GEORGIA TRANSMISSION CORPORATION
ALTERNATIVES EVALUATION AND MACRO CORRIDOR STUDY

For the Proposed

Douglas – Lakeland Section of the

Douglas – Pine Grove Primary 230 kV Transmission Line Project

Atkinson, Berrien, Clinch, Coffee, and Lanier Counties, Georgia

Rural Utilities Service

prepared by:

Georgia Transmission Corporation

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List of Acronyms

AFB – Air Force Base
AHP – Analytical Hierarchy Process
APE – Area of Potential Effect
BMP – Best Management Practice
CFR – Code of Federal Regulations
cfs – cubic feet per second
CZMA – Coastal Zone Management Act
DEM – Digital Elevation Model
DOI – Department of Interior
DOT – Department of Transportation
EA – Environmental Assessment
EIS – Environmental Impact Statement
EMC – Electric Membership Corporation
EMF – Electromagnetic Field
EPRI – Electric Power Research Institute
FAA – Federal Aviation Administration
FEMA – Federal Emergency Management Agency
FONSI – Finding of No Significant Impact
GADNR – Georgia Department of Natural Resources
GCMP – Georgia Coastal Management Program
GDOT – Georgia Department of Transportation
GIS – Geographic Information Systems
GNHP – Georgia Natural Heritage Program
GPC – Georgia Power Company
GTC – Georgia Transmission Corporation
ITS – Georgia's Integrated Transmission System
kV – kilovolt
kW – kilowatt
MEAG – Municipal Electric Authority of Georgia
NEPA – National Environmental Policy Act
NERC – North America Electric Reliability Corporation
NHPA – National Historic Preservation Act
NPDES – National Pollutant Discharge Elimination System
NPS – National Park Service
NRCS – National Resource Conservation Service
NRHP – National Register of Historic Places
NWI – National Wetland Inventory
NWR – National Wildlife Refuge
RUS – Rural Utilities Service

SAS – Southeastern Archeological Services, Inc.
SERC – Southeastern Reliability Council
SHPO – State Historic Preservation Office
UGA – University of Georgia
USACE – U.S. Army Corps of Engineers
USEPA – U.S. Environmental Protection Agency
USC – United States Code
USFS – U.S. Forest Service
USGS – United States Geological Survey
USFWS – United States Fish and Wildlife Service
WMA – Wildlife Management Area

I. Introduction

Georgia Transmission Corporation (GTC) proposes to build a 230 kilovolt (kV) electric transmission line from the existing Douglas 115/230 kV Substation on the northwest side of the City of Douglas in Coffee County, Georgia to an existing transmission line corridor north of the City of Lakeland in Lanier County, Georgia. **Figure 1.** The project area is located in the Coastal Plains of South Georgia, east of Interstate 75, and northeast of the City of Valdosta. **Figure 2.**

GTC is an electric transmission cooperative established under the laws of the State of Georgia in 1997. The not-for-profit cooperative, headquartered in Tucker, GA, provides electrical transmission service by building, maintaining, and owning electric power transmission facilities (transmission lines and substations) to serve its retail electric distribution corporations (EMC) members. This includes 39 of the 42 customer-owned EMCs in the State of Georgia. The subject project area is in the service territory for Colquitt EMC, The Satilla Rural EMC, and Slash Pine EMC.

GTC, through its member systems, serves all or portions of 157 of the 159 counties in the State of Georgia. The membership of the distribution cooperatives consists of residential, commercial, and industrial consumers, generally within specific geographic areas, constituting about 4.4 million members served as of 2012. The number of members served represents more than 4.5 million people in a service area covering 40,000-square miles (103,602 square-kilometers), or nearly 73 percent of the land area of Georgia.

As of July 2012, GTC owns and maintains approximately 3,088 miles of transmission line and 647 transmission and distribution substations of various voltages. GTC provides transmission capacity to the member systems through participation in the Georgia Integrated Transmission System (ITS), which consists of transmission facilities owned jointly by GTC, Georgia Power Company (GPC), the Municipal Electric Authority of Georgia (MEAG), and the City of Dalton Utilities. Parity in ownership of the ITS depends on the load served by each of the owners and varies slightly from year to year, which requires that periodic financial adjustments be made. While the transmission of wholesale electrical power throughout the State of Georgia is dependent upon the cooperation of the owners of the ITS, each of these utilities competes for new loads above 900 kilowatts (kW) within the state.

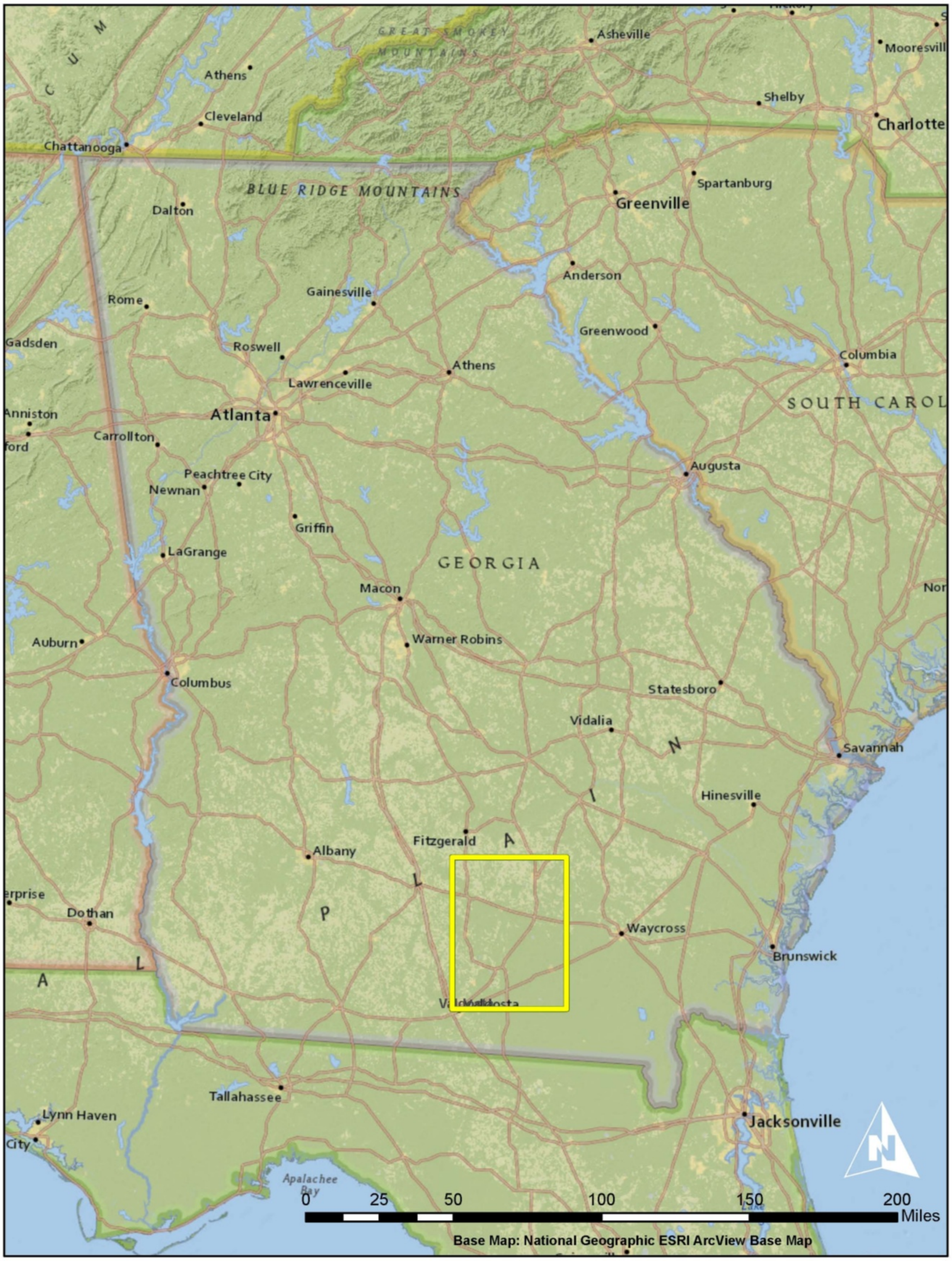
To finance the electric transmission line project described in this report, GTC is applying for loan funding from the Rural Utilities Service (RUS), which administers the U.S. Department of Agriculture's Rural Development Utilities Programs and makes direct loans and loan guarantees to electric utilities that serve customers in rural areas. The loans and loan guarantees finance the construction of electric distribution, transmission, and generation facilities, including system improvements and replacement required to furnish and improve electric service to rural areas, as well as demand side management, energy conservation programs, and on-grid and off-grid renewable energy systems.

Prior to making a financing decision, RUS is required to complete an environmental review process in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality's NEPA implementing regulations (40 Code of Federal Regulations (CFR) 1500–1508 and RUS's NEPA implementing regulations, Environmental Policies and Procedures (7 CFR Part 1794). Due to the length and voltage of the proposed project, RUS's Environmental Policies and Procedures require the completion of an Environmental Assessment (EA) with Scoping (7 CFR § 1794.24(b)(1)). RUS requires that applicants to its programs complete an Alternatives Evaluation and Macro-Corridor Study (AES/MCS) before the NEPA process begins for projects like the one being proposed (7 CFR § 1794.51(c)).

This report (or AES/MCS) describes the scope of the proposed project and includes: the project need, electrical alternatives, geographical study area, and potential corridors with in which a route would be selected. The intent of this report is to provide agencies, governments, and members of the public project-related information to help facilitate their active participation in RUS's NEPA process. Feedback provided to RUS through the scoping process will help to determine the scope of issues that will be addressed in subsequent environmental documents (i.e., the project's EA).

Figure 1 – Project Area

Figure 2 – Project Location



II. Alternative Evaluation

1. Project Justification

System studies are routinely conducted to identify potential thermal issues in Georgia. Thermal issues may arise when power flow increases and exceeds the design limits of power lines. The flow of power may increase due to load (consumer electricity use) increases, power generation changes, and proposed transmission expansion on the system. Hot weather, when usage is typically at its greatest, also adds to the thermal issue.

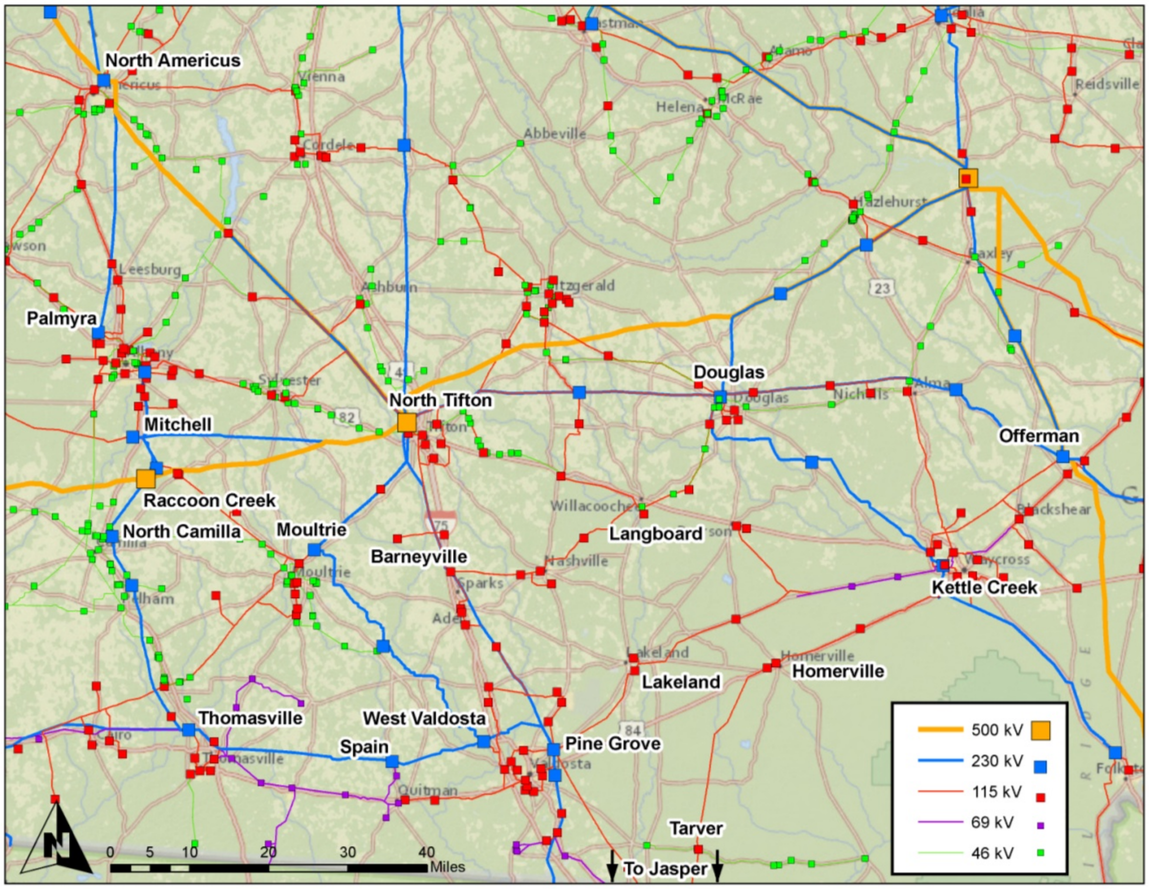
When thermal limits are reached, energized conductors (wires that conduct electricity) may sag and lose tensile strength. The result would be loss of needed safety clearance to underlying infrastructure and/or the ground. The result would be loss of conductor life, equipment damage, and power outages due to overload conditions.

Recently conducted analysis based on anticipated system conditions indicates that several facilities in South Georgia could experience thermal issues under contingency situations by 2015. Causes of these thermal issues are projected load growth, changes in generation patterns, and older transmission lines with limited capacity. The term contingency refers to the ability of the electrical system to recover or maintain service due to an emergency or system disruption to a component of the electrical grid. This can be caused by natural phenomena such as weather, tree fall, animal interaction, etc. or by equipment failure. The most critical of these thermal issues were identified on the following facilities: **Figure 3.**

- North Tifton 500/230kV Transformer
- North Tifton – Pine Grove 230kV Line
- Raccoon Creek – Thomasville 230kV Line
- Offerman 230/115kV Transformers (#1 & #2)

Areas from Thomasville, Georgia to Waycross, Georgia could experience loss of services due to thermal overloads. Included in this area are Colquitt EMC, Okefenoke Rural EMC, Slash Pine EMC, and The Satilla Rural EMC members as well as GPC, City of Adel, City of Douglas, City of Moultrie, City of Quitman, and City of Thomasville customers.

Figure 3 – Georgia Integrated Transmission System Map, South Central Georgia



2. Electrical Alternatives

Five electrical alternatives were studied (including the no action alternative) as potential solutions to the thermal issues in South Georgia.

A. No Action Alternative

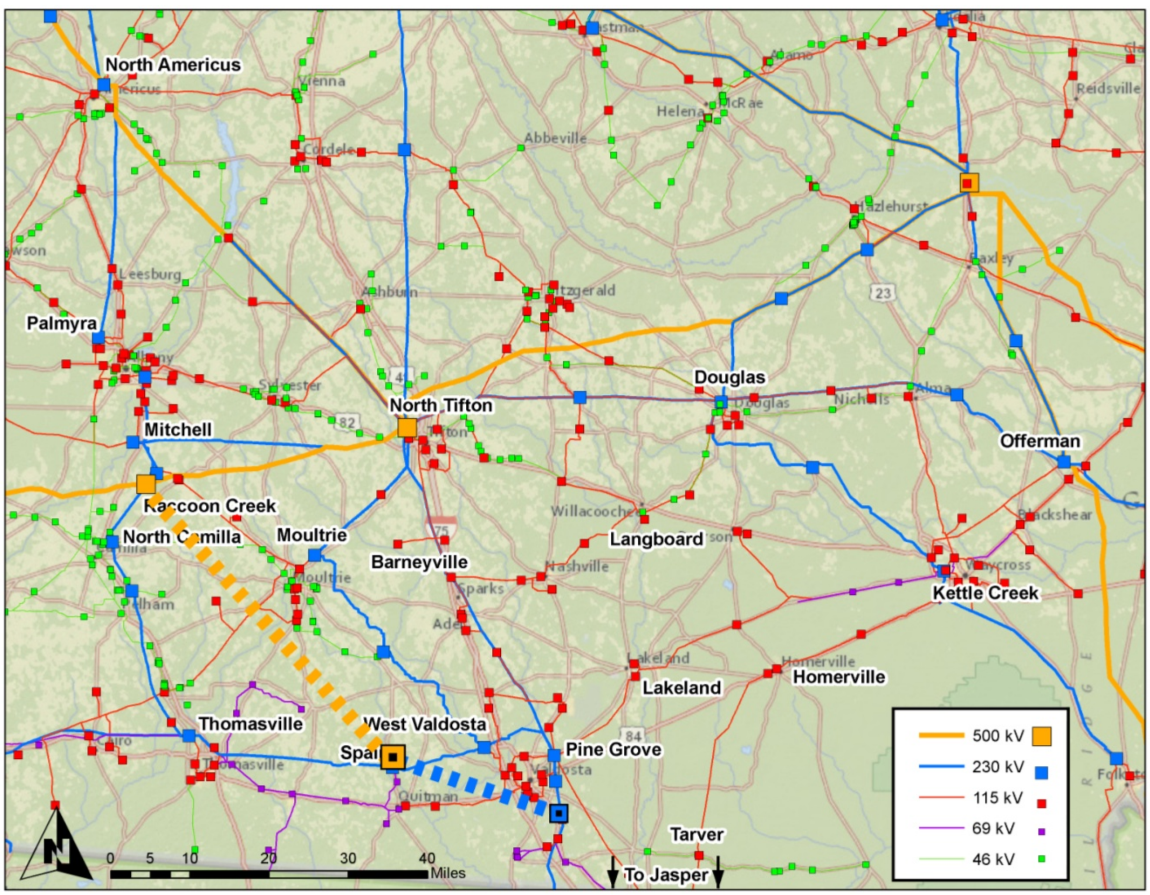
The No Action Alternative would not propose any new projects to address the thermal issues in the area. This alternative would reduce service reliability in the South Georgia area under contingency situations. It would also result in numerous violations of the transmission planning guidelines put forth by GTC, ITS, the Southeastern Reliability Council (SERC), and the North American Electric Reliability Corporation (NERC). Due to the results of the No Action Alternative, this alterative is considered unreasonable. However, it will be brought forward in RUS's NEPA process as required by 40 CFR § 1502.14(d).

B. Alternative #1

Alternative #1 would construct a new 500 kV Transmission Line from the Raccoon Creek Substation to the Spain Substation. It would require a new 230/500 kV substation to be built adjacent to the existing Spain 230kV Substation. In addition, it would require the construction of the Spain – Hickory Grove 230 kV Transmission Line and the Hickory Grove 230 kV Switching Station. **Figure 4.**

This plan addresses all thermal issues and voltage problems. However, this is the most costly alternative. Due to the amount of construction, this plan could not meet a 2015 in-service or need date. Therefore, this electrical alternative was eliminated from further consideration.

Figure 4 –Electrical Alternative #1 Map

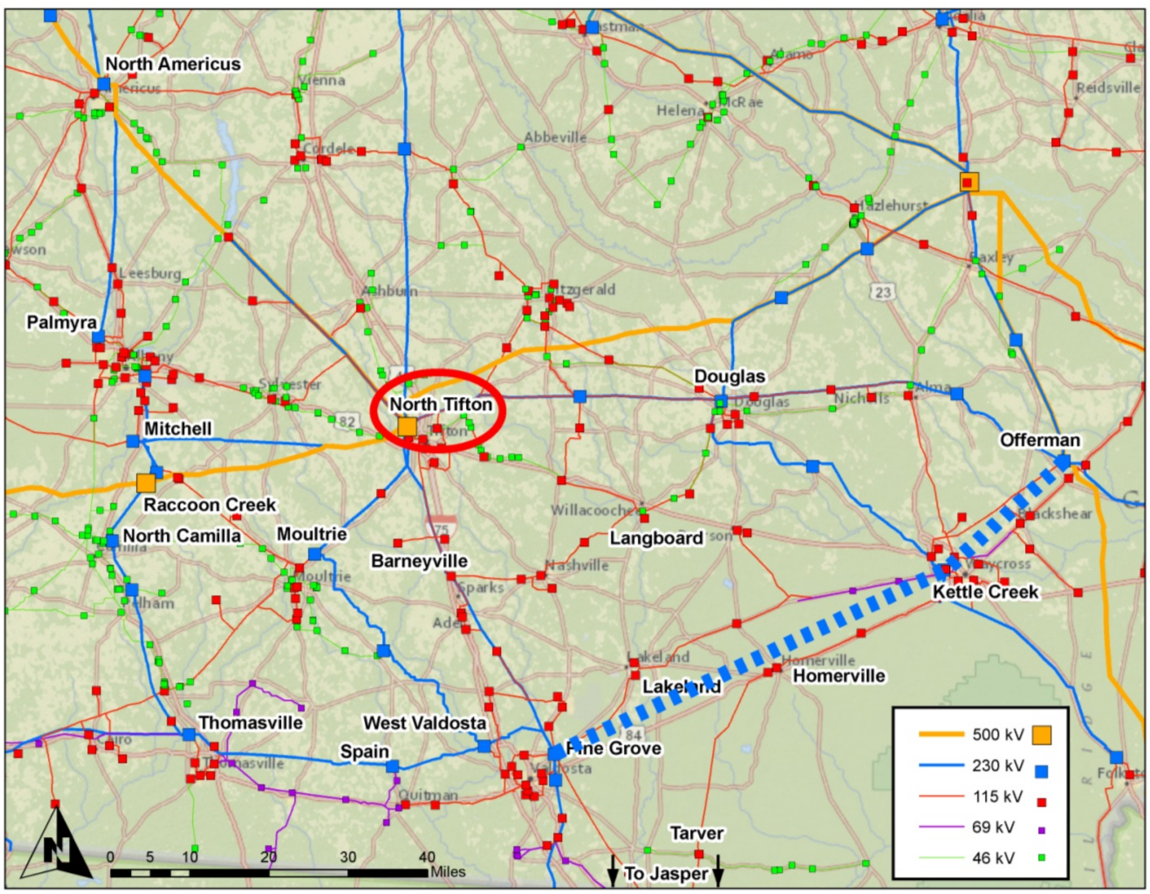


C. Alternative #2

Alternative #2 would require the construction of the Kettle Creek – Offerman 230 kV Transmission Line and the Kettle Creek – Pine Grove 230 kV Transmission Line. In addition, this plan would require a transformer upgrade at the North Tifton 500/230 kV Substation. **Figure 5.**

This plan would only address approximately half of the thermal issues identified. It would also place additional loading on the Kettle Creek – Homerville – Tarver – Jasper 115kV circuit. The plan would cause five existing 115 kV transmission lines and the Raccoon Creek – North Camilla 230 kV Transmission Line to be rebuilt by 2020. This alternative also yielded the lowest drop in loading on the North Tifton – Pine Grove 230 kV Transmission Line.

Figure 5 –Electrical Alternative #2 Map



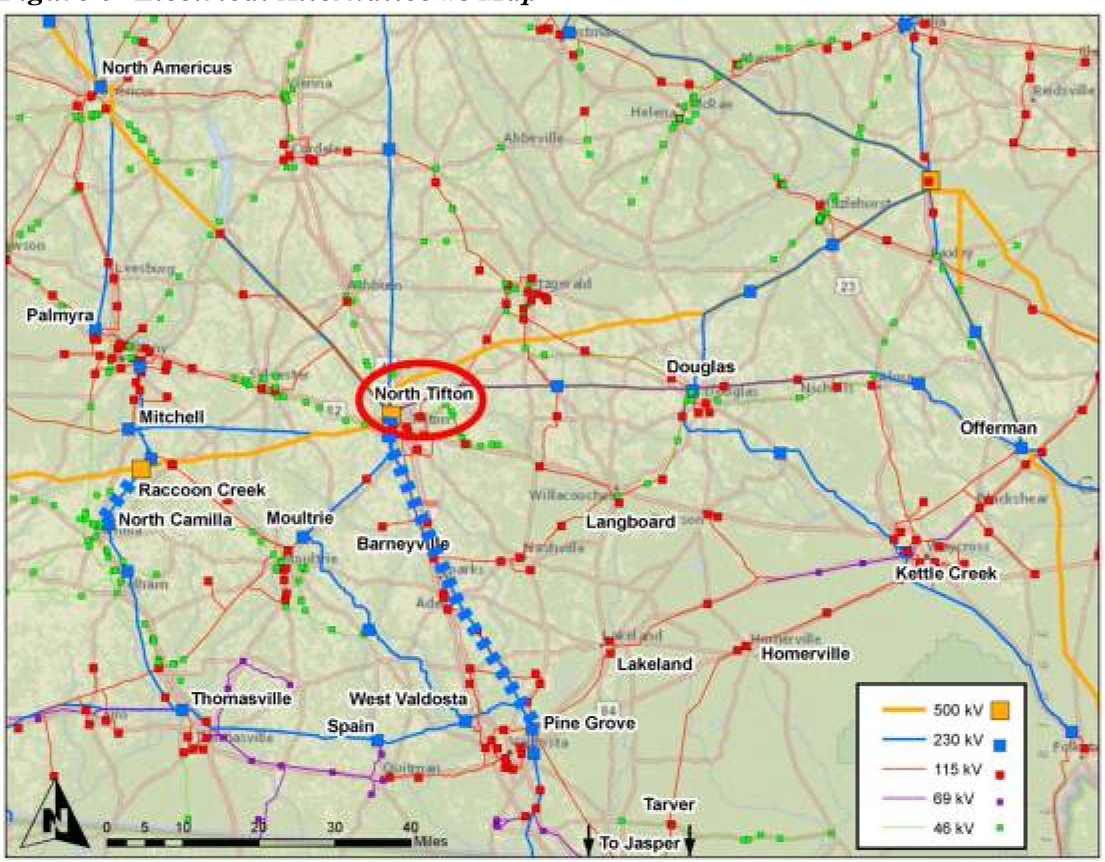
D. Alternative #3

Alternative #3 would require re-conductoring or rebuilding of the North Tifton – Pine Grove 230 kV Transmission Line. In addition, this plan would require a transformer upgrade at the North Tifton 500/230 kV Substation. **Figure 6.**

This plan only addresses a portion of the thermal issues. The plan would cause several existing 115 kV transmission lines and the Raccoon Creek – North Camilla 230 kV Transmission Line to be rebuilt. A review of the off-peak load operation conditions on the North Tifton – Pine Grove 230 kV Transmission Line has revealed that the necessary outage to conduct the work is not feasible for a rebuild of this line. Without the availability of an outage, this alternative is not viable.

An alternative to the rebuild of the 230 kV line in this plan, would be to build an additional line parallel to the existing North Tifton – Pine Grove 230 kV Transmission Line. However, this option would have the same construction outage issues and common corridor issues.

Figure 6 –Electrical Alternative #3 Map



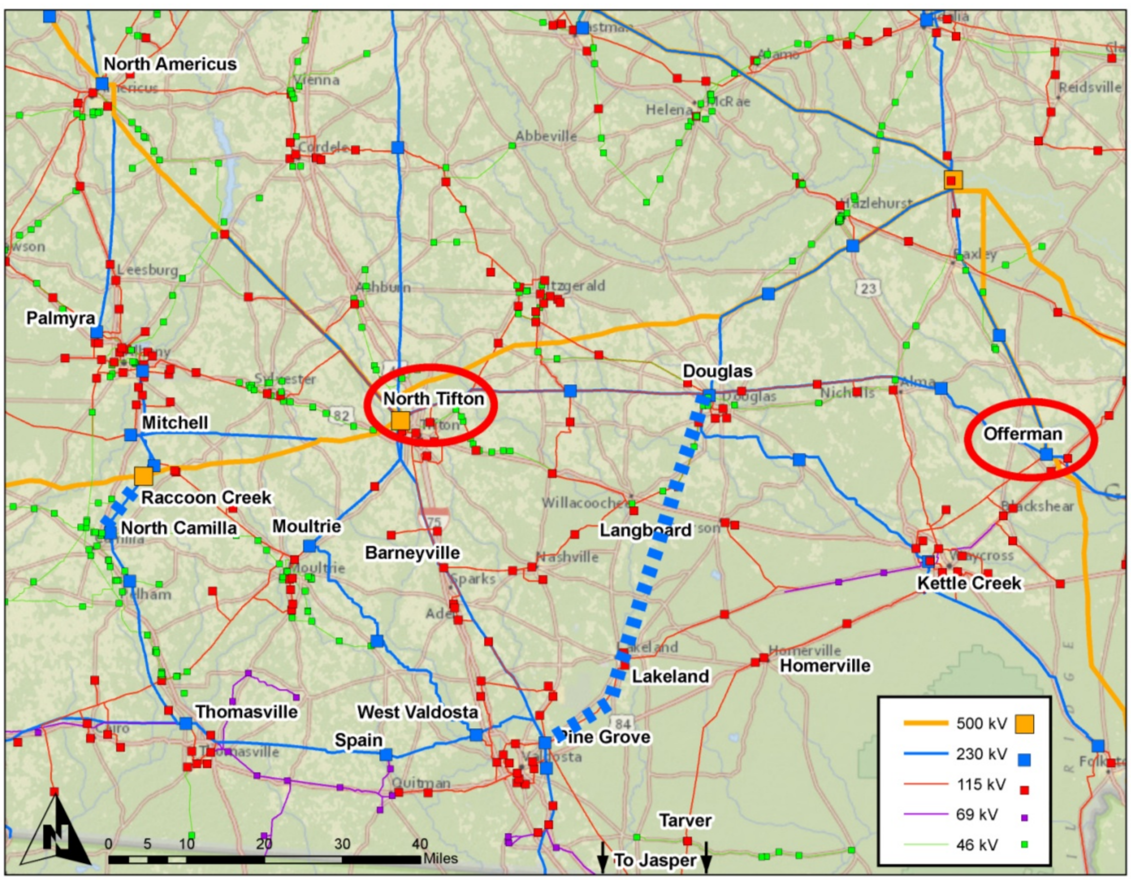
E. Alternative #4

Alternative #4 would require the construction of the new Douglas – Pine Grove 230 kV Transmission Line. The plan would require rebuilding or re-conductoring the existing Raccoon Creek – North Camilla 230 kV Transmission Line. In addition, this plan would require a transformer upgrade at the North Tifton 500/230 kV Substation and two transformer upgrades at the Offerman 230/115 kV Substation. **Figure 7.**

This plan addresses all 230 kV thermal loading issues identified the South Georgia assessment. It addresses loading issues on the 115 kV transmission lines more effectively. It also provides the most significant drop on the loading of the North Tifton – Pine Grove 230 kV Transmission Line.

