks or recreation facilities in the planning area. Residents do benefit from close proximity to the Francis Marion National Forest, but it offers a limited type and number of recreation activities.

Neighborhood- and community-serving parks in the planning area are not evenly distributed in the planning area, and there exists a complex arrangement between city, town, special district, and homeowner association groups to maintain facilities in different park locations.

Assuming existing service delivery standards, the planning area will need several hundred acres of new parks to serve the different growth scenarios. Many of the new parks will be installed as amenities for master planned communities. But these facilities will likely not be open to the public unless specifically required to in a development approval. County residents may need to rely on school facilities, private clubs or associations, or parks in municipalities to meet demand unless a new vision and implementing policies are included in the new Comprehensive Plan to start a process for instilling a county-led parks and recreation initiative.

## Estimated Future Expenses by Scenario - Municipalities & Park Districts

|  | Committed | Trend | Accelerated Trend | Managed Growth |
|---|---|---|---|---|
| Capital Costs | $0 | $0 | $0 | $0 |
| Replacement Cost | $3,532,000 | $3,532,000 | $3,532,000 | $3,532,000 |
| Annual Operations and Maintenance | $22,820,000 | $25,288,000 | $37,971,000 | $38,164,000 |
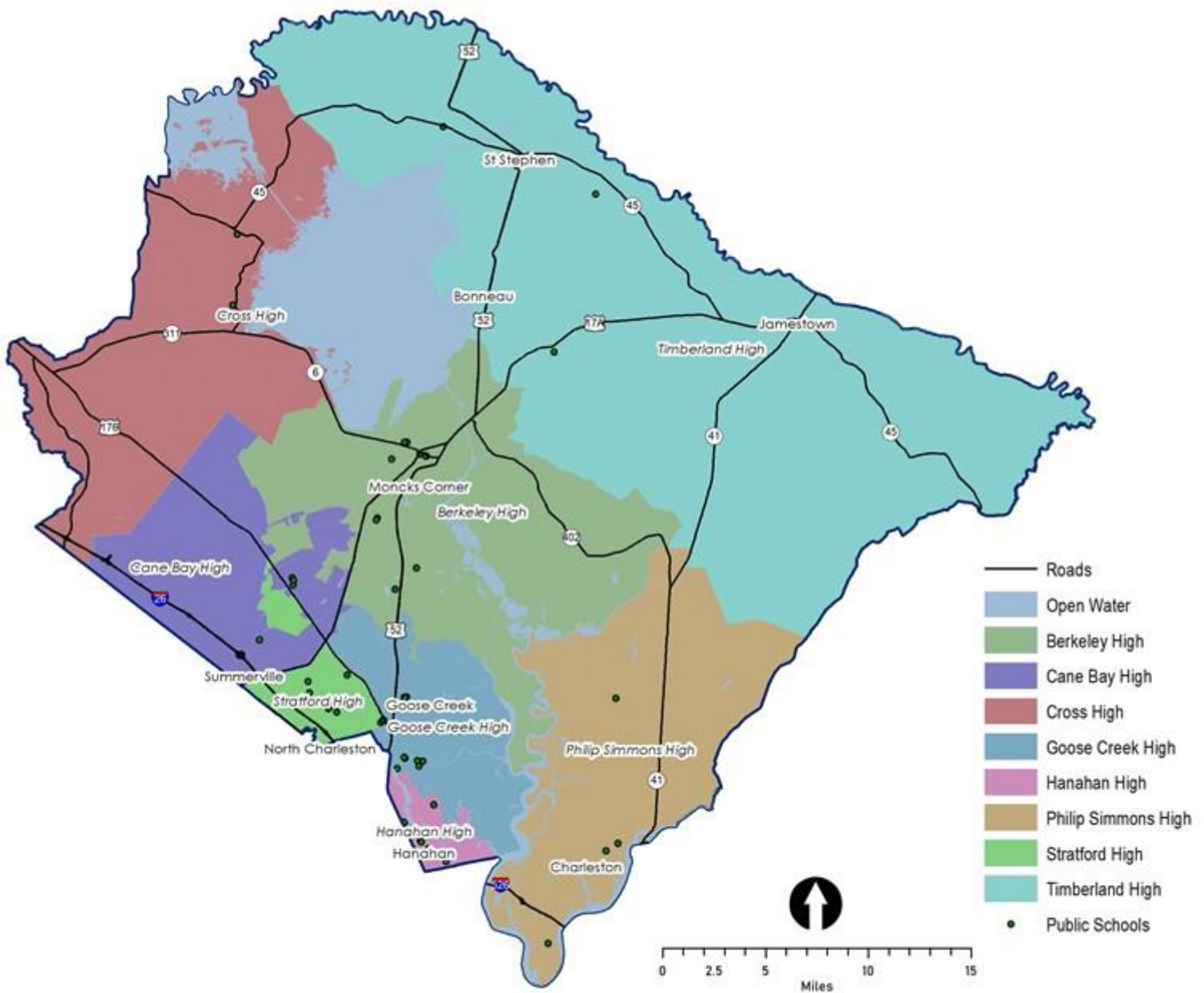
## New Future Resources, Estimated Enrollment Increase by High School