This solution also supports other long-range plans for an additional site in South Georgia for a 500/230kV transformer other than at the North Tifton substation and for a new 230/115 kV substation in the Langboard area.

Figure 7 –Electrical Alternative #4 Map



3. Preferred Solution

Alterative #4 is the preferred solution. **Figure 7.** This solution addresses all thermal issues identified in the assessment unlike the No Action Alternative, Alternative #2, and Alternative #3. It is also reasonably meets the required need date unlike Alternative #1. **Table 1.**

Table 1: Electrical Alternatives Comparison

	Effectiveness to Address Thermal Issues	Probability to Meet Project Need Date	Project Cost	Viable Solution
No Action Alternative	Does not address any thermal issues and reduces area service reliability	N/A	No cost	NO
Alternative #1	Adequately addresses thermal issues	Low probability to meet project need date	Most costly	NO
Alternative #2	Reduces only some of the thermal issues and adds loading issues	Reasonable to meet need date	Reasonable project cost	YES, but would require additional rebuild projects for 2020
Alternative #3	Reduces only some of the thermal issues and adds loading issues	Unable to get needed outages of existing facilities to complete this solution	Reasonable project cost if viable	NO
Alternative #4	Adequately addresses thermal issues	Reasonable to meet need date	Reasonable project cost	YES

The components of this plan include: **Figure 8**

- Construction of the Douglas – Pine Grove Primary 230 kV Transmission Line
    - Douglas – Lakeland 230 kV Transmission
    - Pine Grove Primary – Lakeland 230 kV Transmission
- Re-conductor of the Raccoon Creek – North Camilla 230 kV Transmission Line
- North Tifton 500/230 kV Transformer Upgrade
- Offerman 230/115 kV Transformer #1 and #2 Upgrade

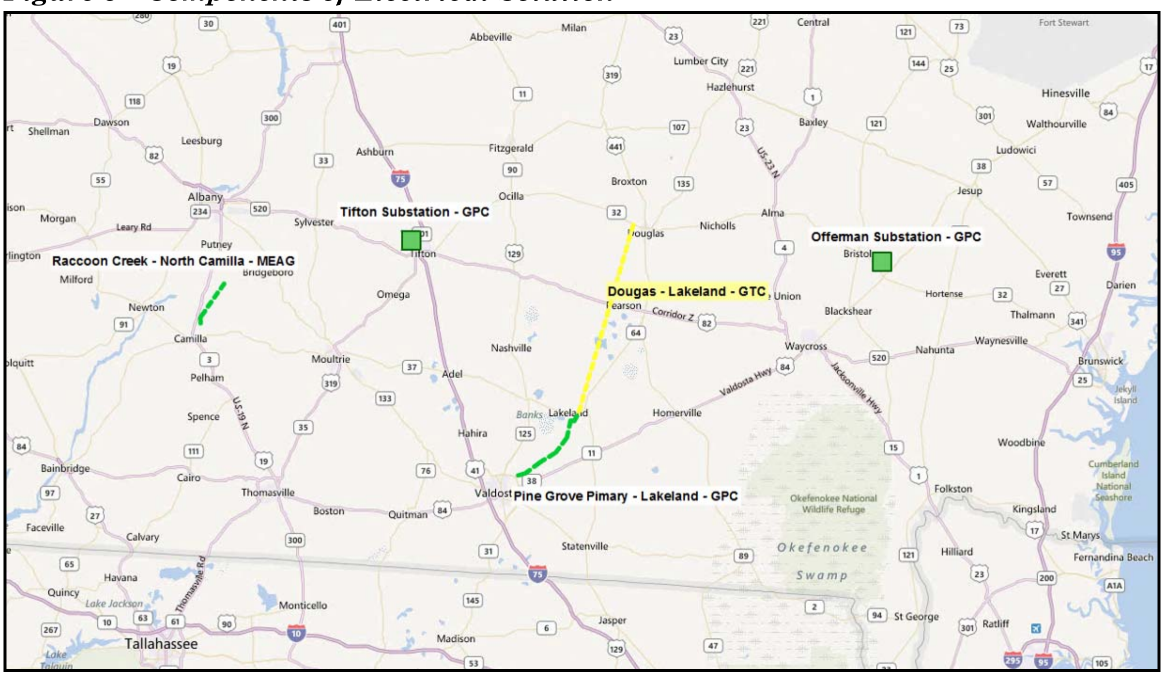
The GPC owns the Tifton and Offerman substations. Therefore, these upgrades would be completed by GPC.

The MEAG owns the Raccoon Creek – North Camilla 230 kV Transmission Line. Therefore, MEAG would perform this portion of the plan.

The proposed Douglas – Pine Grove Primary 230 kV Transmission Line is a new line. GPC owns an existing 115kV transmission line from the Pine Grove Primary Substation to the Lakeland Area. GPC has accepted the responsibility to rebuild this existing corridor from an 115kV transmission line to a 230/115 kV double circuited line or to parallel their existing 115 kV transmission line with a new 230 kV transmission line from Pine Grove Primary to the Lakeland area near the existing North Lakeland Tap 115 kV Transmission Line. This section of the proposed project is approximately 17 miles.

GTC has agreed to construct the new transmission line from the Lakeland area to the existing Douglas 230/115 kV Substation. The straight-line distance for this section of the project is 35.5 miles.

Figure 8 – Components of Electrical Solution



III. Connected Actions

The GTC portion of the electrical solution, which is the focus of the AES/MCS, begins at the existing Douglas 115/230 kV Substation and would end at GPC's termination point in an area near the City of Lakeland along the existing GPC Kettle Creek Primary – Pine Grove Primary 115 kV Transmission Line. The straight line distance of this project is 35.5 miles.

GPC's proposed Pine Grove Primary – Lakeland 230 kV Transmission Line would connect directly to the south end of the proposed GTC Douglas – Lakeland 230 kV Transmission Line portion of the electrical solution. Siting of the GPC segment is not included in the AES/MCS because GTC lacks control over GPC's siting/decision-making process. The future EA would disclose impacts associated with GPC's segment as a connected action. However, mitigation (if identified) would not be imposed on the Pine Grove Primary – Lakeland portion of this project as GTC would not own or construct this line segment.

Other components of the electrical solution include the rebuild of the existing Raccoon Creek – North Camilla Transmission, North Tifton 500 kV transformer upgrade, and the Offerman 230 kV #1 and #2 transformer upgrade. These three components are separated from GTC's proposed Douglas – Lakeland 230 kV Transmission Line by 30 – 60 miles.

1. Proposed Pine Grove Primary – Lakeland 230 kV Transmission Line

GPC owns and operates the existing Kettle Creek Primary – Pine Grove Primary 115 kV Transmission Line. The existing Pine Grove Primary 115/230 kV Substation is located on US Highway 221. It is on the northeastern edge of the City of Valdosta in Lowndes County, GA. The existing transmission line extends northeast to the City of Lakeland and the existing Lakeland 115 kV Substation in Lanier County, Georgia. At which point, the existing line turns more towards the east to the existing Kettle Creek Primary 115/230kV Substation. The total length of existing GPC Kettle Creek Primary – Pine Grove Primary 115 kV Transmission Line is approximately 60 miles. The section for Pine Grove Primary to Lakeland is approximately 17 miles. The length of the 17 mile section is almost equally divided between Lowndes County, Georgia and Lanier County, Georgia.

Due to the GPC ownership of the existing Kettle Creek Primary – Pine Grove Primary 115 kV Transmission Line and Lakeland being a logical break point geographically, GPC has chosen to build this section of the proposed Douglas – Pine

Grove 230 kV Transmission Line solution from the existing Pine Grove Primary 115/230 kV Substation to the Lakeland Area.

The existing transmission line corridor is south and east of Moody Air Force Base (AFB), Banks Lake National Wildlife Refuge (NWR), and the Grand Bay Wildlife Management Area (WMA). The corridor is east of US Highway 221 except when crossing the highway to reach the Pine Grove Primary Substation. The corridor is also, north of US Highway 84 and approximately 3 miles north of the Community of Naylor. Land use consists of cultivated fields, planted pines, and residential areas closer to the project end points near Pine Grove and the City of Lakeland.

The existing corridor crosses Grand Bay Creek and skirts the edges of several wetlands including Darsey Pond, Fish Pond Bay, George Carter Island Bay, and Becky Bay. There are no historic sites listed on the National Register of Historic Places (NRHP) in close proximity. **Figure 8**

2. **Re-conductor Raccoon Creek – North Camilla 230 kV Transmission Line**

The existing MEAG Raccoon Creek – North Camilla 230 kV Transmission Line would need to be re-conductored. Due to MEAG's ownership, this line would likely be conducted by MEAG. This would require replacing wires with a different wire type that would accommodate greater load. This may require some or all of the structures to be replaced. The current structures are predominately a steel, lattice h-frame design. The total length of the line is approximately 9 miles, and there are 62 structures along the existing line.

The existing Raccoon Creek – North Camilla 230 kV Transmission is located in Mitchell County, Georgia. It is north of the City of Camilla and just east of the City of Baconton. It is approximately 12 miles south of the City of Albany in Dougherty County, Georgia. This line is in a rural setting. Land use consists of cultivated fields with center pivot irrigation and planted pines. There are wetlands and floodplain on the north end of the line associated with Raccoon Creek (a tributary of the Flint River) and wetlands and floodplains on the south end associated with low lying areas.

The existing line does not cross US highways or Georgia state routes. It is east of US Highway 19/State Route 300, north of State Route 37, west of State Route 112, and south of State Route 93. There are no historic sites listed on the NRHP in close proximity.

The existing Raccoon Creek – North Camilla 230 kV Transmission Line is approximately 60 miles west of GTC's proposed Douglas – Lakeland 230 kV Transmission Line project area. **Figure 8**

3. **North Tifton 500/230 kV Transformer Upgrade**

GPC owns and operates the existing North Tifton 500/230 kV Substation. Due to their ownership, GPC will likely conduct the transformer upgrade needed for the electrical solution. The transformer upgrade would take place within the existing substation fence and would not require additional land disturbance.

North Tifton substation is located in Tift County, Georgia on the northwestern edge of the City of Tifton. The substation is located in an upland area approximately 1.5 miles west of Interstate 75 and approximately 2 miles east of the Little River. The substation is surrounded by residential development, cultivated fields, and forested land.

The existing North Tifton Substation is approximately 30 miles west of GTC's proposed Douglas – Lakeland 230 kV Transmission Line project area. **Figure 8**

4. **Offerman 230/115 kV Transformer #1 and #2 Upgrade**

GPC owns and operates the existing Offerman 230/115 kV Substation. Due to their ownership, GPC will likely conduct the transformer upgrades needed for the electrical solution. The transformer upgrades would include transformers #1 and #2. The upgrade would take place within the existing substation fence and would not require additional land disturbance.

North Tifton substation is located in Pierce County, Georgia. The substation is located 1 mile northwest of the City of Offerman and 1.8 miles north of the City of Patterson. The substation is located in an upland area near a tributary of the Sixty Foot Branch and 3.4 miles south of Big Satilla Creek. The substation is located in an agricultural area, approximately 1.5 miles east of State Route 32.

The existing Offerman Substation is approximately 40 miles east of GTC's proposed Douglas – Lakeland 230 kV Transmission Line project area. **Figure 8**

IV. Project Description

Once a final route is selected, GTC proposes to acquire easements 100 feet in width for cross-county sections. For sections that parallel highways or county roads, the width of easement may vary between 35 – 50 feet. A wider easement may be needed in some sections for design reasons. In addition, temporary lay down yards may be needed to store and stage materials and equipment during construction. These areas are identified in cleared, upland areas and the locations are negotiated with local landowners. There are several existing transmission lines in the study area that this proposed project could co-locate. In these situations, little or no additional easements may need to be acquired. Co-location will depend on existing easements rights, the configuration of the existing facility, environmental limitations, and engineering requirements. Many of these details are not known at this point in the project schedule.

Prior to line construction, easements would be cleared of all woody vegetation, and soils would be stabilized. GTC would also identify and remove danger trees along the proposed transmission line route after the initial clearing of the easement. Danger trees are diseased, dead, or leaning trees that pose a threat of falling into the transmission line. GTC would comply with the standards required by the Georgia Erosion and Sedimentation Control Act of 1975, as amended, which mandates that appropriate erosion control measures such as seeding, straw bales, silt screens, and vegetative buffers be utilized where appropriate to prevent degradation of surface water quality during construction and operation of facilities. In environmentally sensitive areas, special techniques would be used to minimize impacts.

Most transmission line structures would be single-pole concrete structures. Cross-country designs would likely use delta configurations with two conductors (wires) on one side of the pole and one on the other. Roadside designs would likely use vertical configurations with all three conductors on one side of the pole. **Figure 9.** Depending on terrain, existing utilities, and engineering requirements, pole heights for the corridor would range from approximately 75 to 110 feet above ground and would generally be placed at intervals of 400 to 650 feet apart.

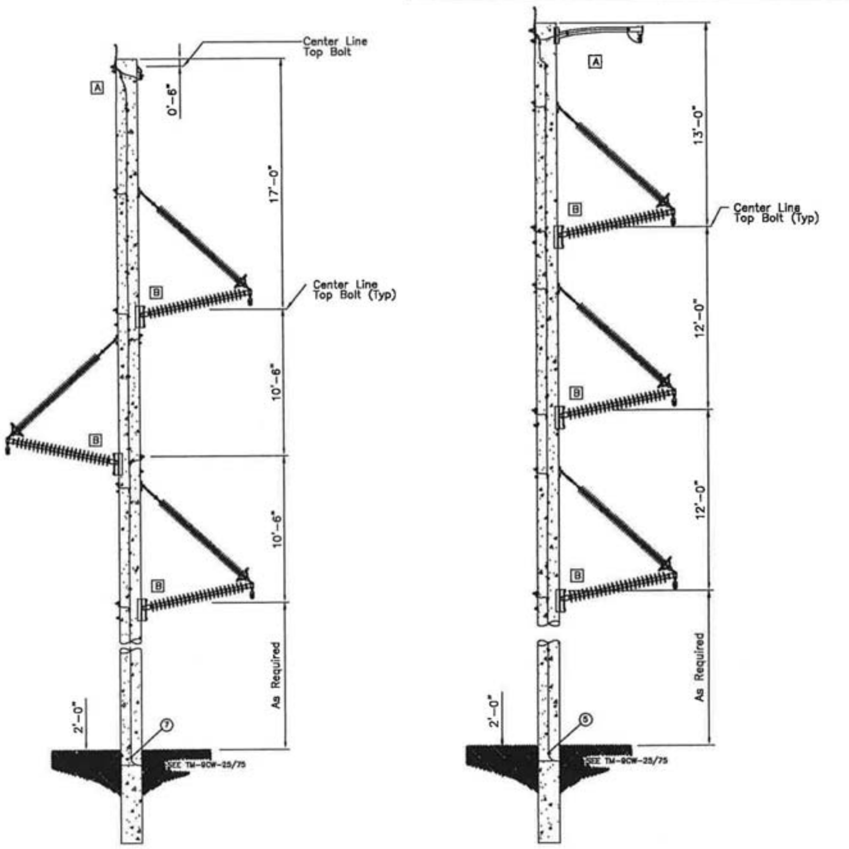
Other types of structures may be used to minimize impacts to sensitive resources, increase span length, gain more clearance from other infrastructure, or better handle angles or terrain. The structures may include but are not limited to a single-pole steel structure, a three-pole structure, or a steel lattice H-frame structure.

If sections of the proposed route co-locate with existing transmission corridors, structure types would be designed to accommodate both lines. These structures are known as double circuit transmission lines. For designs with one circuit on one side and one on the other, the height of the structures is comparable to designs discussed previously. However, if the design requires that both circuits be located on one side (vertical), the poles could range between in height from 100 – 135 feet.

Access during construction and maintenance of the line would remain within the transmission line easement where reasonable and with access from public rights-of-way. Vehicular crossings of streams and wetlands maybe needed. All vehicular crossings in streams and wetlands that fall under the jurisdiction of the U.S. Army Corps of Engineers (USACE) will be permitted. Easements may be acquired for access roads outside the transmission line easement to avoid vehicular crossings of sensitive areas such as federally listed species and their habitat, historic properties (i.e., important archeological sites), streams, stream buffers, wetlands, steep slope, etc.

Construction and maintenance of the proposed transmission line would follow guidelines noted in Environmental Criteria for Electrical Transmission Systems published jointly by the United States Departments of Agriculture and Interior. After project completion, vegetation management would occur every three years. Vegetation management includes mowing and herbicide use in areas where mowing is not practical.

Figure 9 – Typical Structure Design



Cross-Country Configuration Roadside Configuration

V. Study Area

1. Study Area Delineation

For projects of this scope, GTC incorporates a computer-based methodology that was jointly developed by the Electric Power Research Institute (EPRI) and GTC in 2003. GTC uses the EPRI-GTC Methodology as a tool to evaluate the suitability of landscape features, define a study area, generate alternative corridors, and select a reasonable route.

The first step of the methodology is to determine a study area to focus data collection. **Figure 10.** The study area is based on First Phase of Corridors (also known as Macro Corridors), with connectivity between the projects termination points. Phase one corridors are based on existing electric transmission line corridors, existing transportation corridors, land use patterns, topographic slope, and areas of least preference. **Figure 11.** Data incorporated in this phase of the analysis are readily available geographic information system (GIS) datasets. Datasets are converted to raster data or grids. The cells within the grids are assigned a suitability value, 1 being most suitable and 9 being least suitable.

Areas of Least Preference are modeled so that the Phase One Corridors that are generated will not cross them. Features are identified as Least Preference due to engineering constraints, regulatory issues, or cultural significance.

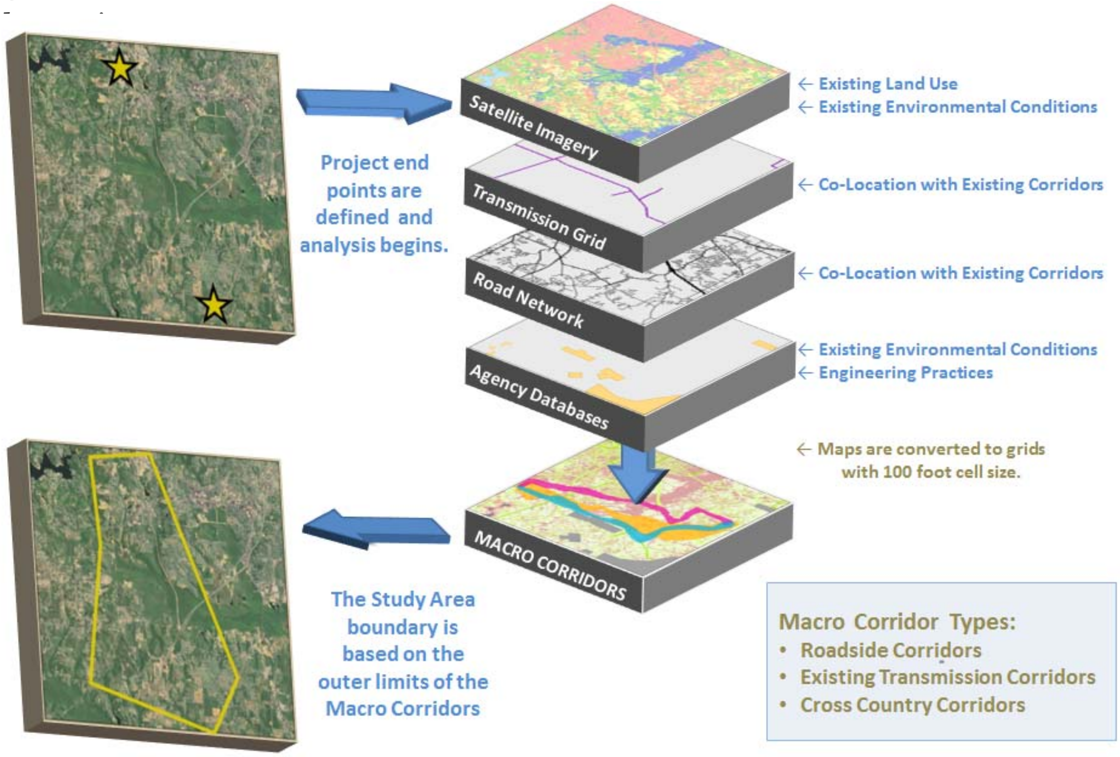
Areas of Least Preference are:

- Listed Archaeology Sites
- Listed NRHP Districts and Buildings
- Airports/Airstrips
- USEPA Superfund Sites
- Non-Spannable Waterbodies
- State and National Parks
- Military Facilities
- Mines, Quarries, Landfills
- USFS Wilderness Areas
- Wild and Scenic Rivers
- National Wildlife Refuges

The cells are 100 square feet in scale. Once values are assigned, a routing algorithm is applied across the suitability surfaces to produce the corridors. **Figure 10.** The corridors are analyzed, and a boundary is defined using the corridors as a guide. **Figures 11, 12 & 13.**

Subsequent steps of the methodology are discussed later in this document.

Figure 10–Macro Corridor



The information depicted in this illustration is only for demonstration and not specific to the subject project.