| High School | Committed | Trend | Accelerated Trend | Managed Growth |
|---|---|---|---|---|
| Cane Bay High School | 122% | 142% | 186% | 311% |
| Philip Simmons High School | 174% | 210% | 223% | 186% |
| Berkeley High School | 48% | 91% | 120% | 134% |
| Goose Creek High | 12% | 19% | 20% | 21% |
| Cross High | 1% | 11% | 328% | 96% |
| Hanahan High | 3% | 13% | 11% | 13% |
| Stratford High | 55% | 68% | 70% | 73% |
| Timberland High | 6% | 51% | 124% | 47% |

# Likely Impacts Assessment : Public Schools

The Berkeley County School District serves the entire planning area, and demands are expected to increase for all four growth scenarios: Scenario A increases demand by 18,872 students, Scenario B increases demand by 26,328 students, and Scenarios C and D increase new demand by 36,506 students. Some new students could be accommodated in existing schools, or classroom and facility expansions at existing schools. The expanded development footprint associated with Scenarios B and C could significantly impact the number of schools needed in the planning area. Busing and other student transportation costs could also increase in Scenarios B and C as new development extends far into rural areas.

## Estimated Future Expenses by Scenario

|  | Committed | Trend | Accelerated Trend | Managed Growth |
|---|---|---|---|---|
| Capital Costs | $251,390,000 | $360,690,000 | $502,780,000 | $502,780,000 |
| Replacement Cost | $2,054,840,000 | $2,054,840,000 | $2,054,840,000 | $2,054,840,000 |
| Annual Operations and Maintenance | $428,710,000 | $493,899,000 | $581,241,000 | $582,702,000 |

# General Findings & Conclusions

Comparison of the four alternative growth scenarios for Berkeley County confirms that different land use patterns and development intensities envisioned for the planning area could have significant impacts on community cohesiveness, character, financial stability, and the efficient use of infrastructure for decades to come.  Information from the Summary Report should be shared with stakeholders in the planning process to create the new Comprehensive Plan.  And specifically, it should provide background information and support for efforts to develop the official Future Land Use Map that will be included in the new document.

The paragraphs that follow provide a narrative summary of the alternative growth scenarios, and highlight the trade-offs with each for making more informed decisions about a best path forward for the new Comprehensive Plan. The information presented in the Summary Report is almost entirely data-driven, and the findings and conclusions presented in the report respond to the data presented.  It is important to put this information in the context of the overall planning process for the new Comprehensive Plan, and to weigh the report's findings and recommendations against the community vision, guiding principles, and comments collected to this point for the new Comprehensive Plan.

## Tools to Manage the Location, Intensity & Timing of Growth

Berkely County has experienced a tremendous amount of growth over the last twenty years, and several comments heard from the community leading up to the scenario planning and likely impacts analysis focused on "slowing down future residential development to keep pace with available infrastructure capacity". The alternative scenarios tested different levels of residential growth for the twenty-year planning horizon, which would be influenced largely by policies in the new Comprehensive Plan to either encourage, or discourage, new development in the future.

Scenario A (Committed Development) assumed the least amount of growth for the planning area — generally stopping new development approvals in the future and letting only committed development (approved, but not yet built) build out. Strong policies that limit, or outright stop, growth in the future are needed in the new Comprehensive Plan to implement this vision.

Scenario B (Trend Development) assumes some new development approvals by the County during the twenty-year planning horizon, but they would occur less frequently, or at least be smaller in size, than past political or market trends would otherwise indicate. Again, moderate to strong policies in the new Comprehensive would be needed to implement this vision to slow growth in the future.