Figure 11–Macro Corridor Data

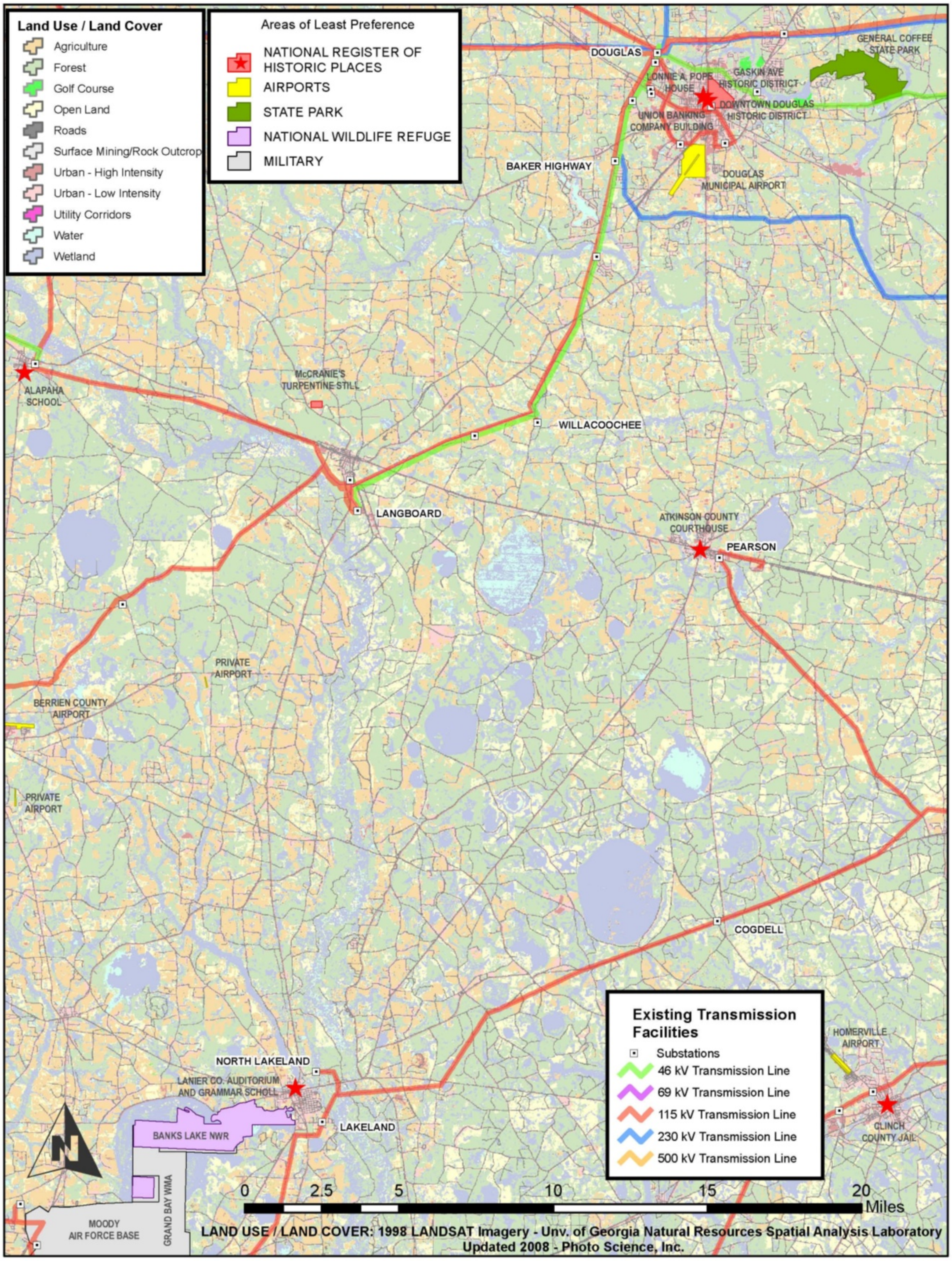


Figure 12 –Macro Corridor

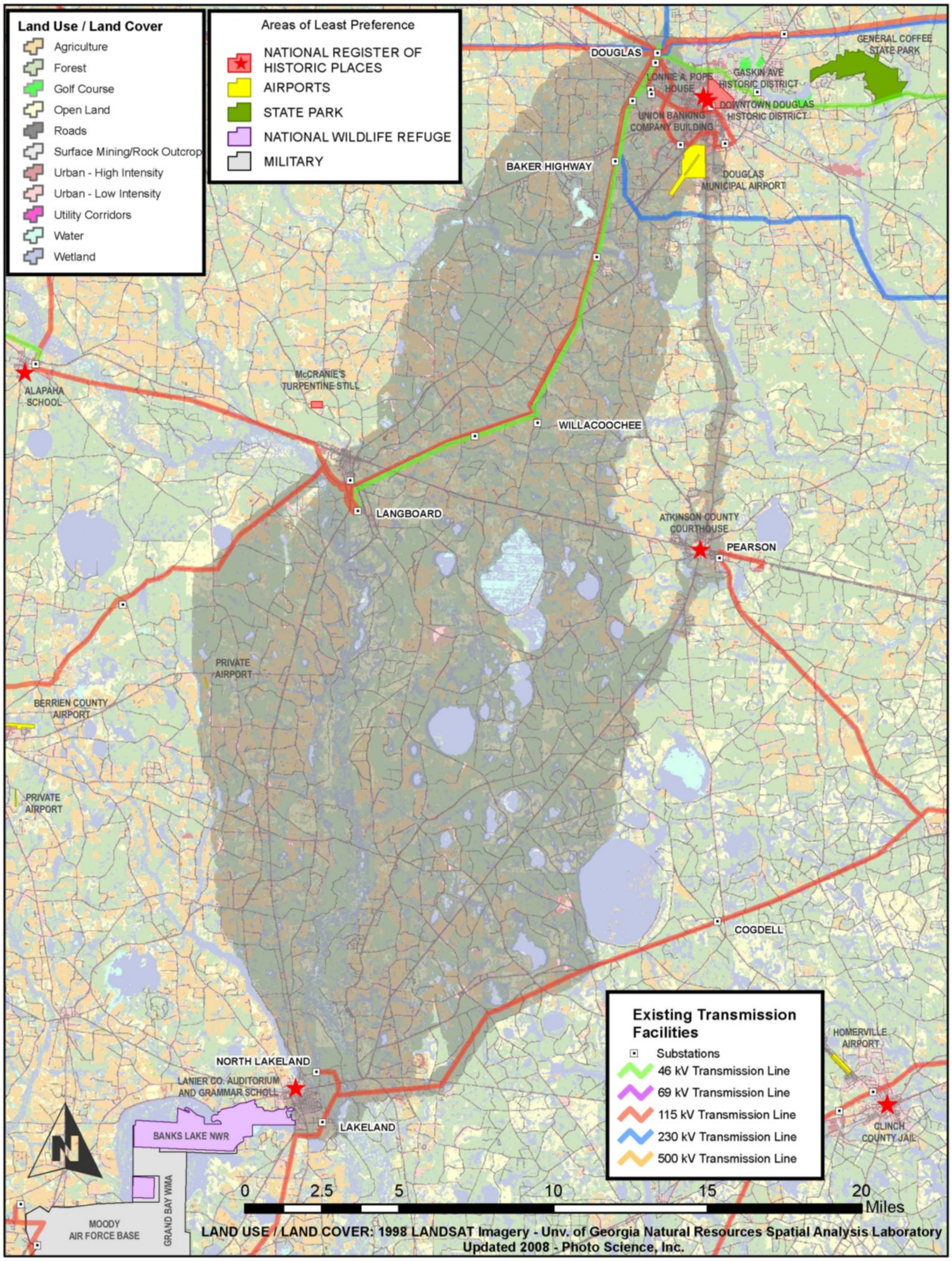
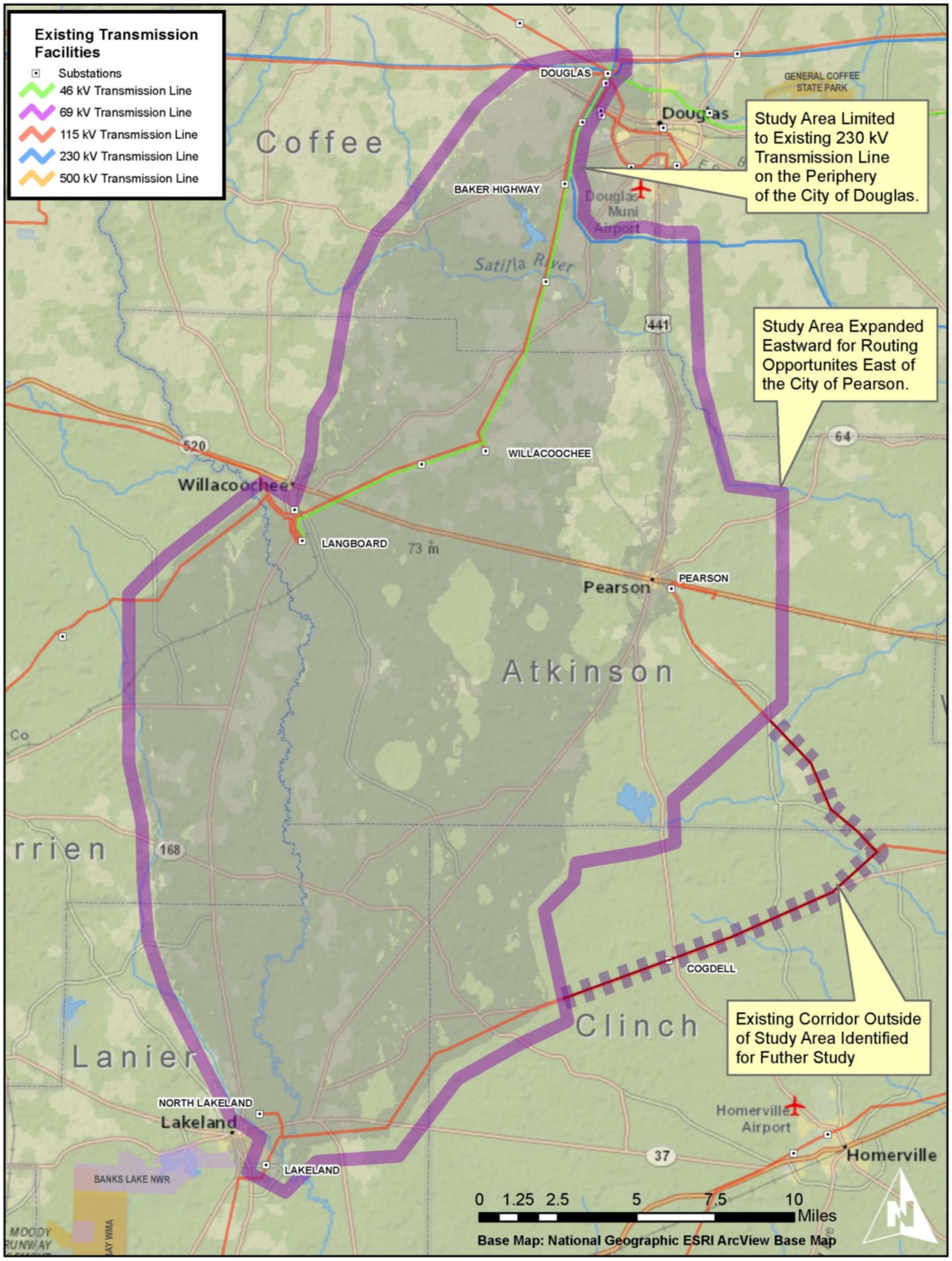


Figure 13 –Study Area Delineation


Existing Transmission Facilities
Substations
46 kV Transmission Line
69 kV Transmission Line
115 kV Transmission Line
230 kV Transmission Line
500 kV Transmission Line
Study Area Limited to Existing 230 kV Transmission Line on the Periphery of the City of Douglas.
Study Area Expanded Eastward for Routing Opportunites East of the City of Pearson.
Existing Corridor Outside of Study Area Identified for Futher Study
Coffee
Atkinson
Clinch
Lanier
DOUGLAS
Douglas
GENERAL COFFEE STATE PARK
BAKER HIGHWAY
Douglas Muni Airport
WILLACOOCHEE
Willacoochee
LANGBOARD
Pearson
PEARSON
COGDELL
NORTH LAKELAND
Lakeland
LAKELAND
BANKS LAKE NWR
Homerville Airport
Homerville
0 1.25 2.5 5 7.5 10 Miles
Base Map: National Geographic ESRI ArcView Base Map

2. Study Area Location

The study area for the proposed Douglas – Lakeland project is located in Southeast Georgia. The project area intersects five counties: Atkinson, Berrien, Clinch, Coffee, and Lanier. Four incorporated cities are in or adjacent to the study area: Douglas, Pearson, Willachoochee, and Lakeland. The Study Area includes 286,000 total acres.

Other communities in the project area include:

- Bannockburn
- Bethel
- Cogdell
- Courthouse
- Henderson Still
- Hilliard's Pond
- Kirkland
- Leliaton
- Mexico Crossing
- Mora
- Oberry
- Sandy Bottom
- Sirmans

The study area contains or intersects with the following 7.5 minute USGS Quadrangles: **Table 2.**

Table 2: USGS 7.5 Minute Quadrangles

Quad Name	Index Code
Broxton South	3182E8
Douglas South	3182D7
Hastings Fish Pond	3183B1
Henderson Still	3182B8
Kirkland	3182C8
Lakeland	3183A1
Lax	3183D1
Mora	3182D8
Pearson	3182C7
Sandy Bottom	3182B7
Sirmans	3182A8
Willachoochee	3183C1

3. Study Area Characteristics

A. Physiography/Climate

In general, the project area is higher in elevation in the north and decreases in elevation towards the southeast. Likewise, wetland systems become more extensive from northwest to southeast. The project area is located at the convergence of the Bacon Terraces, Okefenokee Basin, and Tifton Upland District Physiographic Regions of Georgia. **Figure 14.** The Bacon Terraces are very subtle terraces that run parallel to the coast. This region occupies much of the northeastern portion of the project area within the Satilla River Basin. The Okefenokee Basin is a low relief area varying for 75 to 240 feet above sea level. It contains numerous wetlands, the largest being the Okefenokee Swamp. This area occupies the southeastern portion of the project area and drains into the Suwannee River. The Tifton Upland District is characterized by narrow, rounded interfluves (or small ridgelines) separated by narrow valleys. This area occurs in the western portion of the project area within the Alapaha River Basin. The elevations in the project area range from 150ft in the south to 240 feet in the north. **Figure 15.** The Satilla River and Alapaha River are the primary waterways that occur in the project area. (Georgia Info http://georgiainfo.galileo.usg.edu/welcome.htm)

Most of the soils in the project area are not classified as prime farmland soils. **Figure 16.** A current soil suvey for Clinch County has not been published. However, the nature of the northwest section of Clinch County that lies in the study area is similar to southern Atkinson County, characterized by numerous wetlands, bays, and swamps. There would likely be limited prime farmland soils or farmland of statewide importance soils in this area.

Georgia's climate is humid subtropical with mild winters and hot summers. With the project area located in the southern portion of the state and low in elevation, temperatures trend above the state average in this area. The duration of the growing season (frost-free period) is 240 days or greater. The average annual rainfall for the region is around 46 to 50 inches.

Figure 14 –Georgia Physiographic Regions

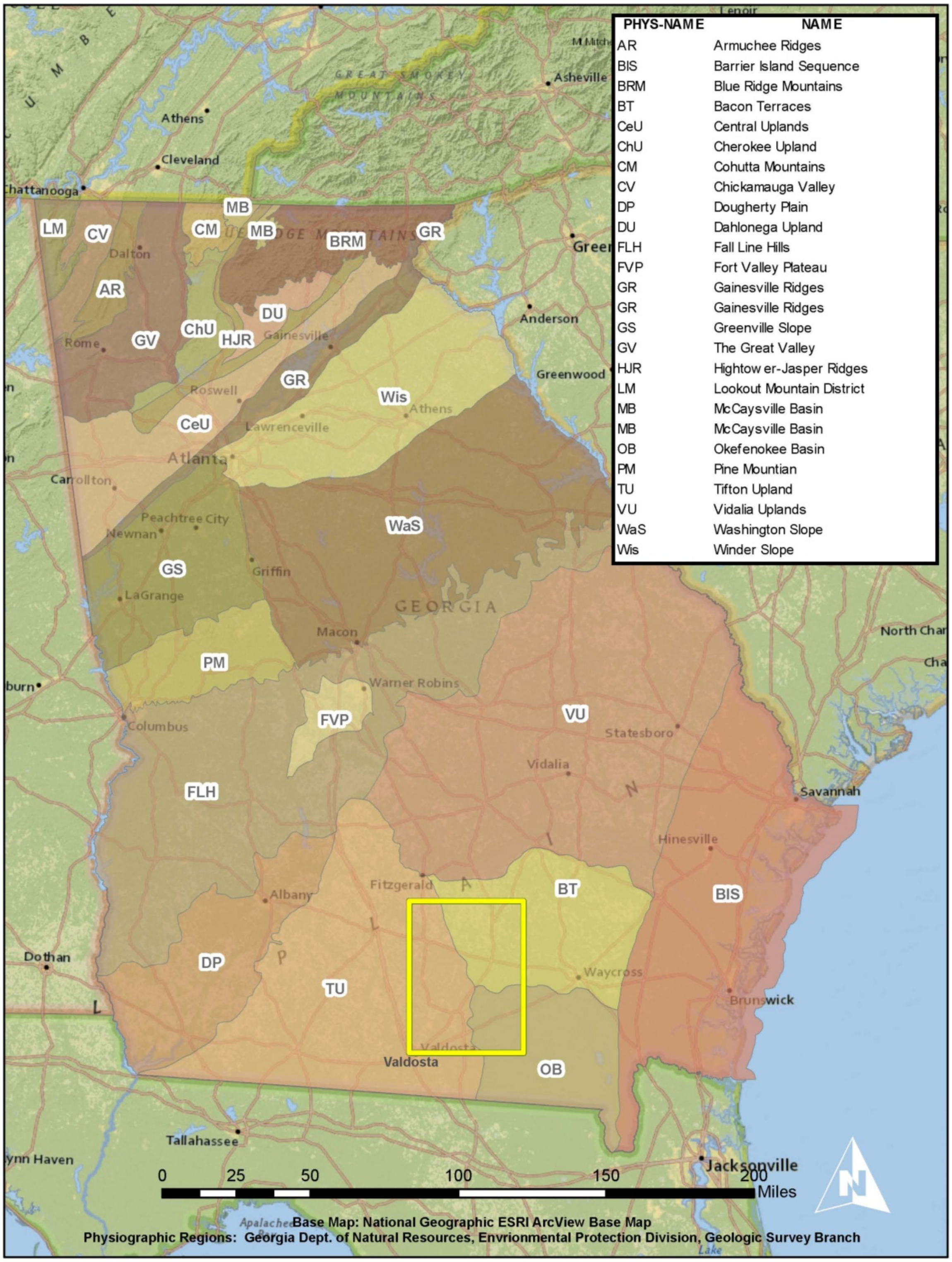


Figure 15 –Georgia Digital Elevation Model

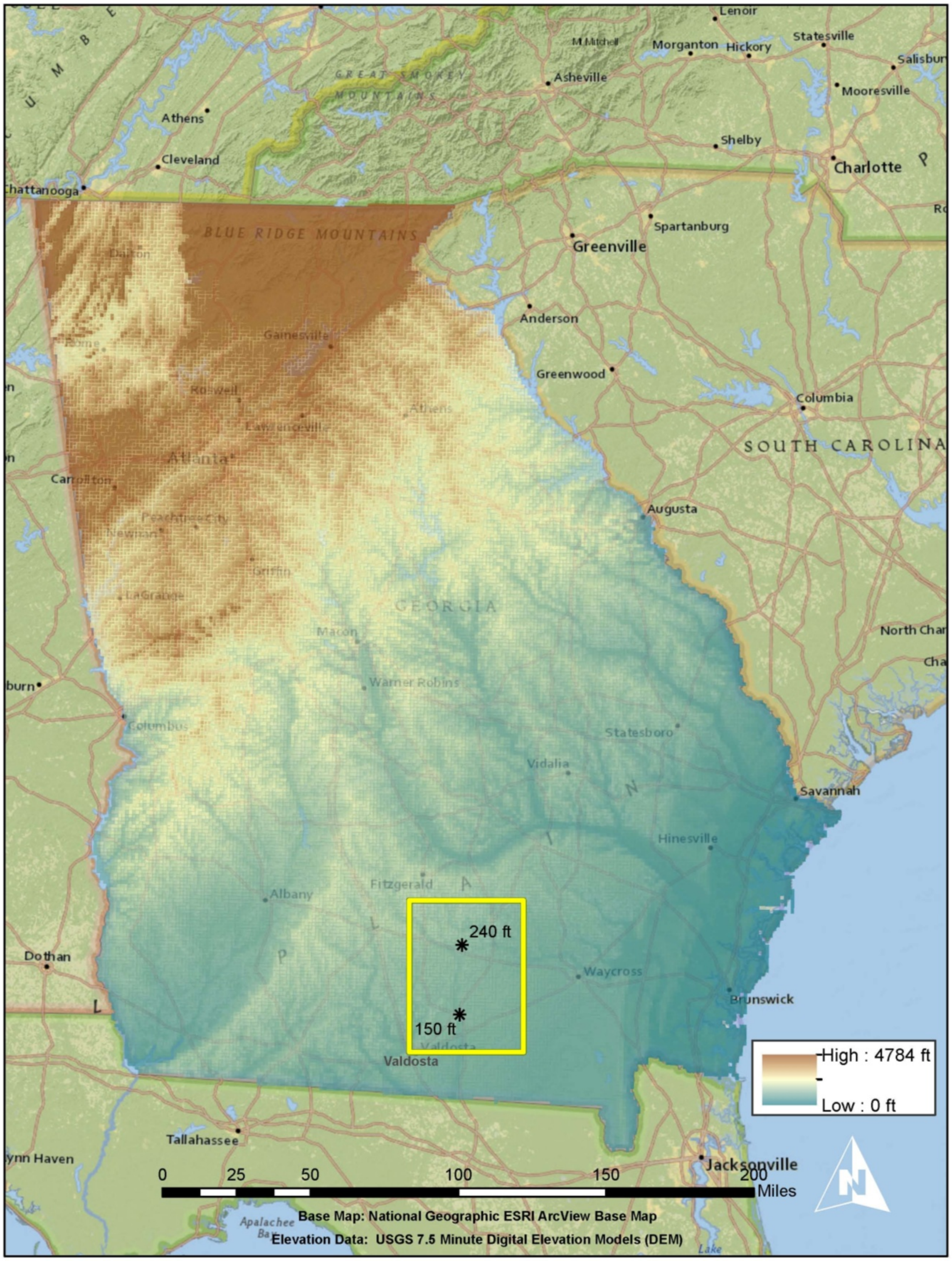
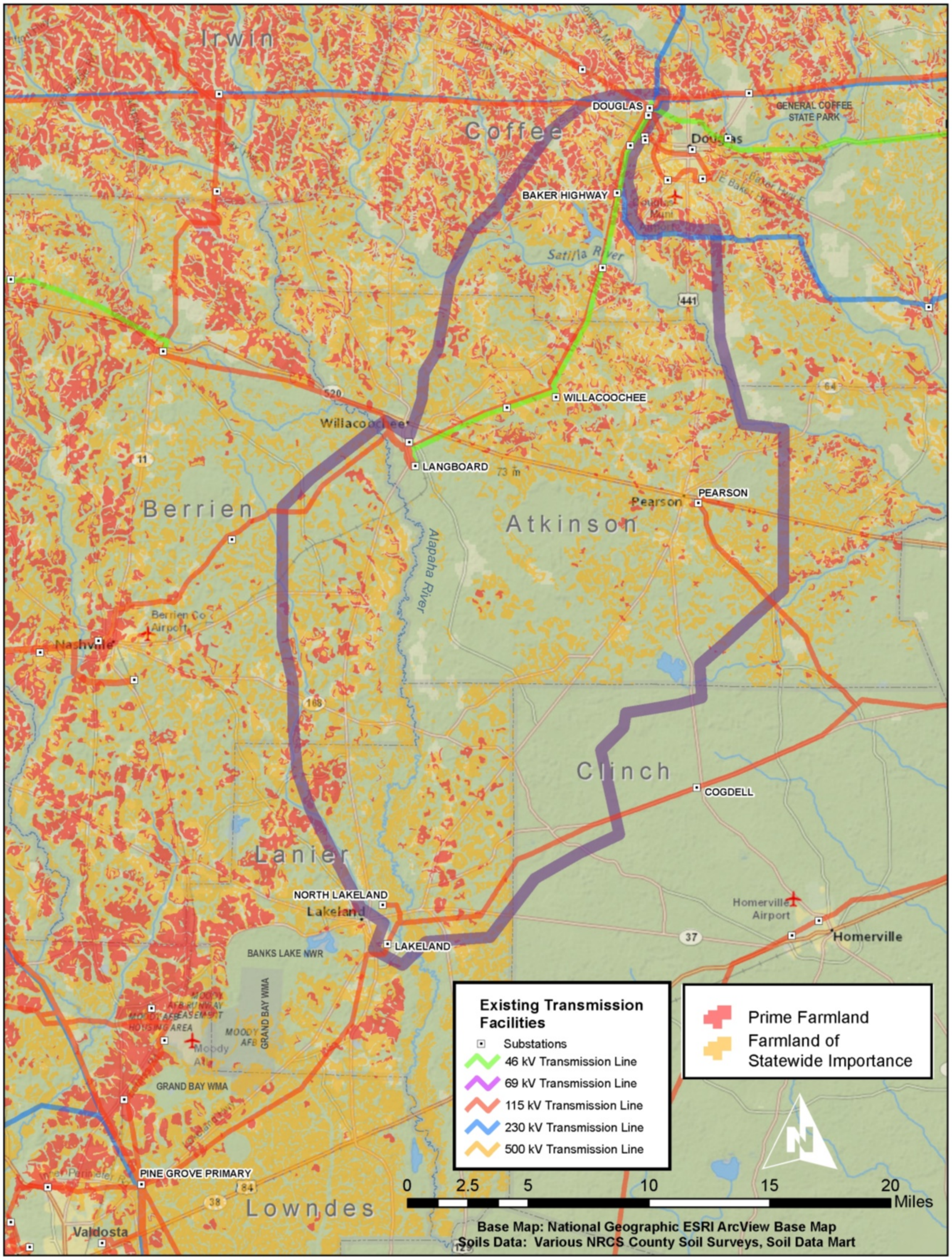


Figure 16 –Prime Farmland Soils



B. Land Use/Land Cover

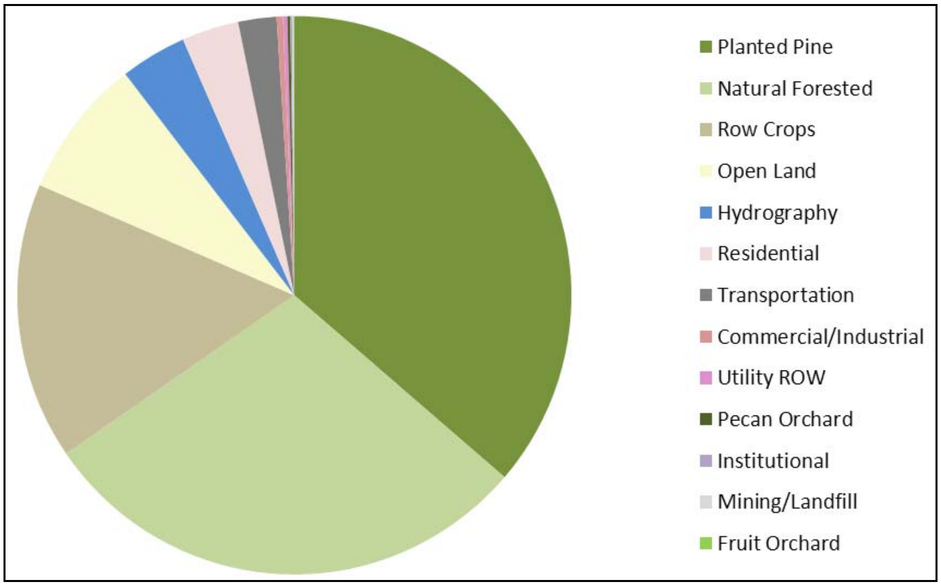
The study area for the proposed project consists primarily of pine plantations, naturally occurring forests, and cultivated areas. **Figure 17.** Approximately 65 percent of the area is forested. **Table 3.** The majority of forested lands occurs in the southern half of the study area and is associated with large wetlands south of US Highway 82. **Figure 18.** The cultivated areas occur in uplands throughout the study area. Primary crops include tobacco, corn, soybean, cotton, vegetables, blueberries, and peanuts. There is also an olive tree nursery located long US Highway 221 in the southern portion of the study area.

Urban areas are concentrated around the cities of Douglas, Willachoochee, Pearson, and Lakeland. The majority of industrial areas are concentrated in Douglas and Willachoochee. There is also rural residential development along State Route 135 in Berrien County, Old River Road in Lanier County, throughout southern Coffee County, and along transportation corridors in northern Atkinson County. Clinch and southern Aktinson Counties are the most undeveloped areas of the study area.

Table 3: Land Use / Land Cover Metrics for the Study Area

Land Use/Land Cover	Acres	Percent
Planted Pine	103743.0	36.3%
Natural Forest	83181.1	29.1%
Row Crops	45918.4	16.1%
Open Land	23148.5	8.1%
Wet Areas	11033.9	3.9%
Residential	9501.9	3.3%
Transportation	6383.4	2.2%
Commercial/Industrial	1055.0	0.4%
Utility Rights-of-Way	708.7	0.2%
Pecan Orchard	488.9	0.2%
Institutional (churches, schools, hospitals, etc…)	307.4	0.1%
Mining/Landfill	248.6	0.1%
Fruit Orchard	72.3	0.0%
Recreational	41.1	0.0%
TOTAL	285832.3	

Figure 17 –Study Area Land Use / Land Cover Pie Chart



56 churches and 33 cemeteries are located throughout the study area. Many are historic and several are eligible for listing the NRHP. These resources, along with schools and parks, have been documented within the project area using USGS 7.5 minute topographic quadrangles, tax assessor databases, and internet mapping tools. **Tables 4 & 5.**

A few schools in the Atkinson County School System are within the project area. **Table 5.** Other schools in the area fall outside the project boundary. Two colleges are in the City of Douglas, South Georgia College and Wiregrass Georgia Technical College. However, both fall outside the study area.

Two parks are with the study area. Pioneer Park is in the City of Willachoochee. Pearson Sports Complex and Civic Center is in the City of Pearson. **Table 6.**

No hospitals are located in the study area.

Figure 18 –Study Area Land Use / Land Cover Map

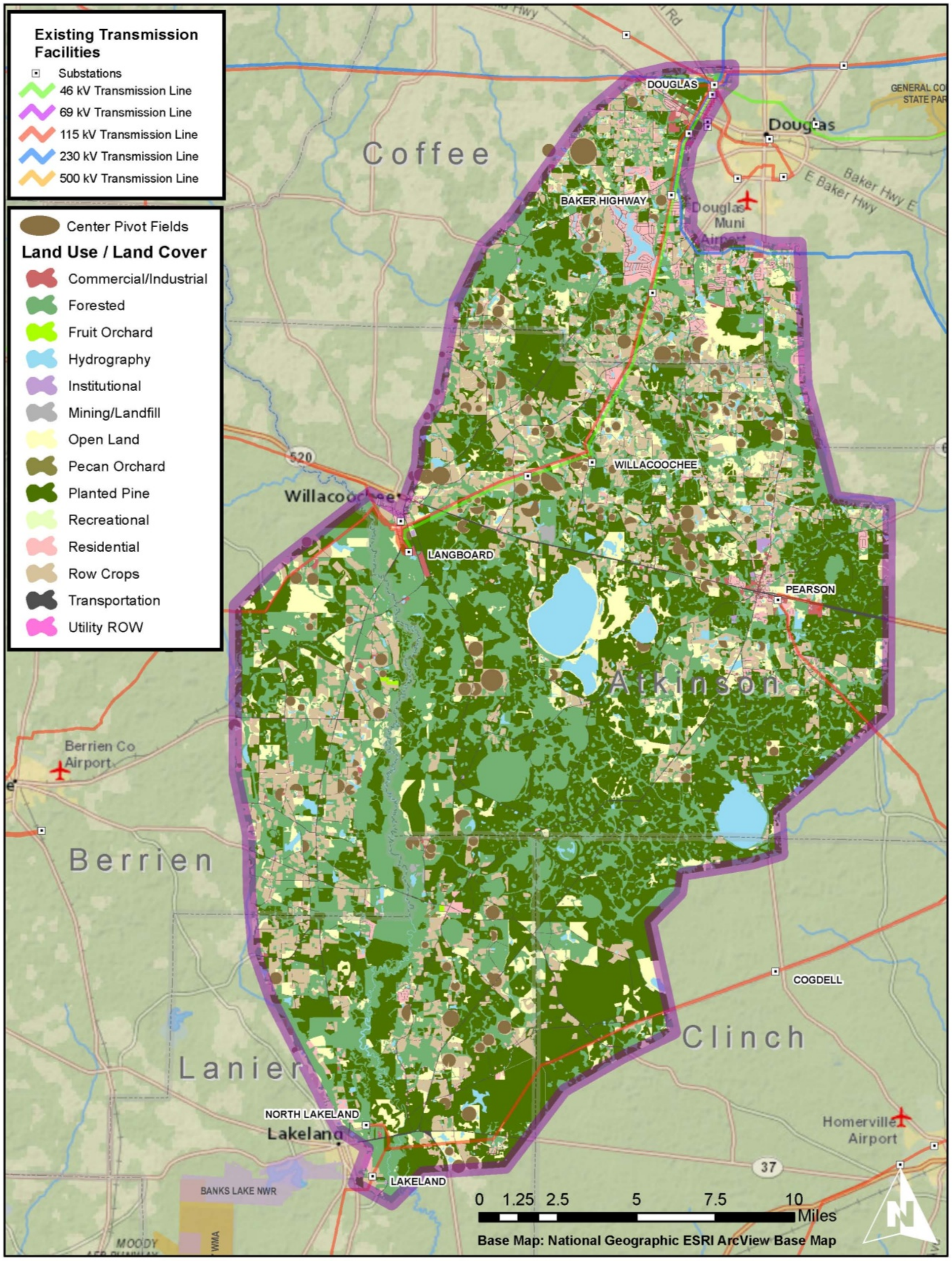


Table 4: Cemeteries within Study Area

Cemeteries	
Antioch Church Cemetery	Atkinson
Arnie Free Will Baptist Church Cemetery	Atkinson
Cross Roads Church Cemetery	Atkinson
Harmony Grove Church Cemetery	Atkinson
Holy Family Catholic Church Cemetery	Atkinson
Live Oak Church Cemetery	Atkinson
Mount Pleasant Baptist Church Cemetery	Atkinson
Refuge Church Cemetery	Atkinson
Springhead Church Cemetery	Atkinson
Sunnyside Church Cemetery	Atkinson
Sweetwater Methodist Church Cemetery	Atkinson
Union Hill Church Cemetery	Atkinson
Wesley Chapel Cemetery	Atkinson
Gaskins Graveyard	Berrien
Guthrie Church Cemetery	Berrien
Hendley Cemetery	Berrien
Poplar Springs Church Cemetery	Berrien
Poplar Springs Church Cemetery	Berrien
Camp Creek Baptist Church Cemetery	Clinch
Lang Memorial Baptist Church Cemetery	Clinch
Carver Baptist Church Cemetery	Coffee
Chaney Cemetery	Coffee
Daniel Cemetery	Coffee
Hebron Baptist Church Cemetery	Coffee
McClelland Cemetery	Coffee
Mora Baptist Church Cemetery	Coffee
Peterson Cemetery	Coffee
Pine Forests Memorial Gardens	Coffee
Saint Illa Cemetery	Coffee
Salem Cemetery	Coffee
Burnt Church Cemetery	Lanier
Fender Church Cemetery	Lanier
Mud Creek Church Cemetery	Lanier

Table 5: Churches within Study Area

Churches			
Antioch Church	Atkinson	The House Of God Holiness Church	Atkinson
Arnie Free Will Baptist	Atkinson	Tyson Church & Cemetery	Atkinson
Church Of God Of Prophecy	Atkinson	Union Hill Church	Atkinson
Church Of Jesus Christ	Atkinson	Union Holiness Church	Atkinson
Church Of Willacoochee	Atkinson	Wesley Chapel	Atkinson
Cohen's Temple Ministry	Atkinson	Bethel Holiness Church	Berrien
Cross Roads Church	Atkinson	Guthrie Church	Berrien
Faith Temple Pentecostal Church	Atkinson	Poplar Springs Church	Berrien
First Baptist Church	Atkinson	Riverside Church	Berrien
Harmony Grove Church	Atkinson	Trinity Holiness Baptist Church	Berrien
Holy Family Catholic Church	Atkinson	Camp Creek Baptist Church	Clinch
Kirkland Methodist Church	Atkinson	Lang Memorial Baptist Church	Clinch
Live Oak Church	Atkinson	Carver Baptist Church	Coffee
Mount Olive Baptist Church	Atkinson	First Community Church & Faith Christian Academy	Coffee
Mount Pleasant Baptist Church	Atkinson	Hebron Baptist Church	Coffee
New Bethel Church	Atkinson	Mora Baptist Church	Coffee
Oak Grove Baptist Church	Atkinson	Nancy Chapel Church	Coffee
Ozias Freewill Baptist Church	Atkinson	Salem Church	Coffee
Pearson Methodist Church	Atkinson	Senda De Vida Church	Coffee
Pine Chapel Missionary Baptist Church	Atkinson	St Illa Church	Coffee
Refuge Church	Atkinson	St Paul Catholic Church	Coffee
Salem Church	Atkinson	The Church Of Gods People	Coffee
Salem Church	Atkinson	Fender Church	Lanier
Springhead Church	Atkinson	First Born Church	Lanier
St James Methodist Church	Atkinson	Mud Creek Church	Lanier
Sunnyside Church	Atkinson	Oak Grove Church	Lanier
Sweetwater Methodist Church	Atkinson	Shiloh Baptist Church	Lanier
The First Born Church	Atkinson	Union Primary Baptist Church	Lanier

Table 6: Schools and Parks within Study Area

Schools/Parks	
Pioneer Park (Willachoochee)	Atkinson
City of Pearson Sports Complex and Civic Center	Atkinson
Atkinson County High School & Middle School	Atkinson
ISS Alter. School & Special Education Campus	Atkinson
Pearson Elementary School	Atkinson
Willacoochee Elementary School	Atkinson

C. Socioeconomic Data

Below are population statistics from the U.S. Census Bureau for the counties and cities within the study area. All counties and cities saw a population increase with the exception of Clinch County, Georgia and the City of Willachoochee. Both saw minor decreases in population from 2000 to 2010. The most notable population change is for Lanier County, Georgia and its county seat, the City of Lakeland. **Table 7.** Both saw much larger population growth rates than the other localities. This is most likely attributed to the proximity to Moody AFB.

Table 7: Population Changes for Counties and Cities

	2000	2010	% Change
Atkinson County	7,609	8,375	10%
Berrien County	16,235	19,286	19%
Clinch County	6,878	6,798	-1%
Coffee County	37,413	42,356	13%
Lanier County	7,241	10,078	39%
	2000	**2010**	**% Change**
Douglas	10,639	11,589	9%
Lakeland	2,730	3,366	23%
Pearson	1,805	2,117	17%
Willachoochee	1,434	1,391	-3%

GTC contracted with Linear Projects, Inc. to analyze the study area for potential Environmental Justice issues. Environmental Justice as defined by U.S. Environmental Protection Agency (USEPA) is "the fair treatment and meaningful involvement of all people regardless of race, color, sex, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations, and policies. Environmental justice considerations are applied to both low income and minority population areas". Linear Projects used 2010 Census data for U.S. Census Blocks in regards to minority populations and 2000 Census data (2010 data is currently unreleased) for U.S. Census Block Groups in regards to low income areas. Areas identified in **Figure 19** and **Figure 20** show areas that fall below the USEPA thresholds for both groups (i.e., >35.72% of the population are minorities and >17.58% of the population are classified as low income).

Areas under the USEPA's thresholds for minority populations are concentrated around the four cities: Douglas, Lakeland, Pearson, and Willachoochee. Areas under the USEPA's thresholds for low income are in Census Block Groups that contains the same four cities. In addition, the portion of Clinch County that falls within the study area is below the income threshold.

Figure 19 –Environmental Justice, Minority Populations

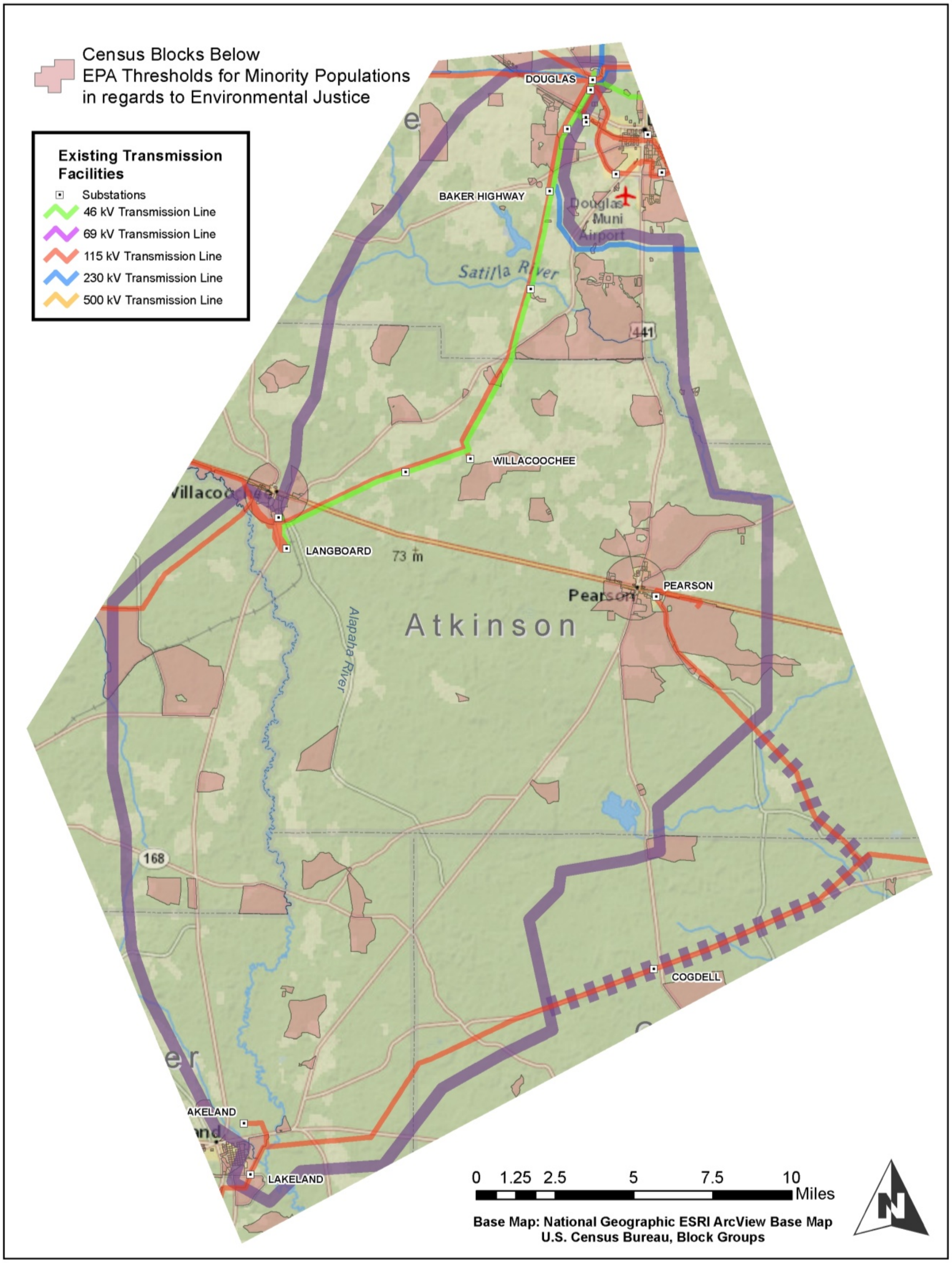
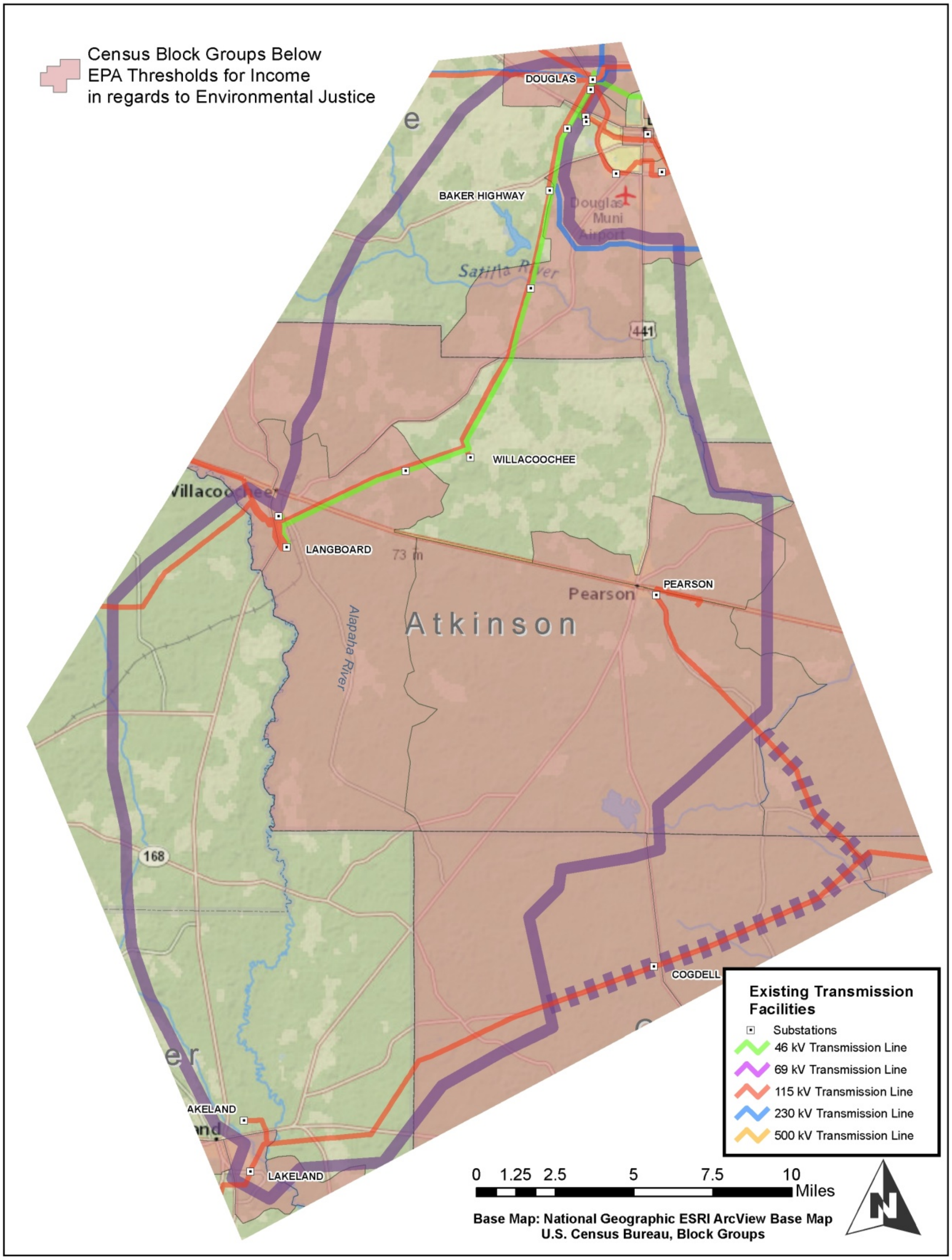


Figure 20 –Environmental Justice, Low Income



D. Transportation

The project area contains 4 US highways, 12 state routes, 3 active railways, 2 inactive railways, and numerous public county roads and private logging roads. These transportation corridors are evaluated as potential co-location opportunities.
Tables 8 & 9

Table 8: Highways that intersect Study Area

Highways	
US Hwy 441 / SR 89	Coffee, Atkinson, Clinch, Lanier
US Hwy 221 / SR 31	Coffee, Atkinson, Clinch
US Hwy 82 / SR 520	Atkinson
US Hwy 129	Lanier
State Route 206	Coffee
State Route 32	Coffee
State Route 158	Coffee
State Route 135	Coffee, Atkinson, Berrien, Lanier
State Route 64	Atkinson, Lanier
State Route 168	Berrien, Lanier, Clinch
State Route 122	Clinch, Lanier
State Route 37	Lanier
State Route 76	Berrien

Table 9: Railways that intersect Study Area

Railways		
CSX	Coffee	Active
Norfolk Southern	Coffee, Atkinson	Inactive
CSX - West of Pearson	Berrien, Atkinson	Inactive
CSX - East of Pearson	Atkinson	Active
Georgia & Florida Railnet	Berrien	Active

One private airstrip was located within the study area. The Douglas Municipal Airport is in close proximity. In addition, several other airports in the region are listed below. **Table 10.**

Table 10: Area Airports

Airports		
Douglas Municipal	Coffee	0.25 miles from study area
Homerville	Clinch	7.25 miles from study area
Moody Air Force Base	Lowndes	6.5 miles from study area
Berrien County	Berrien	5 miles from study area
South One Ten	Berrien	6 miles from study area
Private Airstrip (SR 76)	Berrien	Within study area

E. Water Resources

The project area contains two river corridors, the Alapaha River on the western edge and the Satilla to the north. Pudding Creek (a tributary to the Satilla) is also a notable waterway in the project area. **Table 11.** The streams in southeastern portion of the study area drain to the Suwannee River. In addition to wetland areas occurring alongside the rivers and streams, extensive wetlands, bays, and ponds also are present in the project area. These are located south of US Highway 82 and north of the City of Lakeland. **Table 12. Figure 21.**

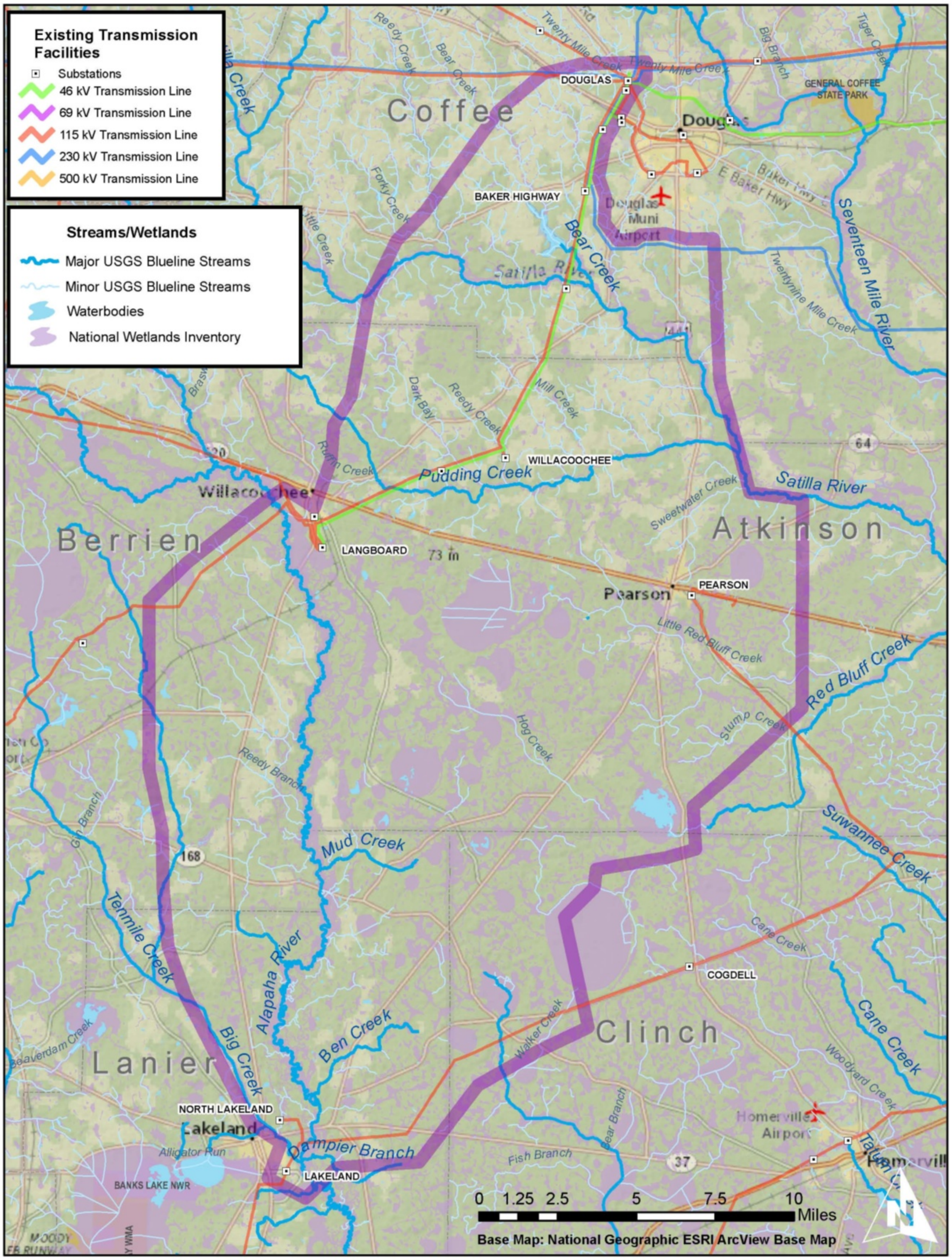
Table 11: Streams/Rivers within Study Area

Streams/Rivers	
Alapaha River	Little Red Bluff Creek
Bear Creek	Mill Creek
Ben Creek	Mud Creek
Big Creek	Pudding Creek
Camp Creek	Red Bluff Creek
Cross Creek	Reedy Branch
Dampier Branch	Reed Creek
Dark Bay	Ruffin Creek
Darsey Mill Branch	Stump Creek
Fivemile Creek	Sweetwater Creek
Forky Creek	Satilla River
Hog Creek	Twenty Mile Creek
Indian Creek	Walker Creek

Table 12: Waterbodies within Study Area

Lakes/Ponds/Swamps	
Arabia Swamp	Howell Lake
Bee Pond Flats	Kirkland Mill Pond
Butchers Pond	Long Bay
Camp Bay	Mullis Bay
Devils Bay	Old Ninety Bay
Featherbed Bay	Pattens Bay
Gaskins Lake	Pee Dee Bay
Griner Pond	Ricketson Bay
Guest Mill Pond	Round Lake
Half Moon Lake	Roundabout Swamp
Haskin Lake	Smith Pond
Hastings Fish Pond	Steve Bay
Hilliards Pond	Stewart Lake
Hog Creek Bay	Still Bay
Holiday Beach Lake	Vickers Lake
Holiday Beach North Lake	Wolf Bay

Figure 21 –Water Resources



F. Floodplains

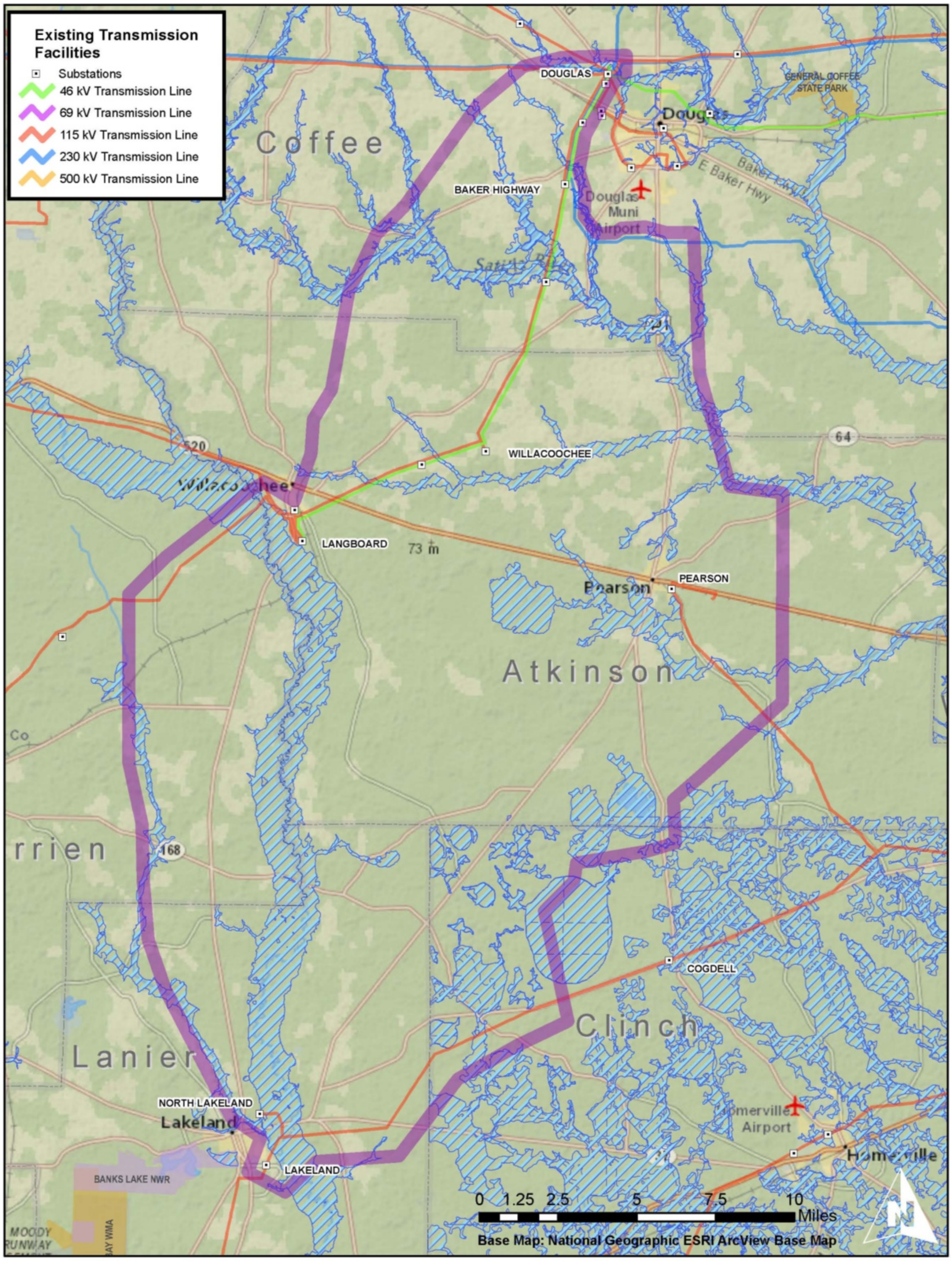
Federal Emergency Management Agency (FEMA) mapped floodplain areas are located along the major river and stream corridors in the study area. **Table 13.**

Table 13: Streams/Rivers with Floodplains

Streams/Rivers with FEMA Floodplain
Alapaha River
Bear Creek
Big Creek
Pudding Creek
Red Bluff Creek
Dampier Branch
Dark Bay
Forky Creek
Little Red Bluff Creek
Mill Creek
Mud Creek
Stump Creek
Sweetwater Creek
Satilla River

In addition, there is an extensive floodplain area located in Clinch County. These FEMA mapped floodplains area associated with the large wetlands, swamps, and bays in the area. **Figure 22.**

Figure 22 –FEMA Floodplains



G. Cultural Resources

The study area contains one structure listed in the NRHP, the Atkinson County Courthouse. The University of Georgia (UGA) Find IT! program surveyed Atkinson County for architectural structures and buildings eligible for listing in the NRHP during the Spring of 2012. Two districts were identified within the county, the central business districts of the cities of Willachoochee and Pearson. In addition, 35 resources were identified with the study area. **Table 14. Figure 23.**

For the remaining portions of the study area outside of Atkinson County, GTC contracted with New South Associates, Inc. to conduct architectural structure and district surveys for resources eligible for listing in the NRHP during the Spring of 2012. The survey included portions of Berrien, Clinch, Coffee, and Lanier Counties.

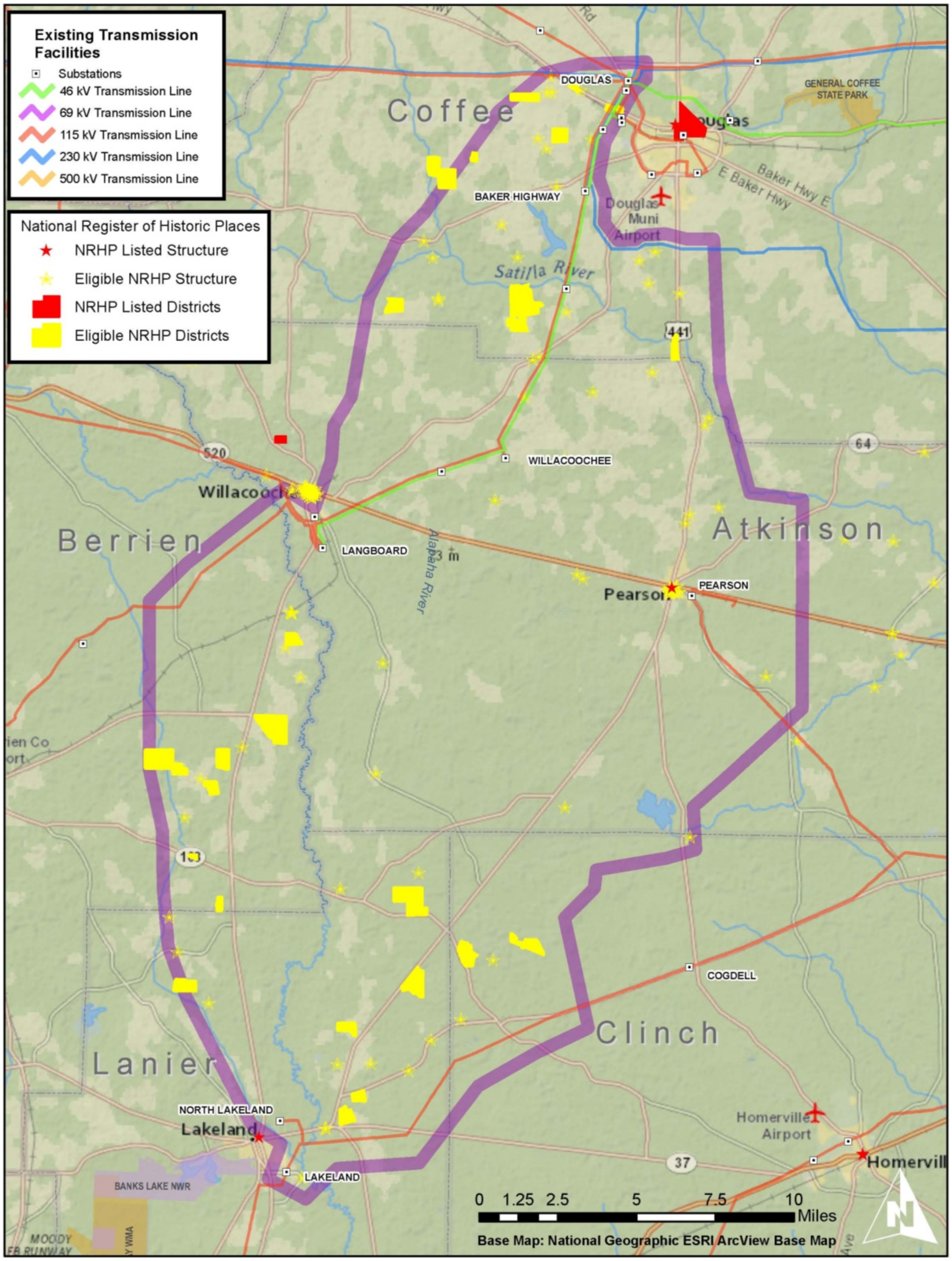
Their findings included:.