Scenarios C (Accelerated Trend Development) and D (Managed Growth) both assume development approvals in the future consistent with the number and size of projects over the last twenty years. Policies to manage the location, intensity, or location of growth in the future are less important in the new Comprehensive Plan if this vision is preferred by the community.

One note, several participants at the Growth Choices Workshop asked why a Scenario E was not evaluated, which would combine the depressed residential development anticipated in Scenario B with the conservation and development principles considered for Scenario D. The simple answer was available resources. Policies should be considered in the new Comprehensive Plan to manage the location, intensity, and timing of growth in the future if the premise behind a hypothetical Scenario E (depressed growth) is appealing to the community.

## Tax Base Balance

The ratio of residential to non-residential tax base in a community is usually very important to local leaders. Generally speaking, non-residential uses require less services than residential uses — especially when considering the financial impacts of public education — and often times non-residential uses pay higher taxes than residential uses. This phenomenon is especially true in South Carolina with the current tax rules and programs, which set higher assessment values and tax rates for residential rental, commercial, and industrial uses compared to residential (homestead or homeowner) uses. And, homeowners are granted an additional tax credit on school operating taxes compared to other uses. (Note: these statements do not take into account the impact of tax incentives or tax breaks that may be granted as part of an economic development package created to bring a business to the county.)

Scenario A assumes zero new employees for the twenty-year planning horizon based on the type and intensity of committed

development observed in the planning area (i.e., nearly all residential). In this scenario, all new tax revenue to the County is generated from new residential development.

Scenarios B, C, and D all assume the same level of employment growth for the planning area, which is consistent with projections for the CHATS Regional Travel Demand Model and current trends and indicators observed by the County's Economic Development Department. Employees for new jobs may live in Berkeley County, or they may live outside the County and commute into the area each day for work.

Support toward balancing the tax base in Scenarios B, C, and D will require policies and recommendations in the new Comprehensive Plan to support, and potentially accelerate, non-residential development for the twenty-year planning horizon.

## Existing or Expanded Service Areas

The type, location, pattern, and intensity of new development in each scenario will impact existing infrastructure service areas differently, and either require them to expand in size to support new development areas, or increase in capacity for existing service areas to keep pace with new demands. Generally speaking, the cost to upsize infrastructure in existing services areas is less compared to extending infrastructure into new services areas because of the cost and time needed to acquire new land or easements to extend services.

Future year development for Scenario A is concentrated in a few key areas: the Cainhoy Peninsula and a large, triangle area between Goose Creek, Summerville, and Moncks Corner. This includes several master planned communities like Cane Bay, Wildcat, Nexton, Carnes Crossroads, and Cainhoy Plantation. It

is assumed infrastructure exists, or is planned in the future, to serve these previously-approved developments. For this reason, existing service areas for new infrastructure are assumed to remain largely the same for the future, and improvements will be targeted to upsize existing facilities to meet new demands.

Scenarios B and C require expansion of existing infrastructure service areas to keep pace with new demand. Extending infrastructure to these areas will require certain planning, permitting, funding, and construction activities needed to build service extensions. Policies, maps, and recommendations in the new Comprehensive Plan should coordinate these efforts to implement one of the two visions to extend development away from existing centers.

Scenario D contemplates a different future for the planning area, which reflects growth and development inward toward existing infrastructure service areas to the maximum extent possible. Policies, maps, and recommendations in the new Comprehensive Plan should coordinate these efforts if this vision is preferred in the community.

## Preferred Development Principles

Generally speaking, Scenarios A, B, and C continue "business-as-usual" practices in the planning area for preferred growth and development principles. Single-use, low-density development patterns and intensities spread throughout the County, which are exemplified by suburban neighborhoods, highway strip commercial, and large industrial buildings. Increased growth pressures further away from existing centers extend into rural areas, and further degrade rural character preservation efforts. The new Comprehensive Plan should advocate for more suburban-scale

development patterns in the future if one of these visions is preferred in the community.

Scenario D contemplates a future where new growth is focused into compact, walkable activity centers concentrated along premium transit corridors (bus rapid transit). Nearby opportunities to live, work, shop, and be entertained draw people to (sub)urbanizing areas. Land outside planned activity centers or corridors is primarily preserved for open space, farmland, or rural living. The new Comprehensive Plan should rethink the previous Future Land Use Map for Berkeley County and its supporting policies and recommendations for land use, housing, transportation, and environmental stewardship if this vision is preferred in the community.