Table 14: Eligible NRHP Resources

	Eligible NRHP Districts	Eligible NRHP Structures
Berrien County (New South)	8	6
Clinch County (New South)	3	3
Coffee County (New South)	10	15
Lanier County (New South)	7	13
Atkinson County (Find It!)	2	35
Total Resources in Study Area	**30**	**72**

GTC contracted with Southeastern Archeological Services (SAS) to research the state archeological site files for sites occurring with the study area. No archeological sites listed on the NRHP were recorded. There is some potential for archeological resources to be located along the Alapaha and Satilla River corridors.

Figure 23 –Cultural Resources



H. Recreation Resources

In the study area, there are recreational facilities within the cities of Pearson and Willachoochee. Recreation facilities associated with the cities of Douglas and Lakeland fall outside the boundaries of the study area. General Coffee State Park is the closest state park, approx. 4.5 miles northeast of the study area. Grand Bay WMA is located 4.5 miles to the southwest of the study area. Banks Lake NWR is located less than one mile from the termination area of the project. The area's water resources and private hunting clubs provide additional recreation opportunities.

I. Formally Classified Lands

No Wild and Scenic Rivers, National Forests, or State and National Parks are located within the study area boundary. Formally classified lands in close proximity are listed in **Table 15**.

Table 15: Area Formally Classified Lands

Public Lands		
General Coffee State Park	Coffee	4.5 miles from study area
Banks Lake National Wildlife Refuge	Lanier	0.3 miles from study area
Moody Air Force Base	Lanier, Lowndes	6.5 miles from study area
Grand Bay Wildlife Management Area	Lanier, Lowndes	4.5 miles from study area

General Coffee State Park

General Coffee State Park is located east of Douglas, Georgia in Coffee County. It is a 1,511-acre park with equestrian/hiking trails and a boardwalk through swamps and bottomland hardwoods along Seventeen-Mile River. The park is home to a population of Gopher tortoises. It contains a heritage farm that illustrates the area's agricultural history.

Banks Lake National Wildlife Refuge

Banks Lake NWR is located near Lakeland, Georgia in Lanier County. The refuge is 4,049 acres of marsh, cypress swamp, and open water. It is administered by the Okefenokee NWR, approximately 45 miles to the east. It provides fishing, boating, and wildlife viewing recreational activities. Approximately 2000 sandhill cranes winter at the refuge.

Moody Air Force Base

Moody AFB is located in Lowndes and Lanier Counties, Georgia, approximately 9 miles northeast of Valdosta, Georgia. The base is home to the 23d Wing and the 93d Air Ground Operations Wing. Moody AFB has an economic impact on the surrounding community, contributing almost $450 million dollars to the local economy. The primary aircraft at the base are the A-10 Thunderbolt II, HC-130P Combat King, and the HH-60G Pave Hawk.

Grand Bay Wildlife Management Area

The Grand Bay WMA is a large tract of land adjacent to the Moody AFB and the Banks Lank NWR. It contains several Carolina Bays, which offers excellent habitat for a diverse group of wildlife. In addition to providing a hunting recreational resource, the WMA contains the Grand Bay Wetland Education Center.

A partnership between the Georgia Department of Natural Resources (GADNR), Ducks Unlimited, Moody AFB, and local landowners allows for the ongoing restoration and maintenance of this wetland system. This has enabled Grand Bay to become a regional nesting site for wood ducks. Grand Bay also serves as the winter home of migratory Sandhill cranes.

J. Sensitive Wildlife Resources

There are 7 federally listed species and 27 state listed species that may occur in the study area. GADNR, Wildlife Resource Division and the United States Fish and Wildlife Service (USFWS) websites were reference to create the tables shown below of species that may occur within the project area by county. **Tables 16 & 17.** No USFWS listed Critical Habitats are located within or in close proximity to the study area.

Table 16: Federally Listed Species

Atkinson County		
Bird	Wood stork (*Mycteria americana*)	Endangered
Reptile	Eastern indigo snake (*Drymarchon corais couperi*)	Threatened
Reptile	Gopher tortoise (*Gopherus polyphemus*)	Candidate
Berrien County		
Bird	Wood stork (*Mycteria americana*)	Endangered
Amphibian	Frosted Flatwoods salamander (*Ambystoma ingulatum*)	Threatened
Reptile	Eastern indigo snake (*Drymarchon corais couperi*)	Threatened
Reptile	Gopher tortoise (*Gopherus polyphemus*)	Candidate
Clinch County		
Bird	Wood stork (*Mycteria americana*)	Endangered
Reptile	Eastern indigo snake (*Drymarchon corais couperi*)	Threatened
Bird	Red-cockaded Woodpecker (*Picoides borealis*)	Endangered
Coffee County		
Bird	Wood stork (*Mycteria americana*)	Endangered
Clam	Altamaha Spinymussel (*Elliptio spinosa*)	Endangered
Reptile	Eastern indigo snake (*Drymarchon corais couper*i)	Threatened
Reptile	Gopher tortoise (*Gopherus polyphemus*)	Candidate
Lanier County		
Amphibian	Frosted Flatwoods salamander (*Ambystoma ingulatum*)	Threatened
Amphibian	Striped newt (*Notophthalmus perstriatus*)	Candidate
Bird	Wood stork (*Mycteria americana*)	Endangered
Reptile	Eastern indigo snake (*Drymarchon corais couperi*)	Threatened
Reptile	Gopher tortoise (*Gopherus polyphemu*s)	Candidate

Table 17: State Listed Species

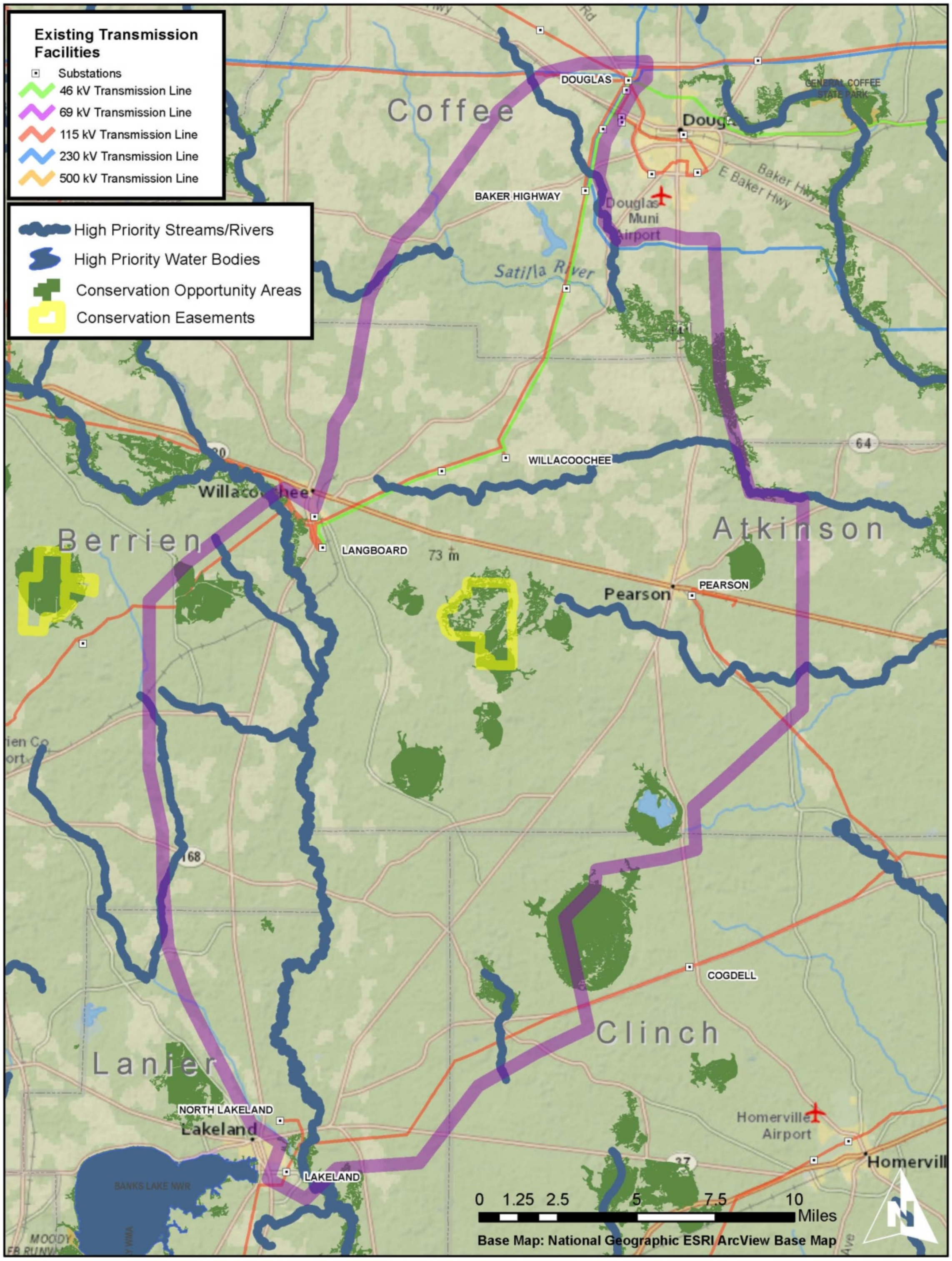
Atkinson County	
Plant	Georgia Plume (*Elliottia racemosa*)
Plant	Yellow Flytrap (*Sarracenia flava*)
Plant	Hooded Pitcherplant (*Sarracenia minor var. minor*)
Berrien County	
Bird	Bachman's Sparrow (*Aimophila aestivalis*)
Reptile	Spotted Turtle (*Clemmys guttata*)
Fish	Blackbanded Sunfish (*Enneacanthus chaetodon*)
Bird	Bald Eagle (*Haliaeetus leucocephalus*)
Amphibian	Striped Newt (*Notophthalmus perstriatus*)
Amphibian	Gopher Frog (*Rana capito*)
Plant	Purple Honeycomb Head (*Balduina atropurpurea*)
Plant	Carolina Bogmint (*Macbridea caroliniana*)
Plant	Lax Water-milfoil (*Myriophyllum laxum*)
Plant	Crestless Plume Orchid (*Pteroglossaspis ecristata*)
Plant	Yellow Flytrap (*Sarracenia flava*)
Plant	Parrot Pitcherplant (*Sarracenia psittacina*)
Plant	Silky Camellia (*Stewartia malacodendron*)
Clinch County	
Reptile	Spotted Turtle (*Clemmys guttata*)
Mammal	Rafinesque's Big-eared Bat (*Corynorhinus rafinesquii*)
Bird	Swallow-tailed Kite (*Elanoides forficatus*)
Plant	Lax Water-milfoil (*Myriophyllum laxum*)
Plant	Yellow Flytrap (*Sarracenia flava*)
Plant	Hooded Pitcherplant (*Sarracenia minor var. minor*)
Plant	Parrot Pitcherplant (*Sarracenia psittacina*)
Coffee County	
Clan	Altamaha Arcmussel (*Alasmidonta arcula*)
Reptile	Spotted Turtle (*Clemmys guttata*)
Insect	Say's Spiketail (*Cordulegaster sayi*)
Bird	Bald Eagle (*Haliaeetus leucocephalus*)
Reptile	Southern Hognose Snake (*Heterodon simus*)
Reptile	Mimic Glass Lizard (*Ophisaurus mimicus*)
Plant	Purple Honeycomb Head (*Balduina atropurpurea*)
Plant	Georgia Plume (*Elliottia racemosa*)
Plant	Greenfly Orchid (*Epidendrum magnoliae*)
Plant	Pond Spice (*Litsea aestivalis*)
Plant	Pineland Barbara Buttons (*Marshallia ramosa*)
Plant	Cutleaf Beardtongue (*Penstemon dissectus*)
Plant	Yellow Flytrap (*Sarracenia flava*)

Plant	Hooded Pitcherplant (*Sarracenia minor var. minor*)
Plant	Parrot Pitcherplant (*Sarracenia psittacina*)
Lanier County	
Bird	Bachman's Sparrow (*Aimophila aestivalis*)
Fish	Spotted Bullhead (*Ameiurus serracanthus*)
Reptile	Spotted Turtle (*Clemmys guttata*)
Bird	Bald Eagle (*Haliaeetus leucocephalus*)
Reptile	Alligator Snapping Turtle (*Macrochelys temminckii*)
Amphibian	Striped Newt (*Notophthalmus perstriatus*)
Plant	Greenfly Orchid (*Epidendrum magnoliae*)
Plant	Yellow Flytrap (*Sarracenia flava*)
Plant	Hooded Pitcherplant (*Sarracenia minor var. minor*)
Plant	Parrot Pitcherplant (*Sarracenia psittacina*)

Figure 24 shows data from the Conservation Opportunity Areas study mapped by UGA Natural Resources Spatial Analysis Laboratory in Athens, Georgia (http://georgiawildlife.com/node/1378) and High Priority Waters (http://www.georgiawildlife.com/node/1377), both indicators of high biodiversity.

In addition, public lands and lands containing conservations easement may also provide valuable habitat for plants and wildlife. There are no federal and state lands within the study area. However, one large tract was identified in Atkinson County south of the community of Kirkland as a conservation easement through the Natural Resources Conservation Service (NRCS) database distributed by the Georgia GIS Clearinghouse. This tract of land as well as Conservation Opportunity Areas and High Priority Waters are located on **Figure 24**.

Figure 24 – Wildlife Resources



VI. Corridor Analysis

Using the next step in the EPRI-GTC Methodology, GTC evaluated Phase Two Corridors (also known as Alternate Corridors) between the project end points. The northern end point is the existing Douglas Substation and the southern end point is an area along the existing Pine Grove – Kettle Creek and North Lakeland Tap 115 kV Transmission Lines near the Lakeland and North Lakeland Substation. The southern end point connects to the termination area for GPC's proposed transmission line project, Pine Grove Primary – Lakeland 230 kV Transmission Line.

GTC and their consultants performed research, data collection, analysis, mapping, and statistical evaluations. The data was organized in to map layers. Each map layer contains features. For example, the Streams and Wetlands Map Layer contains the following features:

- Streams (water flow < 5 cubic feet per second (cfs))
- Rivers/Streams (water flow > 5 cfs)
- Trout Streams
- Salt Marsh
- Forested Wetlands
- Non-forested Wetlands

Map layers and the map features associated with each layer were determined by past transmission line siting experience and from input provided by stakeholders. Stakeholders were convened during workshops held in 2003. These stakeholders included members of the Georgia electrical utility industry, federal, state, and local agencies, and non-government organizations. Stakeholders were divided into three groups (known as perspectives) based on their expertise: **Figure 25.**

- The Built Environment – focusing on community issues
- The Natural Environment – focusing on natural resources and including environmental regulatory issues
- Engineering Requirements – focusing on co-location with existing linear infrastructure as well as engineering constraints

Likewise, the map layers were organized into these three perspectives.

In addition to map layers and features, stakeholders also helped develop a list of Areas of Least Preference. These features are modeled so that the Phase Two Corridors that are generated will not include these areas. Features are identified as Least Preference due to engineering constraints, regulatory issues, or cultural significance.

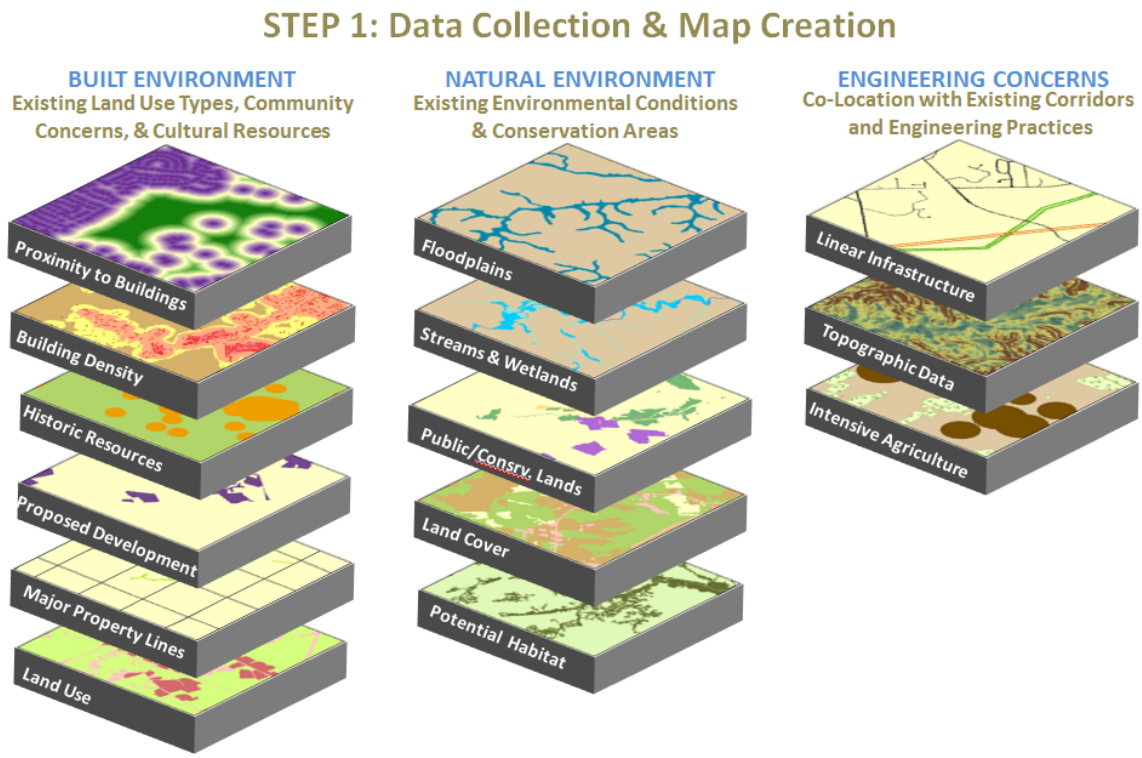
Included in the list are the original datasets incorporated at the Phase One Corridor analysis or description of the project area.

- Listed Archaeology Sites
- Listed NRHP Districts and Buildings
- Airports/Airstrips
- USEPA Superfund Sites
- Non-Spannable Waterbodies
- State and National Parks
- Military Facilities
- Mines, Quarries, Landfills
- USFS Wilderness Area
- Wild/Scenic Rivers
- National Wildlife Refuge

In addition, the following features are included for the more data extensive Phase Two Corridor analysis.

- Eligible NRHP Districts
- City and County Parks
- Day Care Parcels
- Cemetery Parcels
- School Parcels (K-12)
- Church Parcels
- Areas of Ritual Importance
- Buildings

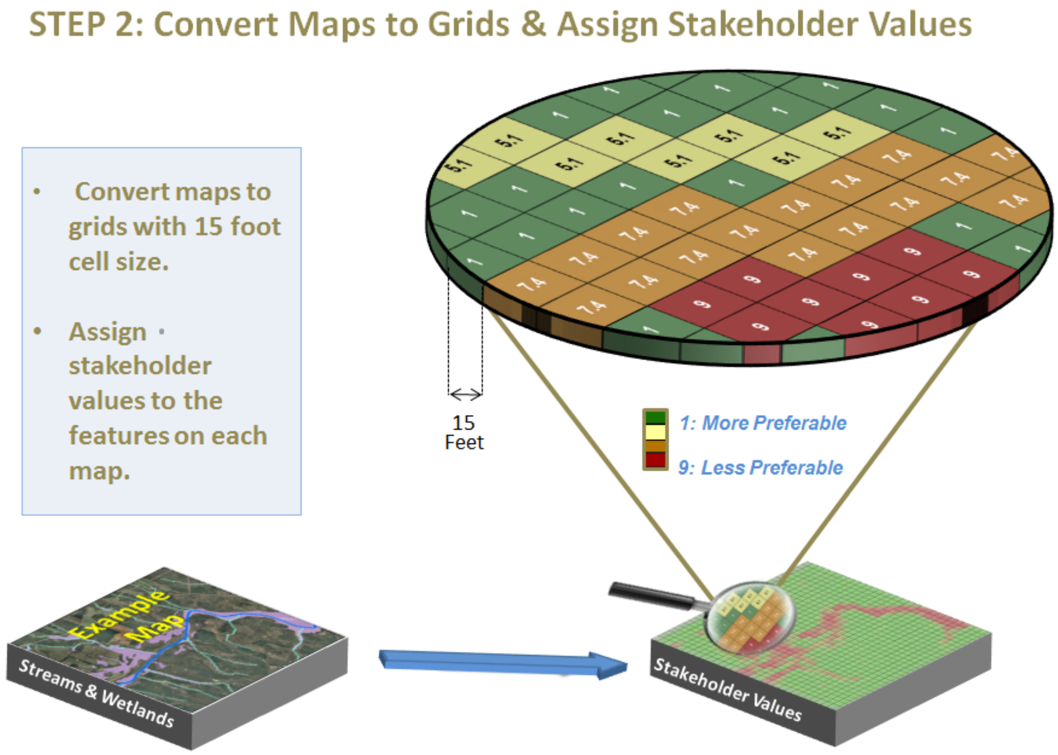
Figure 25–Map Layer Illustration



In addition to defining the EPRI-GTC Methodology's data, stakeholders were asked to assign values to each feature. Features within each layer were assigned a numerical preference ranging from 1 to 9. Areas of higher preference for transmission lines are assigned lower numbers than less preferable areas, 1 being the most suitable and 9 being the least suitable for the features within a map layer. Stakeholders used a modified Delphi Process to reach a reasonable level of consensus. **Figure 26**.

As with the data for the Phase One corridors discussed in Section IV of this report, datasets are converted to raster data or grids. Grids are divided into cells across the study area. Each cell of the suitability map is assigned the stakeholder based value. The scale of the cells for this phase of the methodology is 15 square feet.

Figure 26–Stakeholder Value Illustration



Stakeholders were asked to develop weights for each of the map layers based on importance to transmission line location. The Analytical Hierarchy Process (AHP) was used to develop these weights. AHP is a structured method that uses pairwise comparisons to derive priorities that ultimately leads to a decision. In each perspective, map layers were compared to each other by the stakeholders by assigning a value of importance. The values were gathered and entered in to an AHP computer program. The software calculated the weights as percentages. **Table 22.**

To create overall suitability models, the stakeholder weighs are applied to the map layers and combined into one composite surface for each perspective. Once combined, the suitability surfaces for each perspective are combined along with the Areas of Least Preference to create four models. These generate the four alternative corridors towards the end of this section of the report. **Figure 27.**

Engineering Alternative Corridor Model =
((Engineering Surface × 5) + Natural Env. Surface + Built Env. Surface) ÷ 7

Natural Environment Alternative Corridor Model =
(Engineering Surface + (Natural Env. Surface × 5)+ Built Env. Surface) ÷ 7

Built Environment Alternatie Corridor Model =
(Engineering Surface + Natural Env. Surface + (Built Env. Surface × 5)) ÷ 7

Simple Average Corridor Model =
(Engineering Surface + Natural Env. Surface + Built Env. Surface) ÷ 3

Figure 27–Suitability Model Illustration

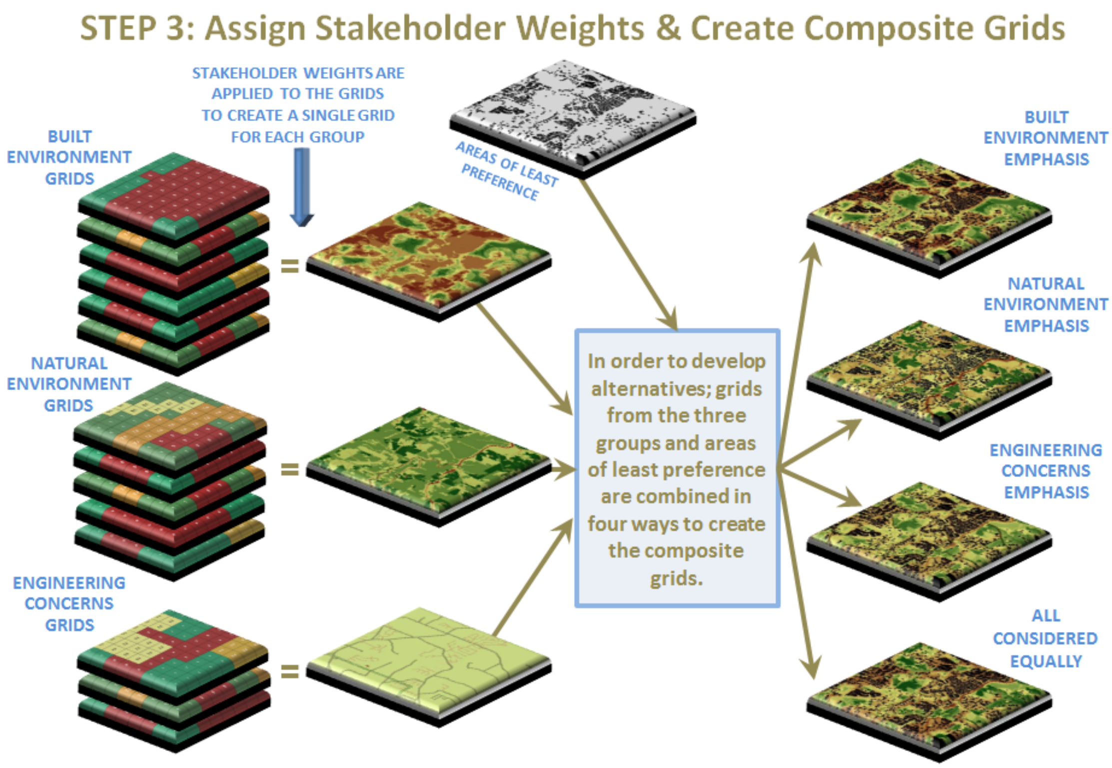
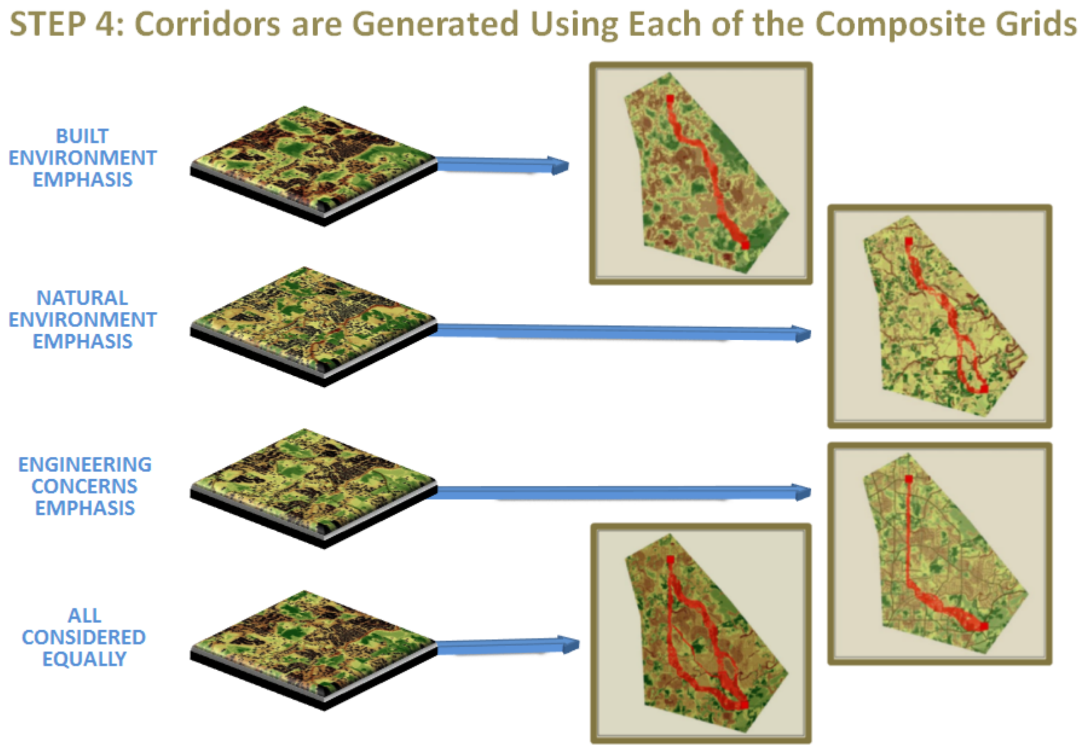


Figure 28–Corridor Generation Illustration



The information depicted in this illustration is only for demonstration and not specific to the subject project.

Once values are assigned, the same routing algorithm for the Phase One Corridors is applied across the suitability surfaces to produce the Phase Two Corridors. **Figure 28**.

1. Engineering Perspective Data

Although all data collected for the Siting Methodology is utilized in each perspective, the values for the map layers and features listed below are emphasized five times greater than the weights and values of the other two perspectives. By emphasizing the following datasets in **Table 18**, a distinct alternative is developed. Typically, the corridor produced by this perspective seeks out existing linear corridors that have connectivity to the termination points of the project.