## Viable Travel Options

Automobiles continue to be the primary mode of transportation for residents in Scenarios A, B, and C. Investments in Interstate 26 and various US and SC Highways will be needed to keep pace with new development. Lessons learned from more urbanizing counties in the United States prove it is expensive to implement policies that simply try to expand existing infrastructure to keep up with demand, and often times the lag between planning, permitting, funding, and construction new infrastructure (sometimes twenty years) is unable to keep up with annual, compounding increases in demand.

Scenario D still assumes automobiles will be the primary mode of transportation for residents in the county. However, it also invests in premium transit (bus rapid transit) for targeted areas to meet some demands, especially daily commuting to job centers in Dorchester or Charleston Counties. Regional bus service would connect residents with the

premium transit corridors. More compact development patterns in Scenario D also have the potential to shorten trip lengths, and increase the likelihood some residents might be able to walk or bike between destinations.

The new Comprehensive Plan will need to advocate for either an automobile-only, or automobile plus, transportation system. The vision for transportation in the Comprehensive Plan will be influenced, in part, by the Future Land Use Map (FLUM), which depicts preferred development types, locations, patterns, and intensities for the community. The development framework presented in the FLUM has the potential to directly influence trip generation, trip length, and mode choice for residents.

## Home Choices

Home choices in Scenarios A, B, and C are generally limited to single-family detached homes on large lots. New neighborhoods in the planning area would average less than three dwelling units per gross acre.

Home choices increase in Scenario D to accommodate a more compact development footprint. Average residential densities may range between four and twenty dwelling units per gross acre, and include a variety of single-family homes, townhomes, apartments, or condominiums in very targeted areas of the county. Some communities in Scenario D may also include live-work units.

The new Comprehensive Plan will need to advocate for a home choice policy and implementing recommendations consistent with a vision for housing supported by the community.

## Likely Impacts to Infrastructure

All four scenarios contemplated for the planning area will require significant amounts of new infrastructure to support anticipated residential and non-residential growth. Scenario A requires the least amount of new infrastructure because it generally stops growth after the committed development inventory is built; for which, it is assumed infrastructure exists today or is already planned and funded as a condition of the various development approvals.

Scenarios B and C increase service areas for the County — Scenario C more than Scenario B — which will impact most "fixed infrastructure" in the planning area like roads, water, sewer, parks, schools, and fire stations. Scenario D reflects growth back into existing service areas, but will still require upsizing specific facilities to keep pace with demand. Other infrastructure categories — like police protection or emergency medical services — are more mobile and may be impacted less by preferred development types, locations, patterns, and intensities.

The scenario planning and likely impacts analysis looked broadly at demand for eight categories: public education, fire protection, police protection, emergency medical services, parks, water and sewer service, and roads. A brief summary of impacts and trade-offs between the four scenarios is provided below. More detailed information is available in the previous section of the report — the different infrastructure service packs tested — or in the technical appendix.

## Fire Protection

The six municipal and twenty rural fire departments in the planning area will be impacted differently by the four growth scenarios. Scenario A creates a demand for two new fire stations. Scenario B creates a demand for four new fire stations. Scenario C creates a demand for eight new fire stations, and Scenario D creates a demand for six new fire stations.

Rural fire departments will be more impacted by any of the scenarios because of limited funding and their volunteer firefighter systems. The Fire Districts of Whitesville (which recently opened a new fire station), Pine Ridge, Lebanon, and Cross will absorb most of the impacts from new development in nearly all the scenarios.

Recent changes at the County for how rural fire departments are funded will help the situation, but some rural departments may need to rely on professional fire fighters to keep up with increased demands in terms of the number of calls and their times of day. The six municipal fire departments will also be impacted, but none more than the stations serving the Cainhoy Peninsula.

## Police Protection & EMS Services

The ten law enforcement agencies in the planning area will be impacted by new growth and development. However, the Berkeley County Sheriff Department will be most impacted because a significant amount of growth in all four scenarios is anticipated outside of existing municipal limits (assuming no municipal annexations during the planning horizon). Scenario A contemplates up to 128 new sworn officers to meet future demand. Scenario B contemplates up to 201 new sworn officers to meet future demand. Scenarios C and D contemplate up to 315 new sworn officers to meet future demand. (Note: the demand for new sworn officers is based on population growth versus the form of development. This explains why the demand

for new officers in Scenarios C and D are the same.)