Table 18: Engineering Stakeholder Weights and Values

Engineering	
Linear Infrastructure	**53.1%**
Rebuild Existing Transmission Lines	1
Parallel Existing Transmission Lines	1.4
Parallel Roads ROW	3.8
Parallel Gas Pipelines	N/A
Parallel Railway ROW	5.3
Background	5.9
Future GDOT Plans	N/A
Parallel Interstates ROW	Not Present
Transportation Right of Way	9
Scenic Highways ROW	Not Present
Slope	**N/A**
Slope 0-15%	N/A
Slope 15-30%	Not Present
Slope >30%	Not Present
Intensive Agriculture	**46.9%**
Background	1
Fruit Orchards	5
Pecan Orchards	9
Center Pivot Agriculture	9

A. Linear Infrastructure

Some transmission lines are suitable for rebuilding or paralleling due to their location in the project area, the availability to take an outage on the facility, and reliability issues. **Table 19.**

Table 19: Existing Transmission Line that intersect the Study Areas

Electric Transmission Lines			
Douglas - Wilsonville 230 kV	Georgia Transmission Corp.	Coffee	Rebuild Opportunity
Douglas - Baker Highway 115 kV	Georgia Transmission Corp.	Coffee	Rebuild Opportunity
Baker Highway - Langboard 115 kV	Georgia Transmission Corp.	Coffee, Atkinson	Rebuild Opportunity
Douglas – Heritage Hills 46 kV	Georgia Power Company	Coffee, Atkinson	
Langboard – Quinton Dillingham 46 kV	Georgia Power Company	Atkinson	
Douglas – Douglas#2 115kV	Municipal Electric Authority of GA	Coffee	
Douglas – Stump Creek 230 kV	Municipal Electric Authority of GA	Coffee	
Douglas – Stump Creek 115 kV	Georgia Power Company	Coffee	
Langboard – Nashville #1 115 kV	Georgia Transmission Corp.	Atkinson, Berrien	
Kettle Creek Primary. – Pine Grove Primary 115 kV	Georgia Power Company	Atkinson, Clinch, Lanier	Rebuild Opportunity
North Lakeland Tap 115 kV	Georgia Transmission Corp.	Lanier	Rebuild Opportunity
Kettle Creek Primary – Pine Grove Primary 115 kV (Tap to Pearson)	Georgia Power Company	Atkinson, Clinch	Rebuild Opportunity

All public roads and highways are modeled as opportunities in this perspective. **Table 8.**

Railways are modeled as a moderate opportunity to parallel in this perspective. There are four railways in the project area. **Table 9.**

Although there is one pipeline in the project area, it is north of the northern termination point, Douglas Substation. In addition, the pipeline runs east to west. Therefore, the pipeline was not modeled as a parallel opportunity.

Within the project area, background is the absence of linear infrastructure. These locations are commonly called cross-country areas. Features receiving a value lower (more suitable) than background are considered an opportunity for potential corridors. Values higher (less suitable) than background are considered a constraint for potential corridors.

Although there are some proposed Georgia Department of Transportation (GDOT) projects for highways in the project area, it is not clear at this time if they pose a restriction on transmission line corridor development. Therefore, this feature was not included in the model as a feature of low suitability.

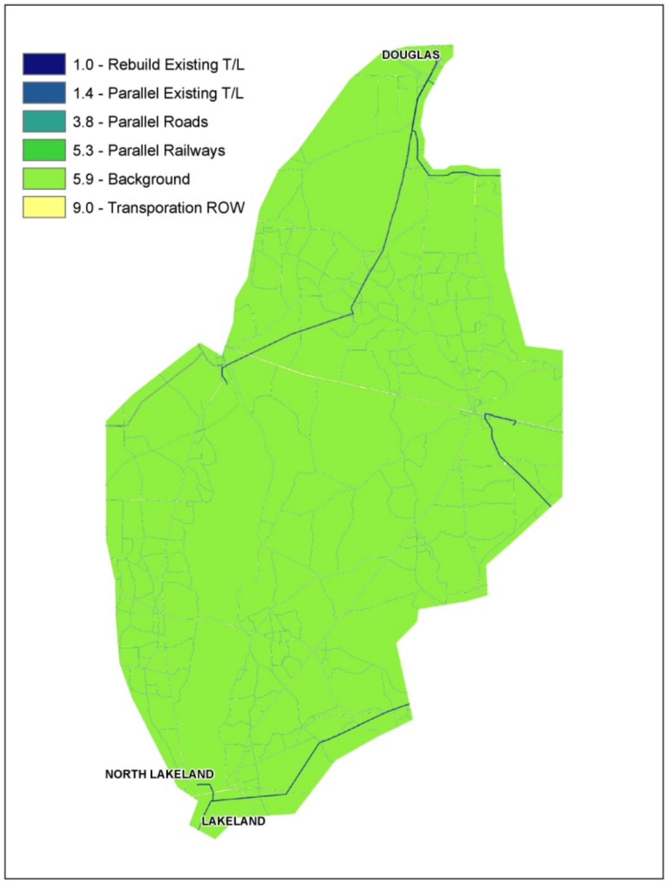
Although interstate highways are existing corridors, their limited access status restricts accessibility to potential corridors for construction and maintenance of a paralleling utility. This feature is modeled as less suitable as compared with road and highways with no access restrictions. There are no interstate highways in the project area.

Transportation rights-of-way are modeled as a constraint. In most instances, the center of the roads are absent of other constraints such as buildings or wetlands. However, it is not feasible to locate a transmission line corridor down the center of a road. Therefore, the road and railway rights-of-way are modeled as low suitability.

Designated scenic highways are modeled as less suitable. There are no designated scenic highways in the project area.

Features in this map layer receive 53.1% of the overall value in the Engineering Perspective. **Figure 29.**

Figure 29 –Linear Infrastructure Map Layer



B. Slope (Terrain)

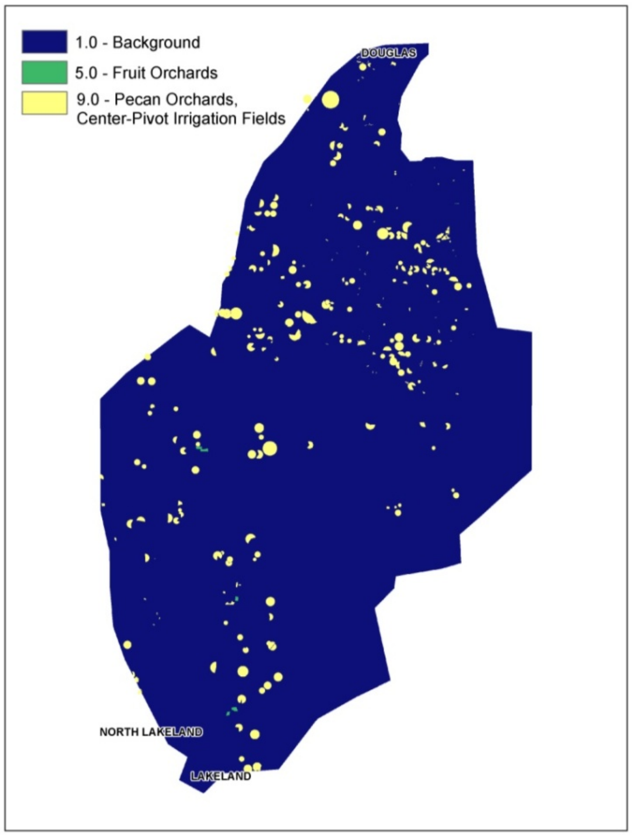
U.S. Geological Survey 7.5 minute Digital Elevation Models are used to derive slope. This area of the state has very low elevations and topographical relief. Some slope occurs along rivers and large streams. However, the scale of the data limits the identification of these areas. Therefore, a Slope Map Layer was not included in the Siting Model. **Figure 15.**

C. Intensive Agriculture

Intensive Agriculture includes fruit orchards, pecan orchards, and center-pivot irrigation fields, which are agricultural areas that would be affected by the location of a transmission line. Background is the absences of these features in the study area and receives the highest suitability value. Pecan orchards and center-pivot irrigation fields receive the lowest suitability value because transmission line corridors may have greater impact on this land use than on fruit orchards. In some circumstances, low growing fruit orchards may exist in the transmission line rights-of-way. These areas are modeled as a moderate level of suitability.

Features in this map layer receive 46.9% of the overall value in the Engineering Perspective. **Figure 30.**

Figure 30 –Intensive Agriculture Map Layer



2. Natural Environment Perspective Data

Like stated for the Engineering Perspective, the values for the map layers and features listed below are emphasized five times greater than the weights and values of the other two perspectives. By emphasizing the following datasets in **Table 20**, a distinct alternative is developed. Typically, the corridor produced by this perspective seeks areas of uplands and non-forested land uses. In some cases, these areas coincide with transportation corridors.

Table 20: Natural Env. Stakeholder Weights and Values

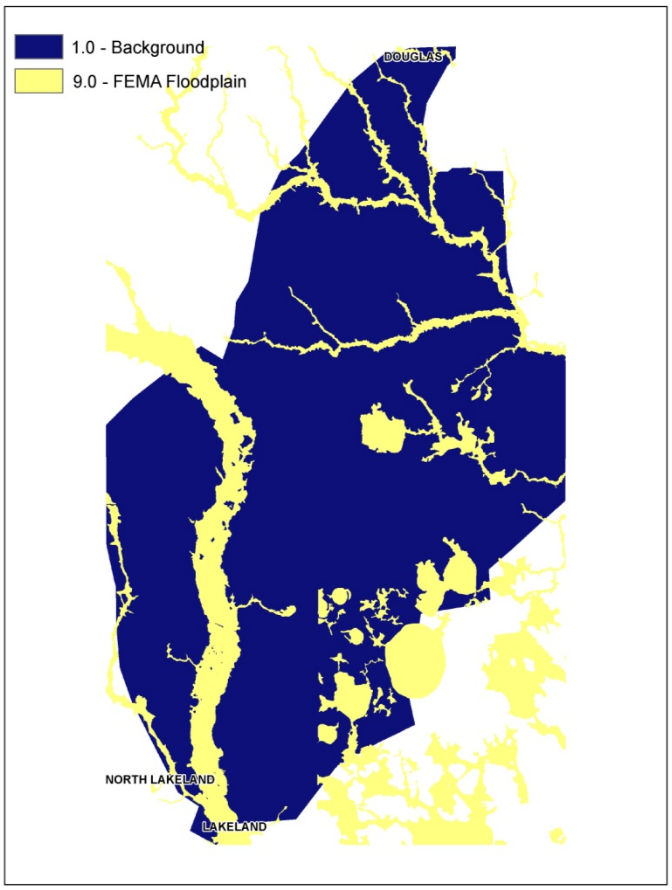
Natural Environment	
Floodplain	**6.2%**
Background	1
100 Year Floodplain	9
Streams/Wetlands	**20.9%**
Background	1
Streams < 5cfs+ Regulatory Buffer	5.1
Non-forested Wetlands	6.1
Rivers/Streams > 5cfs+ Regulatory Buffer	7.4
Salt Marsh	Not Present
Trout Streams (50' Buffer)	Not Present
Forested Wetlands	9
Public Lands and Easements	**16.0%**
Background	1
WMA - Non-State Owned	Not Present
Other Conservation Land	9
USFS	Not Present
WMA - State Owned	Not Present
Land Cover	**20.9%**
Open Land (Pastures, Scrub/Shrub, etc.)	1
Managed Pine Plantations	2.2
Row Crops and Horticulture	2.2
Developed Land	6.5
Hardwood/Mixed/Natural Coniferous Forests	9
Wildlife Habitat	**36.0%**
Background	1
Species of Concern Habitat	9

A. Floodplains

The absent of FEMA designated floodplains in the project area is the Background feature. This feature receives a high suitability value. FEMA designated floodplains areas receive a low suitability value in this map layer of the Siting Model. **Figure 31.** Floodplains are valuable to the natural environment by providing natural flood and erosion control, filtering runoff, and providing habitats for plants and wildlife.

Features in this map layer receive 6.2% of the overall value in the Natural Environment Perspective.

Figure 31 –Floodplain Map Layer



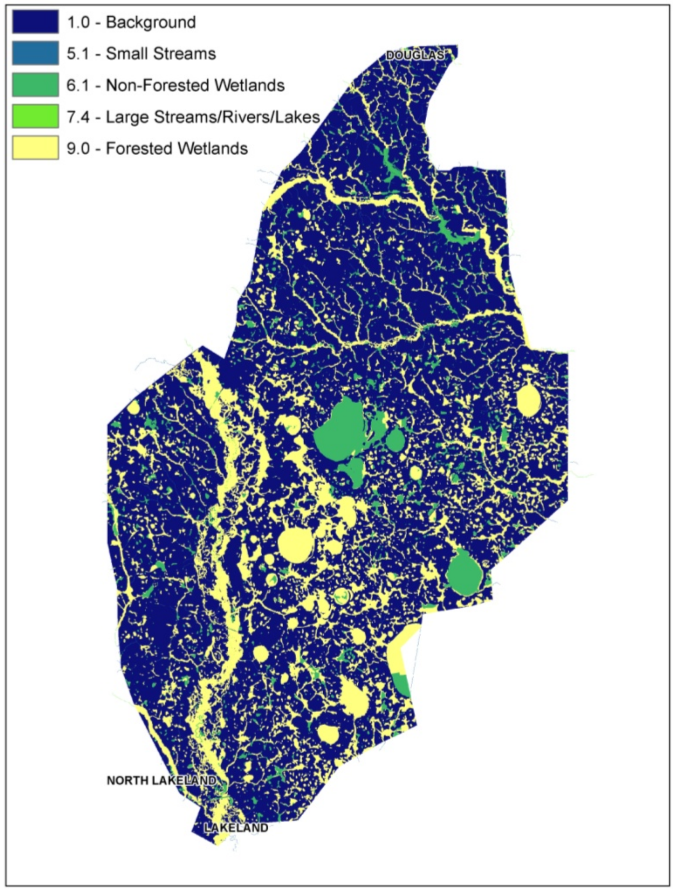
B. Streams/Wetlands

The Background features are upland areas within this map layer. These features received the highest suitability value. Streams are divided into three classes streams/rivers with a large flow (greater than 5 cubic feet per second), smaller streams (less than 5 cubic feet per second), and trout streams. There are no trout streams within this region of the state. Larger streams and rivers receive a lower suitability score than smaller streams due to potential impacts to water quality from possible vehicular crossings.

Wetlands are divided into three categories: Forested Wetlands, Non-Forested Wetlands, and Salt Marsh. Salt Marshes are not present in the project area. Forested Wetlands receive a lower suitability value due to the vegetation change that occurs during the construction and maintenance of a proposed transmission line.

Features in this map layer receive 20.9% of the overall value in the Natural Environment Perspective. **Figure 32.**

Figure 32 –Streams and Wetlands Map Layer



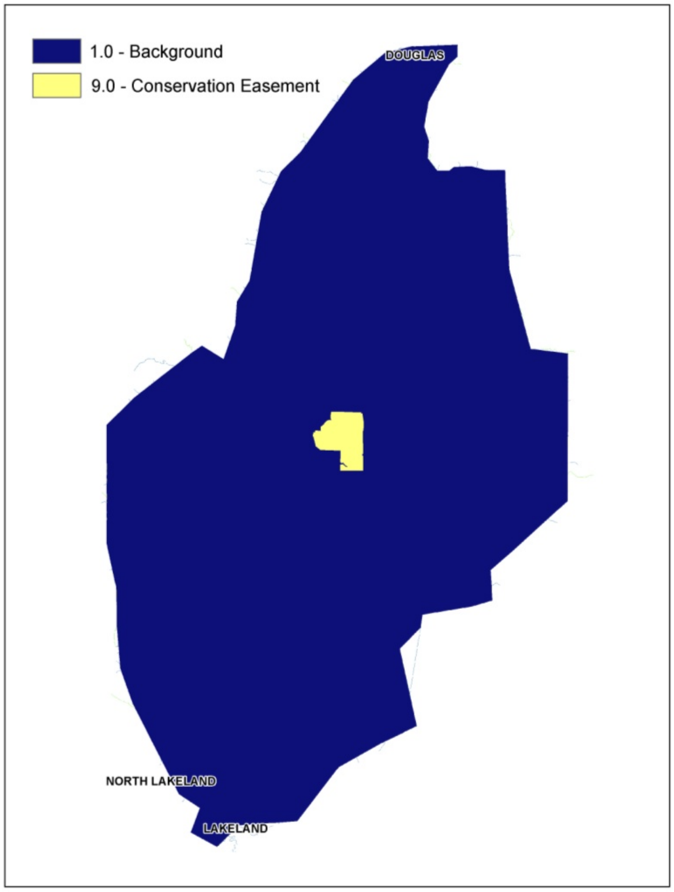
C. Public Lands and Easements

Public lands and conservation easements can provide protection to species and habitat.

Background is the absence of public lands or known conservation easements. This feature receives the highest suitability in this map layer. No federal or state public lands were identified within the study area, including U.S. Forest Service land or state managed or owned wildlife management areas. One large conservation easement was discovered in the NRCS database. This feature received the lowest suitability value in this map layer. **Figure 33.**

Features in this map layer receive 16.0% of the overall value in the Natural Environment Perspective.

Figure 33 –Public Lands and Easements Map Layer r

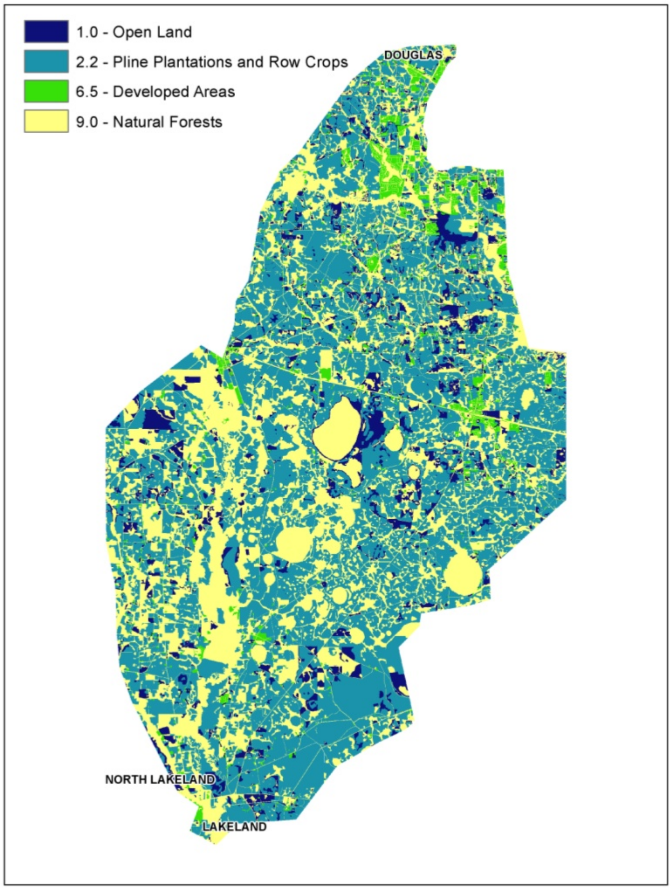


D. Land Cover

Land Cover is derived from the Land Use / Land Cover dataset shown in **Figure 18.** Open land, which includes pastures, scrub/scrub, and clear cut forests, received the highest suitability value. Pine plantations and cultivated areas received the next highest suitability value in this map layer. Developed lands received a moderate suitability score, while natural areas including forests and water bodies received the lowest suitability values in this layer. **Figure 34.**

Features in this map layer receive 20.9% of the overall value in the Natural Environment Perspective.

Figure 34 –Land Cover Map Layer



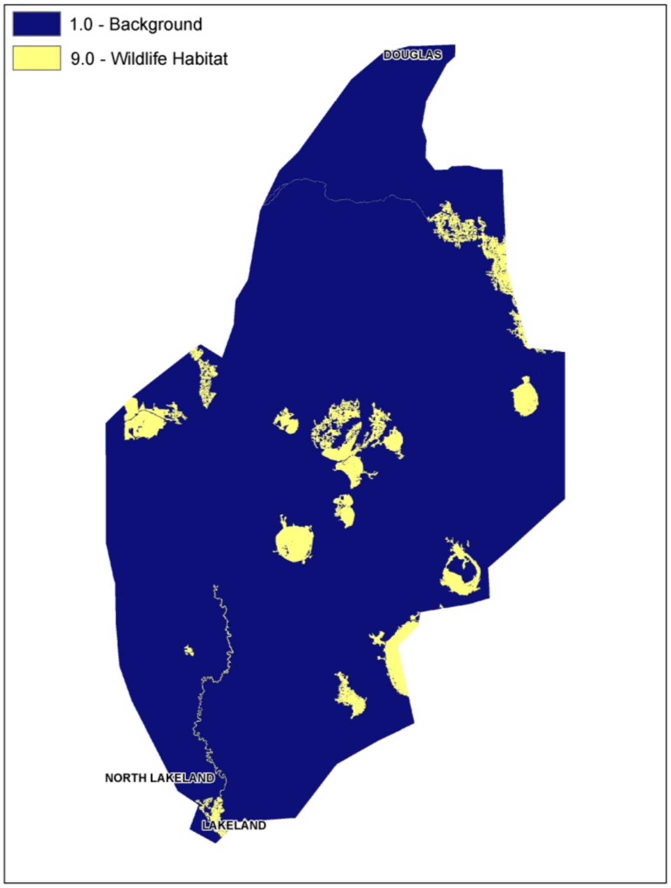
E. Wildlife Habitats

As a surrogate for species occurrence data in the Siting Methodology, GTC has incorporated data from the Conservation Opportunity Areas study that was developed as an aid for the Georgia's Wildlife Action Plan. These areas were identified based on their biodiversity potential.
(http://georgiawildlife.com/node/1378).

In addition, High Priority Waters are also incorporated into this dataset. These streams contain High Priory Species as designated by GADNR.
(http://www.georgiawildlife.com/node/1377).

Features in this map layer receive 36.0% of the overall value in the Natural Environment Perspective. **Figure 35.**

Figure 35 –Wildlife Habitats Map Layer



3. Built Environment Perspective Data

The values for the map layers and features listed below are emphasized five times greater than the weights and values of the other two perspectives. By emphasizing the following datasets in **Table 21**, a distinct alternative is developed. Typically, the corridor produced by this perspective seeks areas of less urban density and undeveloped areas. With development usually along transportation routes, this corridor most likely takes a cross-country path.

Table 21: Built Env. Stakeholder Weights and Values

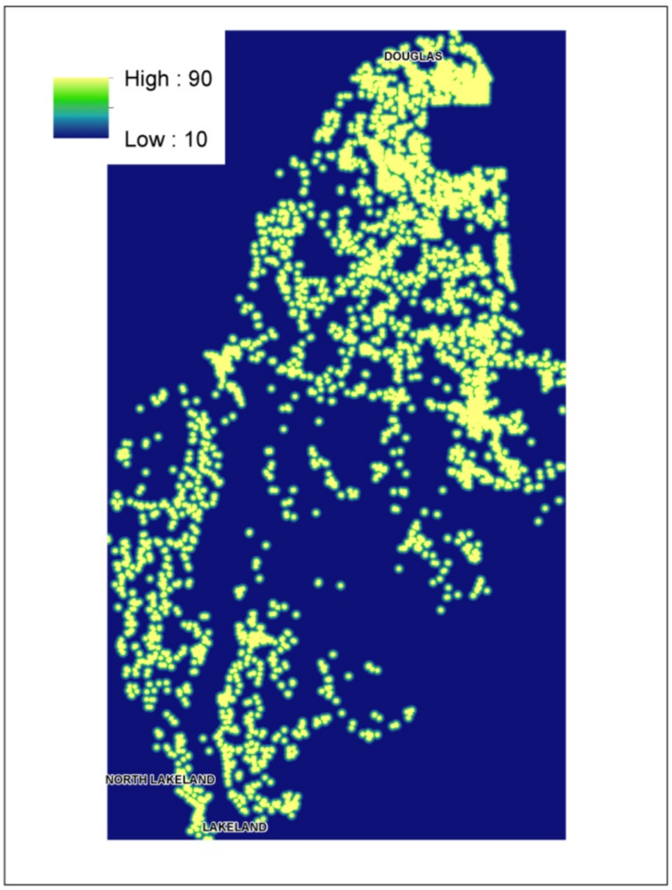
Built Environment	
Proximity to Buildings	**11.5%**
>1200’	1
900’-1200’	1.8
600’-900’	2.6
300’-600’	4.2
0-300’	9
Eligible NRHP Historic Resources	**13.9%**
Background	1
0 – 1500’ (APE)	9
Building Density	**37.4%**
0 - 0.05 Buildings/Acre	1
0.05 - 0.2 Buildings/Acre	3.7
0.2 - 1 Buildings/Acre	6.3
1 - 4 Buildings/Acre	9
4 - 25 Buildings/Acre	Not Present
Proposed Development	**6.3%**
Background	1
Proposed Development	9
Spannable Lakes and Ponds	**3.8%**
Background	1
Spannable Lakes and Ponds	9
Major Property Lines	**8.0%**
Edge of field	1
Landlots	7.9
Background	9
Land Use	**19.1%**
Undeveloped	1
Non-Residential	3
Residential	9

A. Proximity to Buildings

This map layers measures distances from individual buildings. As the distance from building increases, the suitability value increases. This layer models areas where a transmission line would have a greater probability of encountering features not compatible with transmission line easements. **Figure 36.** These features could include yards, trees, tall shrubs, outbuildings, signs, awnings, antennas, and wells.

Features in this map layer receive 11.5% of the overall value in the Built Environment Perspective.

Figure 36 –Building Proximity Map Layer

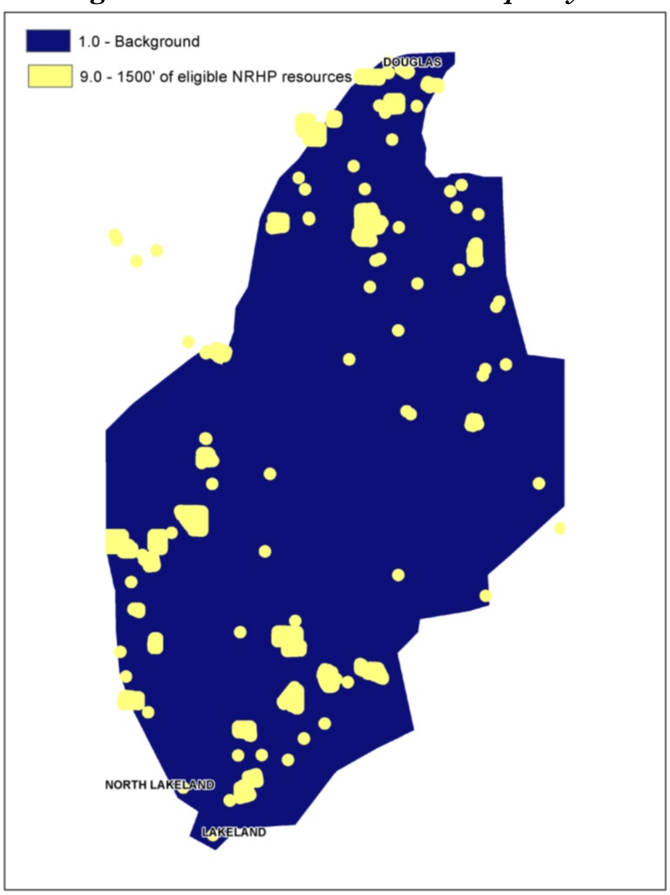


B. Eligible NRHP Historic Resources

This is a layer of cultural resources data taken from historic structure and district surveys conducted in the Spring of 2012. Each structure or district has a 1500 feet buffer placed around it. The buffer models the Area of Potential Effect (APE) that a proposed transmission line corridor may have to the cultural resource. The purpose of this layer is to develop corridors that minimize the potential effect on historic resources that are eligible or possibly eligible for listing in the NRHP. These resources include both individual resources (or sites) and districts. Background is the area outside the APE. It receives the highest suitability value in this layer. Areas inside the APE receive the lowest suitability value. **Figure 37.**

Features in this map layer receive 13.9% of the overall value in the Built Environment Perspective.

Figure 37 –Historic Resource Map Layer

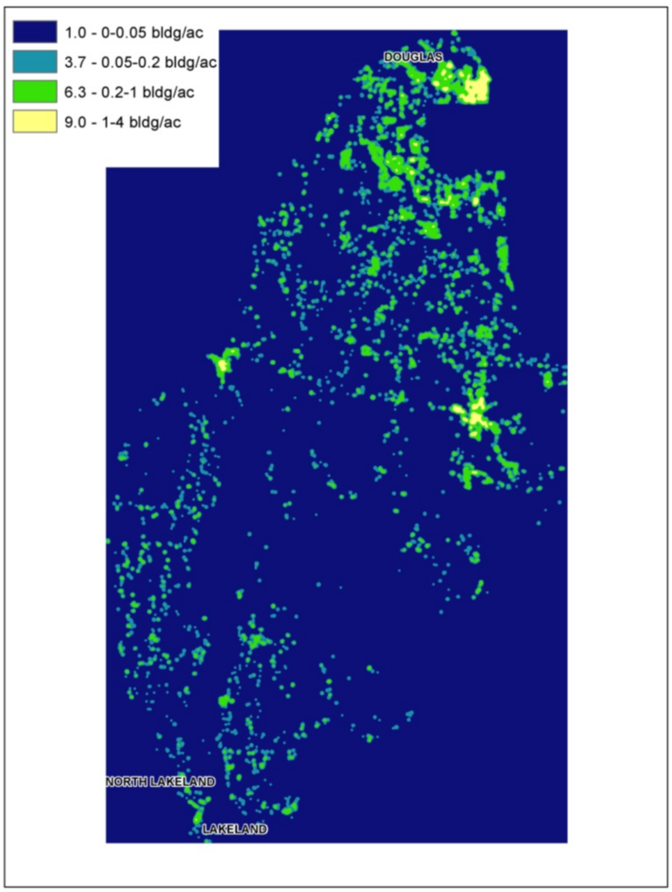


C. Building Density

This layer utilizes individual building locations in the study area to calculate building density. **Figure 38.** The less dense areas of the study area from a Built Environment Perspective have higher suitability values. Dense areas are located around the cities in and near the project area. More moderate density occurs in the unincorporated areas of Coffee County, Atkinson County north of U.S. Highway 82, along River Road in Lanier County, and State Route 135 in Berrien County. The lowest density occurs in southern Atkinson County and northwest Clinch County.