Demands for increased emergency medical services in the four scenarios also increases based on new residents expected for the planning area. 48 EMS personnel are anticipated to serve Scenario A. 67 new EMS personnel are anticipated to serve Scenario B. 92 new EMS personnel are anticipated to serve Scenarios C and D. Changes to the EMS operations model in the future will reduce the need to build or maintain fixed EMS stations; however, new resources will be needed to accommodate roving service areas that general follow demand (service calls).

## Parks & Recreation Facilities

Apart from Cypress Gardens and seven boat landings, the County itself maintains very few parks or recreation facilities in the planning area. Residents do benefit from close proximity to the Francis Marion National Forest, but it offers a limited type and number of recreation activities.

Neighborhood- and community-serving parks in the planning area are not evenly distributed in the planning area, and there exists a complex arrangement between city, town, special district, and homeowner association groups to maintain facilities in different park locations.

Assuming existing service delivery standards, the planning area will need several hundred acres of new parks to serve the different growth scenarios. Many of the new parks will be installed as amenities for master planned communities. But these facilities will likely not be open to the public unless specifically required to in a development approval. County residents may need to rely on school facilities, private clubs or associations, or parks

in municipalities to meet demand unless a new vision and implementing policies are included in the new Comprehensive Plan to start a process for instilling a county-led parks and recreation initiative.

## Roads & Stormwater Facilities

The County currently maintains 330 miles of roads — approximately 18% of all roads in the planning area. The remaining roads are maintained by the Federal Highway Administration, State of South Carolina, or private associations. For Scenario A, the County would maintain 66% of all new roads needed to serve new development (351 of 527 new road miles). For Scenario B, the number jumps to 74% of all new roads to serve an expanded development footprint (675 of 911 new road miles). For Scenario C, the number falls to 72% of all new roads to account for the expanded development footprint (977 of 1,343 new road miles). For Scenario D, the number jumps to 76% of all new roads (749 of 981 new road miles). Many of the new roads are assumed to be built by the developer, and transferred to the County for operation, maintenance, and replacement in the future after a period of warranty. Of note, the cost to upgrade rural intersections to meet the demands of suburban-level traffic in the future will also be expensive, and Scenarios B and C will be the most-costly because of they extend liberally into existing rural areas.

The County's storm sewer system will also grow to serve new development in the four scenarios: Scenario A requires 50 new stormwater main miles, Scenario B requires 110 new stormwater main miles, Scenario C requires 160 new stormwater main miles, and Scenario D requires 120 stormwater main miles.

## Water & Sewer Facilities

The County's water and sewer system will need to expand substantially to meet different demands associated with the four growth scenarios.  For Scenario A, 343 miles of new water lines and 391 miles of new sewer lines would be needed to meet the location and intensity of future development anticipated for the County's service district.  Demand numbers increase in the three remaining scenarios:  Scenario B increases to 684 miles of new water lines and 680 miles of new sewer lines, Scenario C increase to 1,008 miles of new water lines and 775 miles of new sewer lines, and Scenario D increases to 816 miles of new water lines and 768 miles of new sewer lines,  Of note, the capital costs to build new water and sewer lines in Scenario D is greater than Scenario C because some low-density development in Scenario C is assumed to use private wells and septic systems.  All development in Scenario D is assumed to be on the County's water and sewer system.

Other key features for an expanded water and sewer system to serve new development are summarized for the four scenarios in the infrastructure packs section of the report.

## Public Education

The Berkeley County School District serves the entire planning area, and demands are expected to increase for all four growth scenarios:  Scenario A increases demand by 18,872 students, Scenario B increases demand by 26,328 students, and Scenarios C and D increase new demand by 36,506 students.  Some new students could be accommodated in existing schools, or classroom and facility expansions at existing schools.  The expanded development footprint associated with Scenarios B and C could significantly impact the number of schools needed in the planning

area.  Busing and other student transportation costs could also increase in Scenarios B and C as new development extends far into rural areas.

## Cumulative Cost to Serve Statistics

Future year expenditure increases by infrastructure category for each of the four scenarios are reported in the infrastructure packs section of the report.  Cumulative statistics for all infrastructure categories combined, by scenario, are reported below.

Scenario A projects the lowest annual cost-to-serve in the final year of the twenty-year planning horizon ($91.6M), followed by Scenario B ($102.3M), Scenario D ($113.5M), and Scenario C ($115.7M).  Detailed tables summarizing expected expenditures for the different scenarios are provided in the technical appendix.