Features in this map layer receive 37.4% of the overall value in the Built Environment Perspective.

Figure 38 –Building Density Map Layer

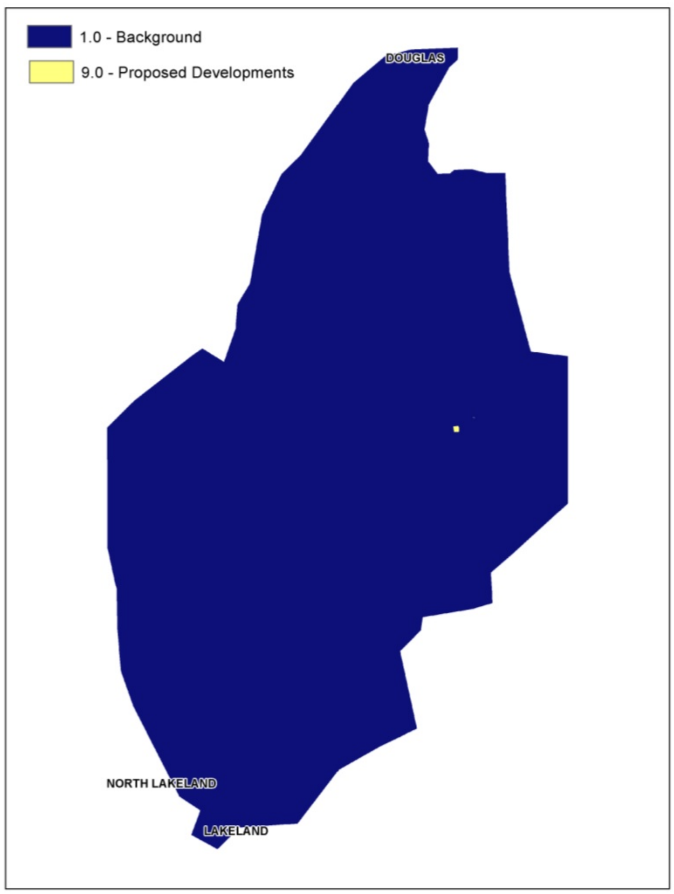


D. Proposed Development

The data for this layer comes from city and county zoning and tax assessor offices. With the exception of the incorporated areas, much of the study is very rural in nature. Only two proposed developments were discovered during the research. Both proposed developments were in the City of Pearson: one being a future business park and another being a farmer's market. Background in this map layer is the area outside proposed developments. It received the highest suitability value. The proposed developments received the lowest suitability value. **Figure 39.**

Features in this map layer receive 6.3% of the overall value in the Built Environment Perspective.

Figure 39 –Proposed Developments Map Layer

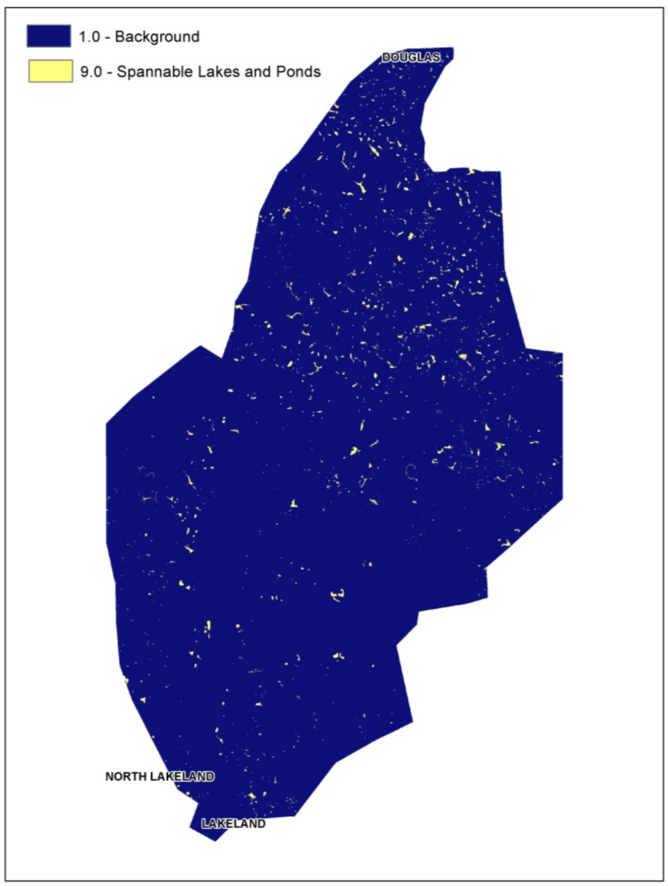


E. Spannable Lakes and Ponds

This map layer represents small ponds and fingers of lakes that can be spanned with a transmission line without having to locate an intermediate structure in the water body. Background features are areas outside the lakes and ponds and receives the highest suitability value in this map layer. Lakes and ponds have multiple constraints. They present an access obstacle for both construction and maintenance, provide habitat for avian species, and may have cultural value to the landowners and the community. Therefore, lakes and ponds receive the lowest suitability value in this map layer. **Figure 40.**

Features in this map layer receive 3.8% of the overall value in the Built Environment Perspective.

Figure 40 –Spannable Lakes and Ponds Map Layer

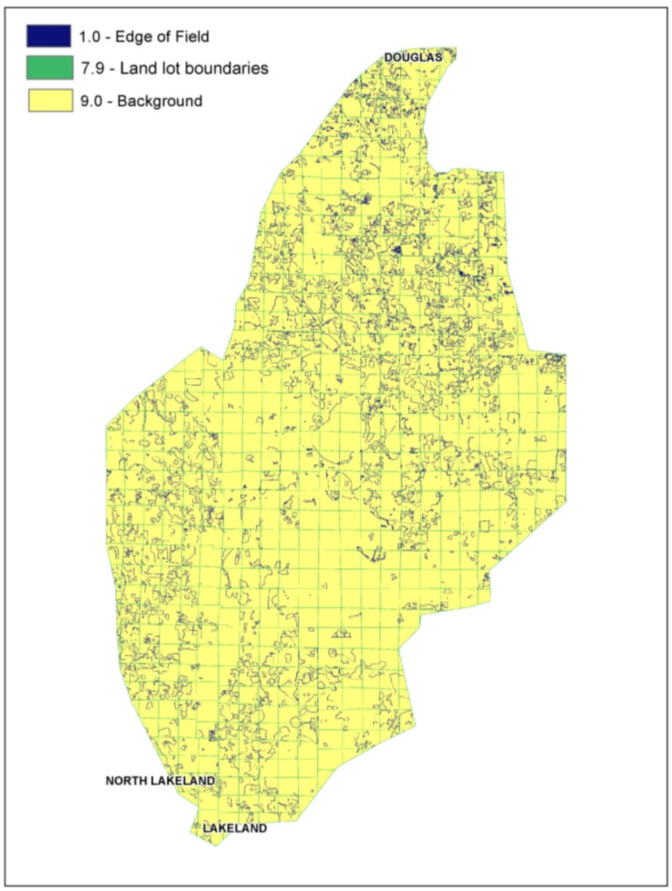


F. Major Property Lines

This layer models major property lines by locating land use edges between fields and forested areas and by identifying land lot lines. Land lots are used as major land divisions in Georgia for approximately ¾ of the western side of the state. Land lots are usually square, lending to long straight property lines. Edge of fields receive the highest suitability value, land lot boundaries a moderate suitability value, and background receives the lowest suitability value in this map layer. **Figure 41.**

Features in this map layer receive 8.0% of the overall value in the Built Environment Perspective.

Figure 41 –Major Property Lines Map Layer

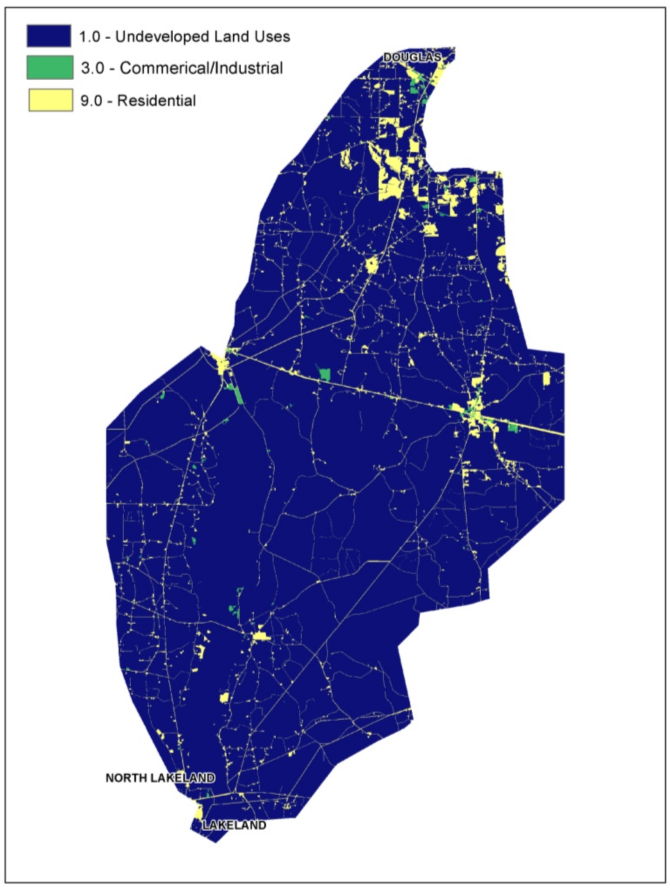


G. Land Use

Similar to the Land Cover map layer, Land Use is derived from the Land Use / Land Cover dataset shown in **Figure 18.** Undeveloped land uses receive the highest level of suitability in this map layer. Commercial/Industrial receives a moderate level of suitability. Residential land use receives the lowest value of suitability in this map layer. **Figure 42.**

Features in this map layer receive 19.1% of the overall value in the Built Environment Perspective.

Figure 42 –Land Use Map Layer



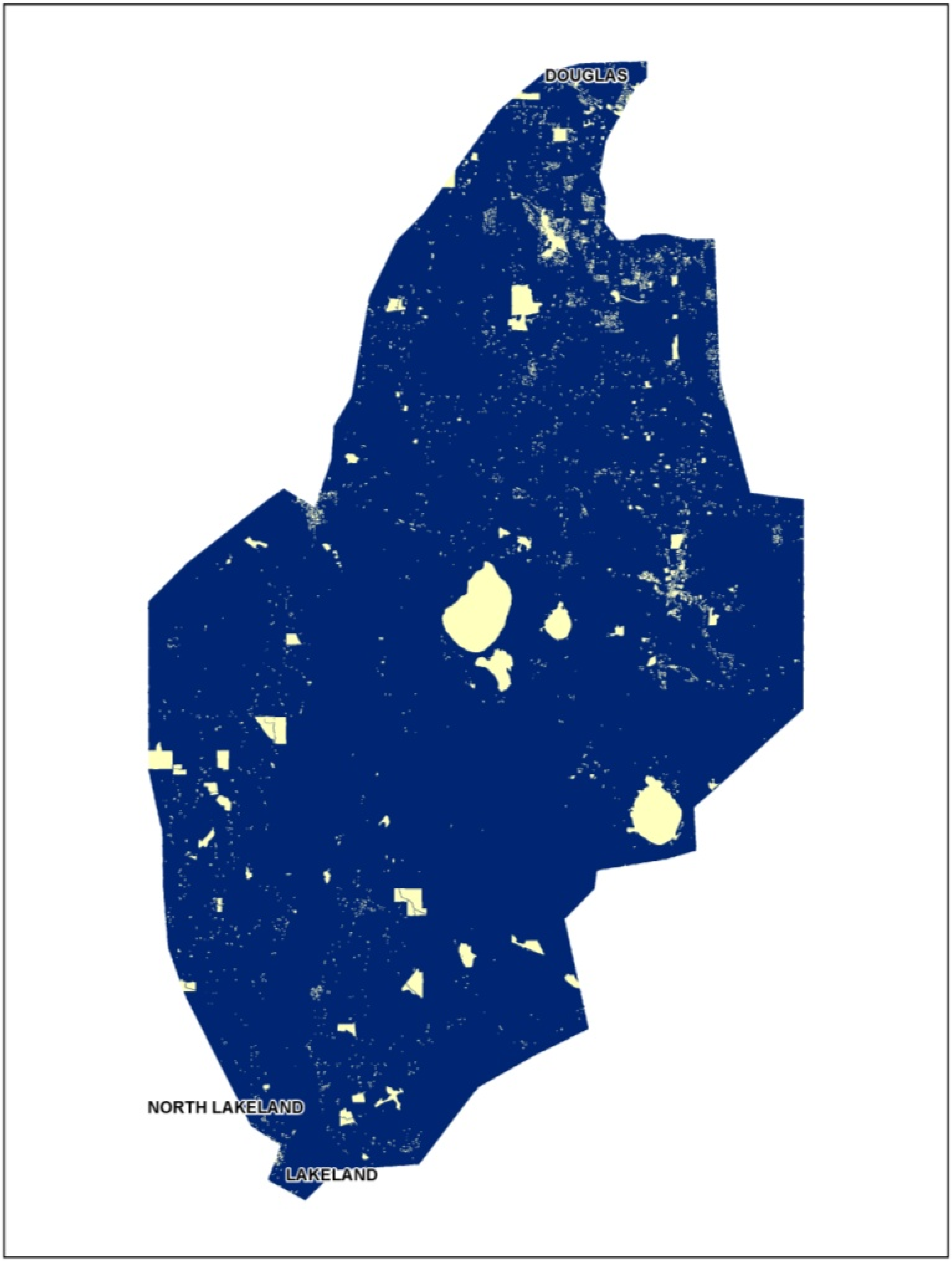
4. Areas of Least Preference

Areas of Least Preference are additional features that are incorporated in the suitability surfaces for each preference perspective. **Table 22.** The features are modeled so that the alternative corridors that are generated will not cross them. Features are identified as Least Preference due to engineering constraints, regulatory issues, or cultural significance. **Figure 43.**

Table 22: Areas of Least Preference

Areas of Least Preference	
Listed Archaeology Sites	Not Present
Listed NRHP Districts and Buildings	Present
Eligible NRHP Districts	Present
Airports/Airstrips	Present
EPA Superfund Sites	Not Present
Non-Spannable Waterbodies	Present
State and National Parks	Not Present
Military Facilities	Not Present
City and County Parks	Present
Mines, Quarries, Landfills	Present
Day Care Parcels	Not Present
Cemetery Parcels	Present
School Parcels (K-12)	Present
Church Parcels	Present
USFS Wilderness Area	Not Present
Wild/Scenic Rivers	Not Present
Areas of Ritual Importance	Unknown
National Wildlife Refuge	Not Present
Buildings	Present

Figure 43 –Areas of Least Preference



5. Suitability Models

The composite of map layers for each perspective and the Areas of Least Preference are combined based on the assigned weights to create overall suitability surfaces. **Table 23 & Figure 44.** Once combined, the suitability surfaces for each perspective are combined to create four models in order to generate alternative corridors. **Figures 45, 46, 47 & 48.**

Table 23: Stakeholder Map Layer Weights

Engineering		Natural Environment		Built Environment	
Linear Infrastructure	53.1%	Floodplain	6.2%	Proximity to Buildings	11.5%
Slope	0.0%	Streams/Wetlands	20.9%	Eligible NRHP Historic Resources	13.9%
Intensive Agriculture	46.9%	Public Lands / Easements	16.0%	Building Density	37.4%
		Land Cover	20.9%	Proposed Development	6.3%
		Wildlife Habitat	36.0%	Spannable Lakes and Ponds	3.8%
				Major Property Lines	8.0%
				Land Use	19.1%

Figure 44 –Suitability Surfaces

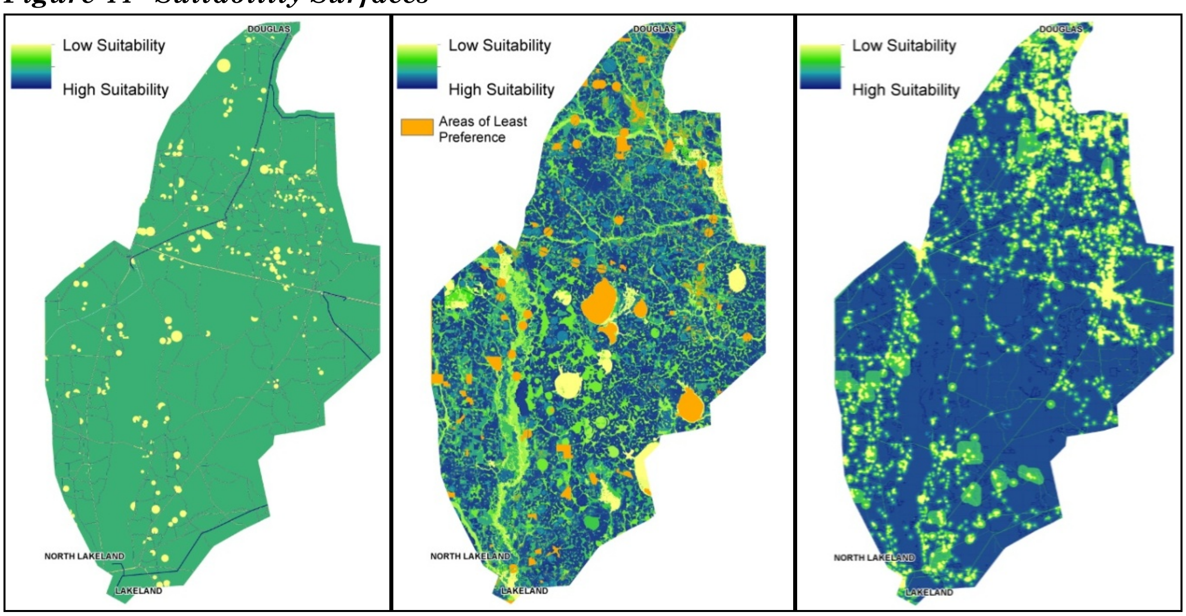


Figure 45 –Suitability Model: Engineering Emphasis
(Engineering Perspective X 5 + Natural Environment Perspective + Built Environment Perspective) / 7

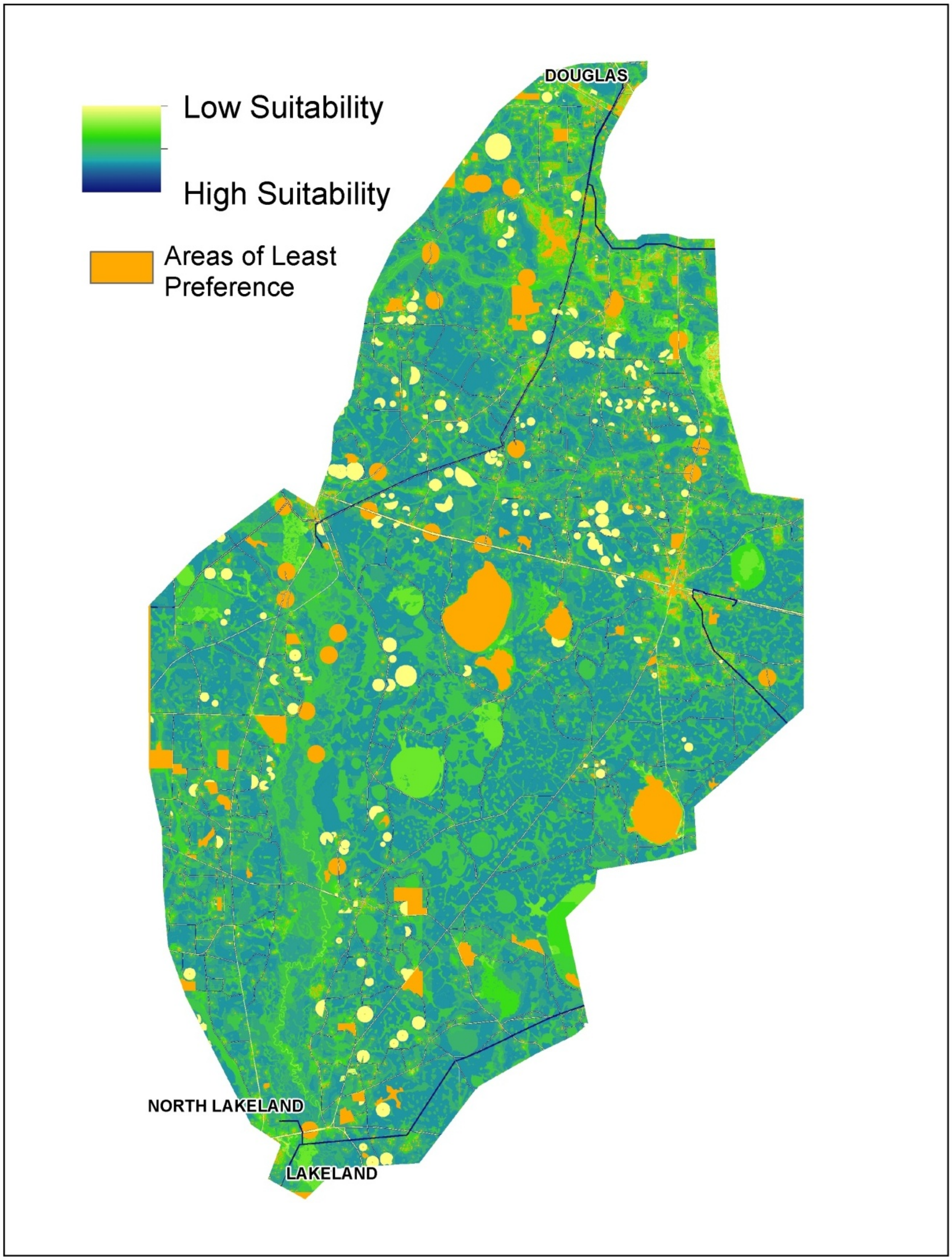


Figure 46 – Suitability Model : Natural Environment Emphasis
(Engineering Perspective + Natural Environment Perspective X 5 + Built Envir

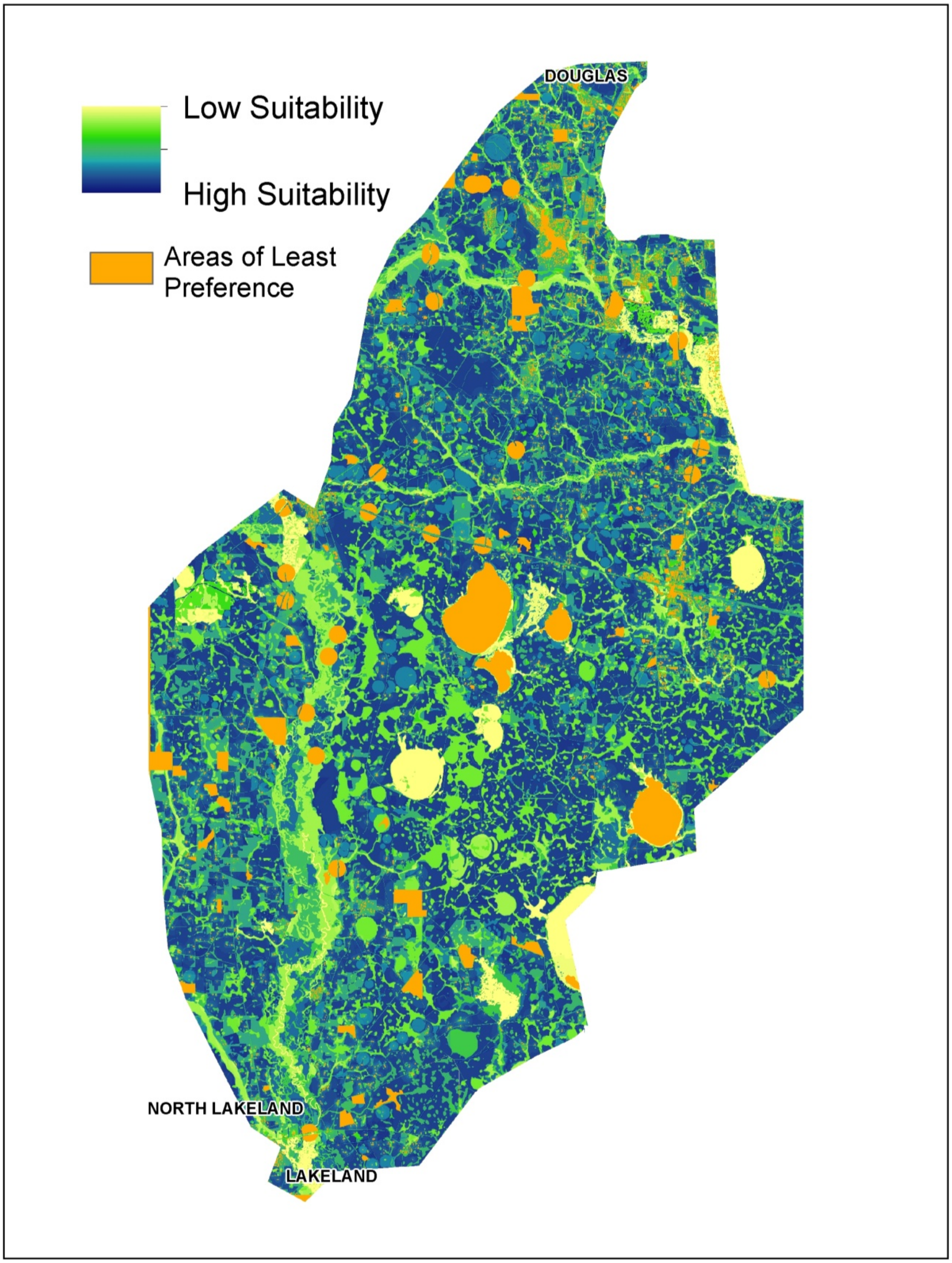


Figure 47 – Suitability Model: Built Environment Emphasis
(Engineering Perspective + Natural Environment Perspective + Built Environment Perspective X 5) / 7