## Likely Revenue Impacts

Future year revenue increases for each of the scenarios are reported in the alternative growth scenarios section of the report (see the side-by-side scenario comparison table on pages 45-46).  Scenario A projects the lowest annual revenue in the final year of the twenty-year planning horizon ($126.4M), followed by Scenario B ($154.0M), Scenario C ($160.7M), and Scenario D ($167.9M).

It is important to note that the preferred land uses and densities in Scenario D favor compact, mixed-use development principles, which generally support higher assessed values per acre compared to the low-density, single-use development patterns favored in the other scenarios.  This is significant because Scenario D outperformed Scenario C in new revenue potential while accommodating the same, most aggressive residential growth

forecast in a much smaller development footprint.

It is also important to note that the revenue analysis does not encompass all forms of revenue for Berkeley County. This is particularly important for entities like the School District and County Water and Sanitation Utility that generate most of their revenue from sources other than property taxes. For example, while property tax is a significant portion of the School District's budget, most of their budget comes from state and federal sources. Berkeley County Water and Sanitation is primarily financed by residential and industrial consumers. Only stormwater relies on the County's property tax system (in this case, a special fee) for financing.

This situation makes a direct comparison of all revenue and expenditures (return-on-investment) potentially misleading, because not all sources of revenue nor all expenditures are accounted for in the analysis. However, by considering just the County government's revenue and expenses for the calculations, a more direct comparison can be made to support development of the new Comprehensive Plan. By excluding expenses and revenue from municipalities, utilities, and the school district, the focus becomes the services and facilities provided by Berkeley County; including stormwater and rural fire departments that rely on property tax special fee revenues.

## Return-on-Investment Potential

Information for return-on-investment (ROI) potential in Berkeley County is presented in terms of annual, reoccurring revenues and expenditures for the final year of a twenty-year planning horizon (2040). The ratio of annual revenue in the numerator to annual

expenditures in the denominator for each growth scenario represents its return-on-investment index. An index greater than 1.0 indicates annual revenues that are expected to be greater than annual expenditures, and the surplus would be available to the County to finance new construction or purchase new capital projects to serve the planning area.

Scenario C provides the lowest ROI index of the four scenarios at 1.22 for the final year of the twenty-year planning horizon, followed by Scenario A at 1.23, Scenario D at 1.30, and Scenario B at 1.34. Positive annual revenue conditions for all four scenarios provides funds to finance new construction or purchase new capital projects to serve the planning area.

It should be noted the ROI statistics measure performance in the final year of the twenty-year planning horizon, and the statistics may fluctuate from year-to-year in years one to nineteen based on the timing and magnitude of growth that occurs within each of the scenarios. And, the timing for construction of very large infrastructure projects in the planning area could dramatically impact the ROI potential for the County for interim years leading up to the final year of the twenty-year planning horizon.

## Building a Case for Urgency

Berkeley County has experienced a tremendous amount of residential and non-residential growth in the past and all signs point to significant growth potential long into the future. The County has leveraged its advantages to generate an enormous amount of residential and non-residential economic development potential, but growth can come with significant costs, many of which may not be immediately apparent. New infrastructure is often installed by the developer — roads

are held in warranty, and impact fees for water and sewer help offset costs of expanding those systems. Even the twenty-year horizon for the scenario planning and likely impacts analysis — chosen to be consistent with the planning horizon for the new Comprehensive Plan — is likely insufficient to fully estimate many long-term costs for the County. Roads typically require their first major rehabilitation after twenty to thirty years of use. Traffic signals and signs have a similar life span. The replacement and rehabilitation costs may be underestimated for this analysis given the life cycle of certain infrastructure. Many communities in the Northeast and Upper Midwest of the United States that boomed in the last century are dealing now with aging infrastructure and few (good) options for fixing it.

It is important that the Future Land Use Map for the new Comprehensive Plan be developed, in part, using the lessons learned from the four alternative growth scenarios presented in this report. Opportunities to maximize revenues, and minimize costs to serve, should be considered within the context of other needs for the comprehensive planning process.

This can be done in a number of ways. Shifting development into mixed-use development categories that generate greater values per acre may be the easiest way to accomplish shared goals. However, lessons learned from Scenario D also demonstrate that compact development patterns that need less infrastructure also benefit the community.