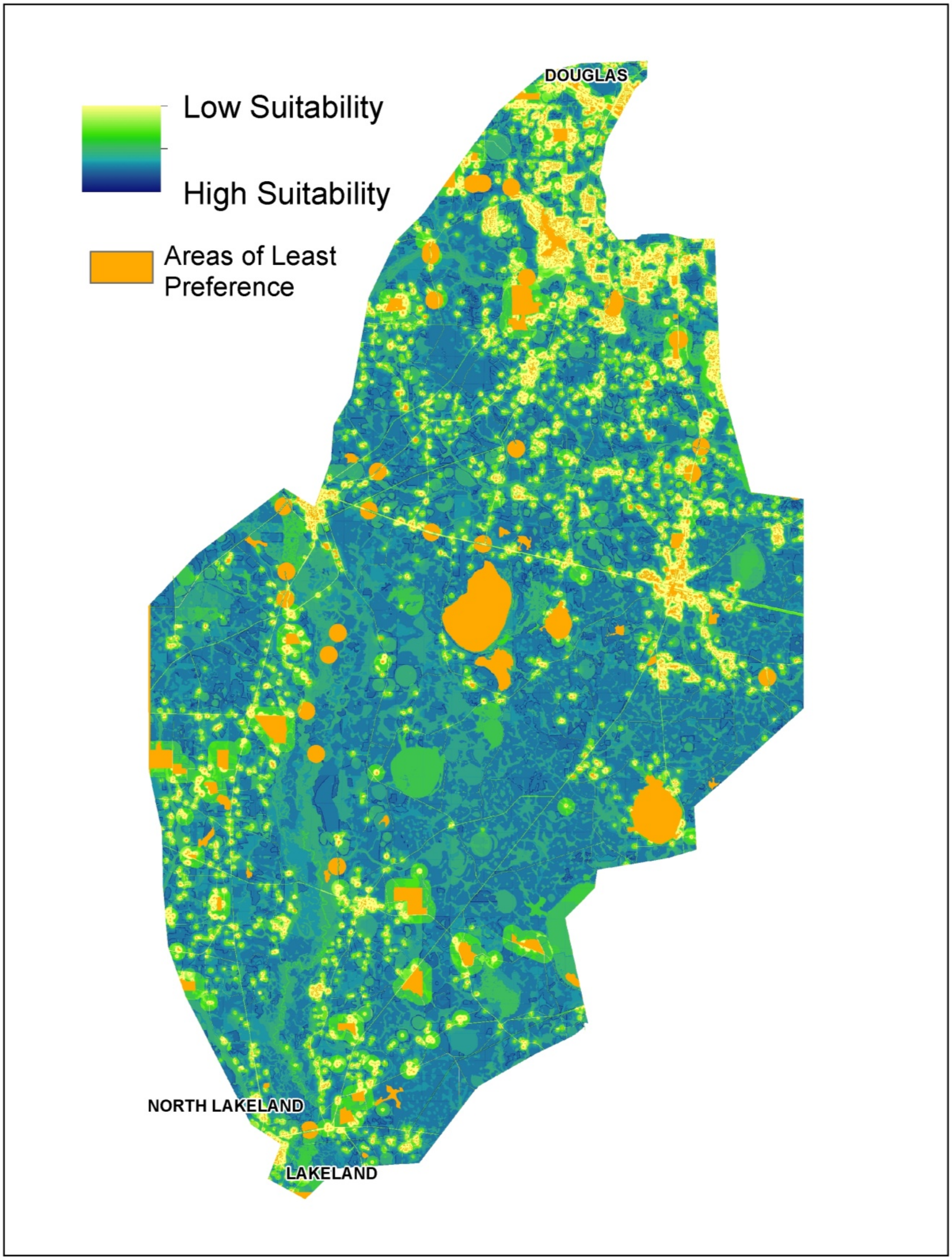
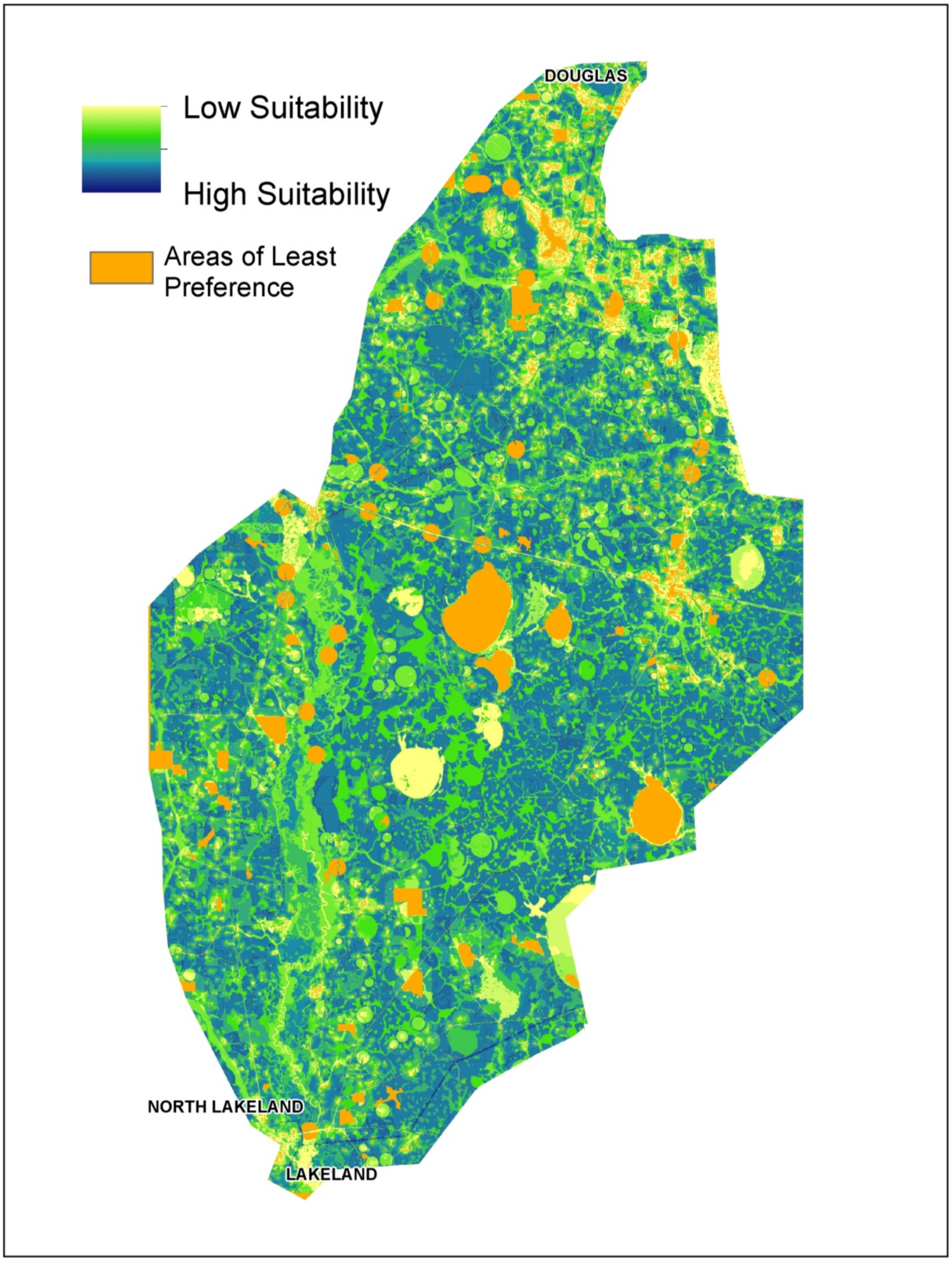


Figure 48 – Suitability Model: Simple Average
(Engineering Perspective + Natural Environment Perspective + Built Environment Perspective) /



3

6. Alternate Corridors

An alternate corridor (Phase Two Corridor) is generated from each suitability model. These corridors are produced by applying an algorithm that assigns a preference value to all areas in the study area while also considering connectivity between the two project end-points. This allows diverse corridor alternatives to be generated that consider all features utilized in the Siting Model. The top 3% of possible preferred areas are used to define the corridors, which are the areas of least impact to communities, least impacts to the natural environment, co-location opportunities with existing linear infrastructure, and reasonably suited for the construction of a transmission line. As mentioned in the introductory portion of Section VI of this report, the corridors were developed using the following models:

Engineering Alternative Corridor Model =
((Engineering Surface × 5) + Natural Env. Surface + Built Env. Surface) ÷ 7

Natural Environment Alternative Corridor Model =
(Engineering Surface + (Natural Env. Surface × 5)+ Built Env. Surface) ÷ 7

Built Environment Alternatie Corridor Model =
(Engineering Surface + Natural Env. Surface + (Built Env. Surface × 5)) ÷ 7

Simple Average Corridor Model =
(Engineering Surface + Natural Env. Surface + Built Env. Surface) ÷ 3

A. Engineering Corridor

The Engineering Corridor begins at the existing Douglas Substation on the northwest side of the City of Douglas. It extends south, co-locating with a corridor of existing transmission lines, which contains sections of the Douglas – Wilsonville 230 kV, Douglas – Baker Highway 230 kV, Douglas – Heritage Hills 46 kV, and Douglas – Douglas#2 115kV Transmission Line. The area has mixed land use of residential, commercial/industrial, forested, and agriculture. The corridor extends 3.8 miles to the existing Baker Highway Substation.

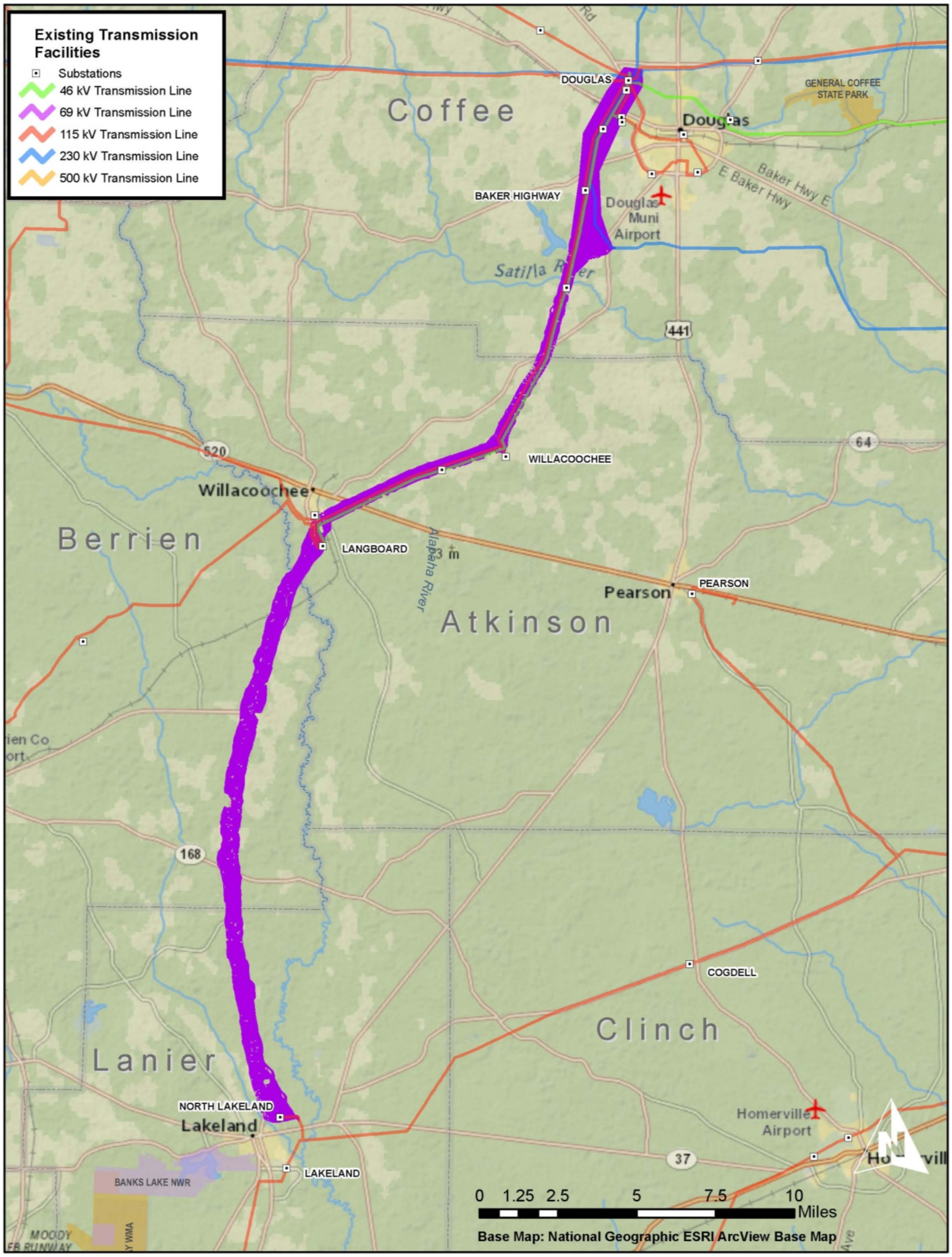
The Engineering Corridor continues along the existing transmission lines south of Baker Highway Substation. The existing transmission line corridor contains the existing Baker Highway – Langboard 115kV and Douglas – Heritage Hills/Langboard-Quinton Dillingham 46 kV transmission lines. This section of the Engineering Corridor begins in a residential area and transitions into an area dominated by agricultural land use. The Engineering

Corridor passes on the southeastern side of the City of Willachoochee to the existing Langboard Substation. This section of the proposed corridor is 15.4 miles.

After passing the Langboard Substation, the proposed corridor transitions to co-located with a north-south transportation corridor, State Route 135. The Engineering Corridor crosses the Alapaha River into Berrien County with the highway. The Engineering Corridor crosses in Lanier County. It remains co-located with the State Route 135 until transitioning to the existing North Lakeland Tap 115kV Transmission Line on the north side of the City of Lakeland. The land use along State Route 135 is predominately forested and agriculture with rural residential development dispersed along the route. This section of the proposed corridor is 20.3 miles.

The total length of this corridor is 39.5 miles. It passes through Coffee, Atkinson, Berrien, and Lanier Counties. **Figure 49.**

Figure 49 –Engineering Corridor



B. Natural Environment Corridor

The Natural Environment Corridor begins at the existing Douglas Substation on the northwest side of the City of Douglas. It moves south along the existing transmission line corridor, which contains sections of the Douglas – Wilsonville 230 kV, Douglas – It extends south, co-locating with a corridor of existing transmission lines.Baker Highway 230 kV, Douglas – Heritage Hills 46 kV, and Douglas – Douglas#2 115kV Transmission Line. The area has mixed land use of residential, commercial/industrial, forested, and agriculture. The Natural Environment Corridor extends 3.8 miles to the existing Baker Highway Substation.

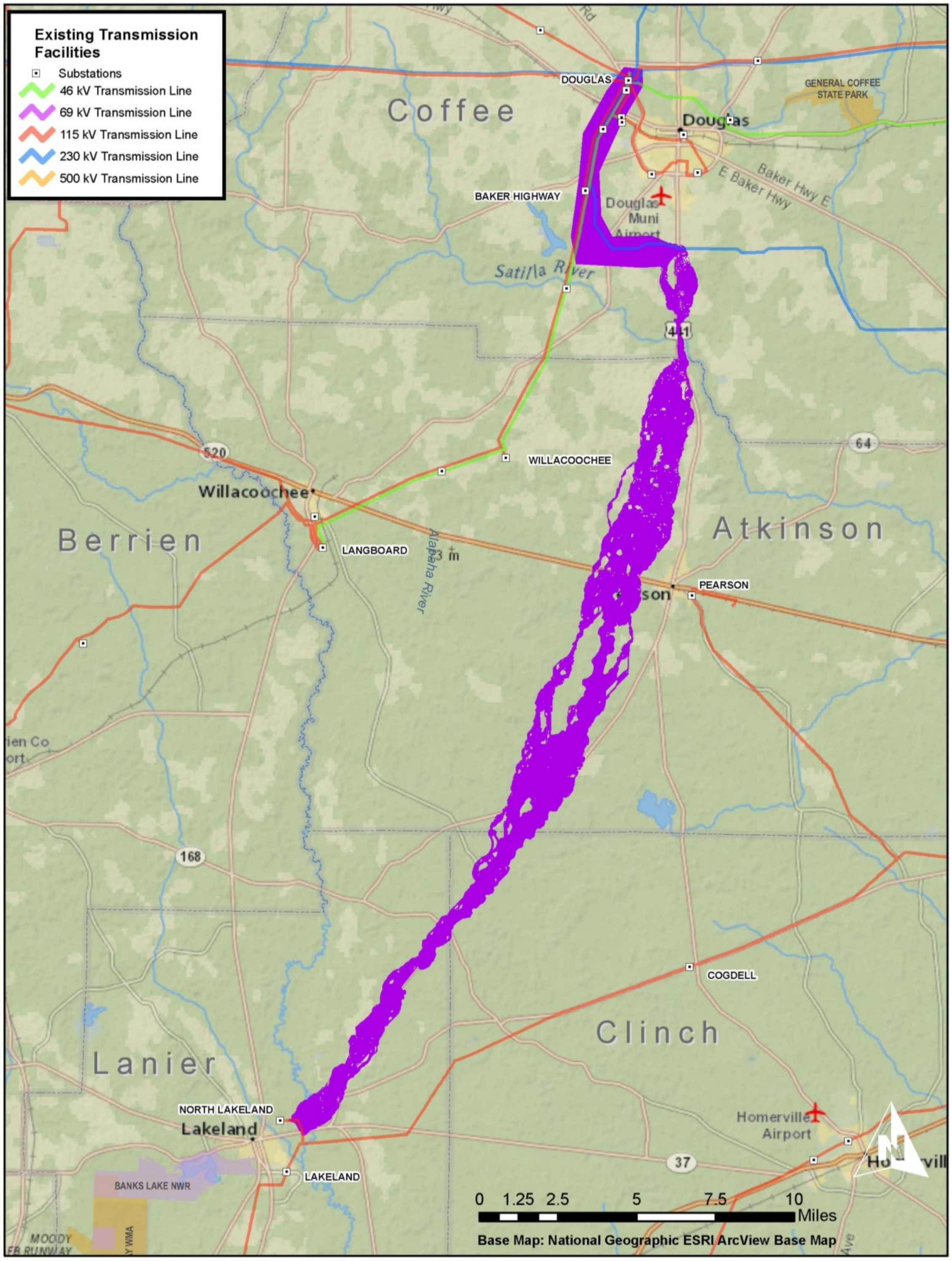
Once past the Baker Highway Substation, the Natural Environment Corridor continues to co-locate with the Douglas – Wilsonville 230 kV Transmission Line. This section of the Natural Environment Corridor turns toward the east around the periphery of the City of Douglas. The Douglas Municipal Airport is to the north of the existing transmission line corridor. This section of the Natural Environment Corridor continues east for 4.4 miles until reach U.S. Highway 441/221.

Once reaching U.S. Highway 441/221, the Natural Environment Corridor turns to the south along the highway. It departs from the highway to the west for several miles in order to bypass the dense development in the center of Pearson as well as to bypass its historic resources. This corridor comes back to U.S. highway 221 south of Pearson and the U.S. Highway 441 split. This section of the Natural Environment Corridor is predominately agricultural with rural residential and commercial development along the transportation routes. It is approximately 16.8 miles in length. A route through this section would likely follow property lines and unpaved county roads to navigate around the City of Pearson.

The last section of the Natural Environment Corridor continues following U.S. Highway 221 through portions of Atkinson, Clinch and Lanier County. This corridor crosses the Alapaha River adjacent to the highway until reaching the North Lakeland Tap 115 kV Transmission Line. This section of the Natural Environment Corridor is approximately 17.7 miles in length. It is characterized as mainly forested and agricultural with very sparse rural residential development, becoming slightly denser as the corridor approaches with City of Lakeland.

The total length of this corridor is 42.7 miles. It crosses through portions of Coffee, Atkinson, Clinch, and Lanier Counties. **Figure 50.**

Figure 50 –Natural Environment Corridor



C. Built Environment Corridor

The Built Environment Corridor begins at the existing Douglas Substation on the northwest side of the City of Douglas. It extends south along the existing transmission line corridor, which contains sections of the Douglas – Wilsonville 230 kV, Douglas – Baker Highway 230 kV, Douglas – Heritage Hills 46 kV, and Douglas – Douglas#2 115kV Transmission Line. The area has mixed land use of residential, commercial/industrial, forested, and agriculture. The Built Environment Corridor extends 3.8 miles to the existing Baker Highway Substation.

Once past the Baker Highway Substation, the Built Environment Corridor continues along the Douglas – Wilsonville 230 kV Transmission Line to State Route 135. This section of the corridor is approximately 2 miles in length.

The Built Environment Corridor becomes very broad due to the undeveloped nature of the study and develops three main branches: eastern, central, and western.

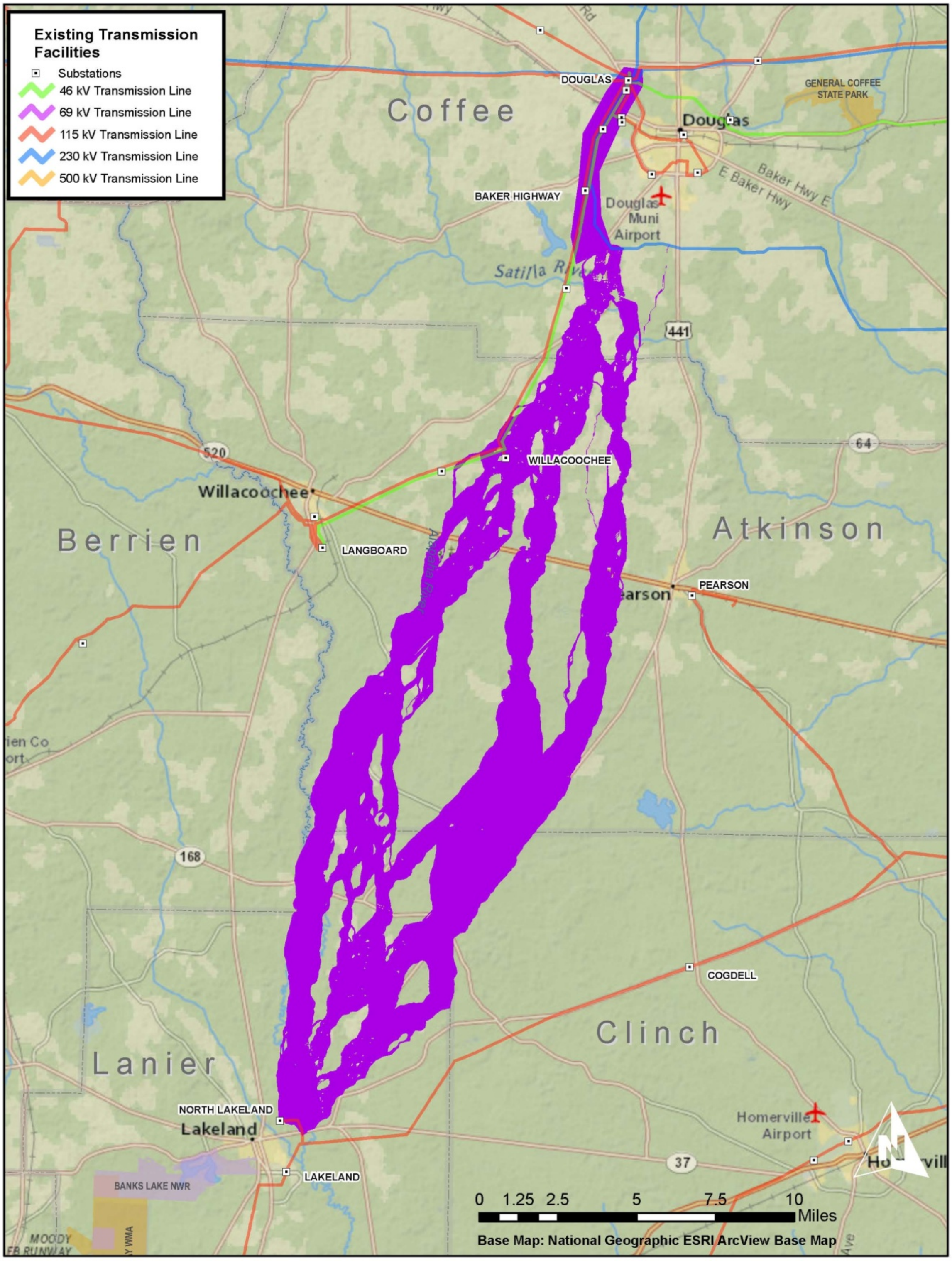
The eastern branch continues along State Route 135 and then to Old Douglas Highway for 9 miles. As Old Douglas Highway turns towards a southeastern direction towards the City of Pearson, the corridor continues due south. It mimics the Natural Environment Corridor until reaching the termination along the North Lakeland Tap 115 kV Transmission Line. This section is approximately 24.5 miles. The total length is 39.3 miles. It passes through Coffee, Atkinson, Clinch, and Lanier Counties.

The central branch leaves the existing Douglas – Wilsonville 230 kV Transmission Line near State Route 135. The Built Environment Corridor moves cross-country in a southerly direction until reaching Sunnyside Church Road and the community of Kirkland after approximately 11 miles. The corridor continues southerly direction south of U.S. Highway 82 for approximately 8 miles until reaching State Route 64. The Built Environment Corridor generally parallels the highway in a southwesterly direction until transitioning to Old River Road in Lanier County. The corridor crosses the Alapaha River to reach the North Lakeland Tap 115 kV Transmission Line. This section is 12.7 miles and the total length utilizing this branch is 37.5 miles. It passes through Coffee, Atkinson, and Lanier Counties

The western branch leaves the existing Douglas – Wilsonville 230 kV Transmission Line near State Route 135 and continues cross-country in a south-southwesterly direction until reaching Antioch Church Road near the existing Willachoochee substation. The section of corridor is approximately 7 miles. The corridor continues in a south-southwesterly direction, crossing U.S. Highway 82, and occupies with floodplain of the Alapaha until reaching the North Lakeland Substation after approximately 23 miles.

This total length of this corridor is 35.8 miles. It passes through Coffee, Atkinson, and Lanier Counties. **Figure 51.**

Figure 51 –Built Environment Corridor



D. Simple Average Corridor

The Simple Average Corridor begins at the existing Douglas Substation on the northwest side of the City of Douglas. It extends south along the existing transmission line corridor, which contains sections of the Douglas – Wilsonville 230 kV, Douglas – Baker Highway 230 kV, Douglas – Heritage Hills 46 kV, and Douglas – Douglas#2 115kV Transmission Line. The area has mixed land use of residential, commercial/industrial, forested, and agriculture. The corridor extends 3.8 miles to the existing Baker Highway Substation.

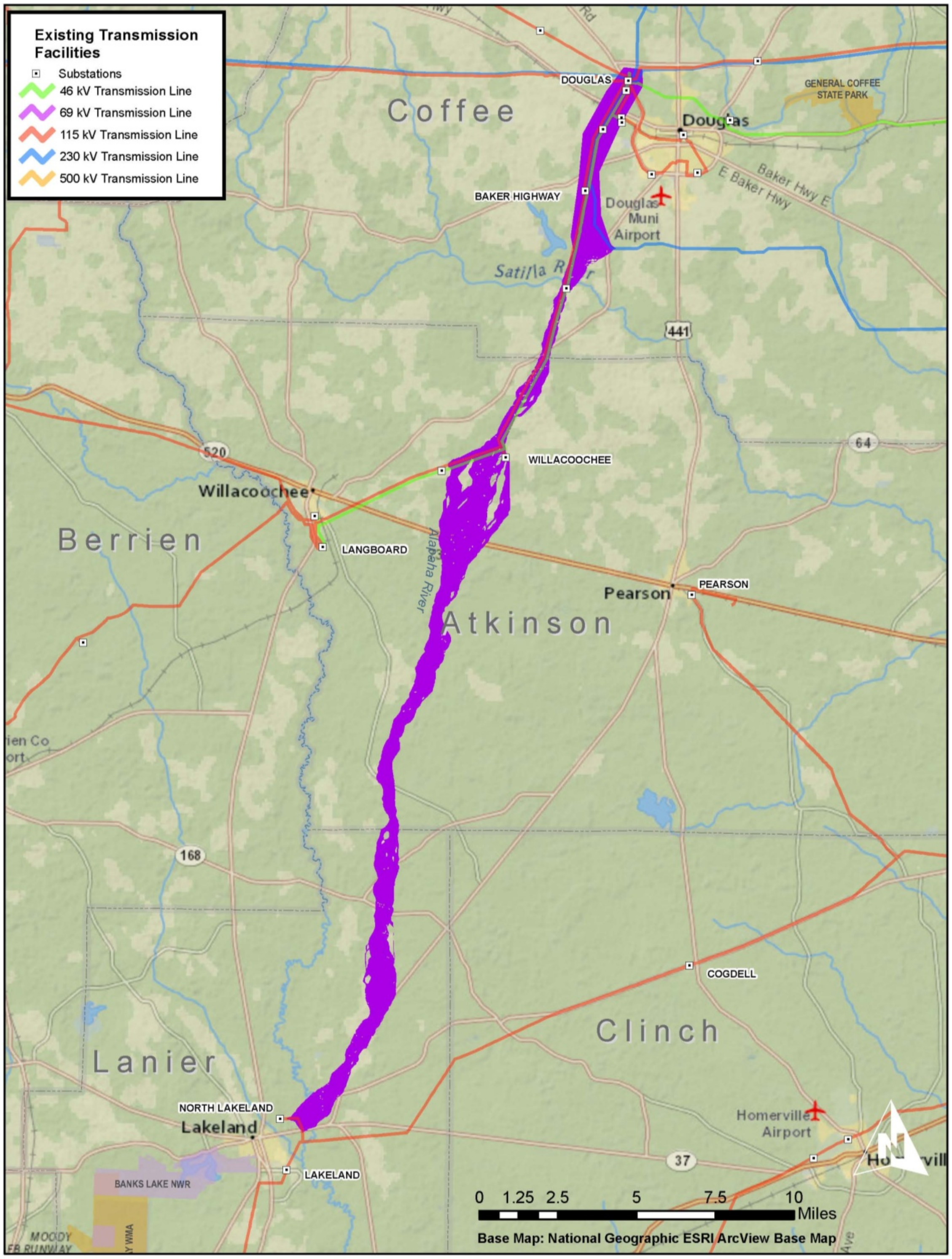
The Simple Average Corridor continues along the existing transmission line south of Baker Highway. The existing corridor contains the existing Baker Highway – Langboard 115kV and Douglas – Heritage Hills 46 kV transmission lines. The area begins in a residential area and transitions into an area dominated by agricultural use. At the existing Willachoochee Substation, the corridor turns towards the south and leaves the existing transmission line corridor after 9 miles.

The Simple Average Corridor moves in a southerly direction utilizing a series of road and cross-country sections. The roads along the corridor are Antioch Church Road, Lazy Nine Road, Bill Powell Road, Live Oak Road, Burkhalter Road, and Mud Creek Road. After approximately 21 miles, the corridor reaches U.S. Highway 221. This section of corridor is characterized as extremely rural, becoming slightly denser with rural residential development as the corridor moves into Lanier County.

The last section of the Simple Average Corridor continues following U.S. Highway 221 in Lanier County. The corridor crosses the Alapaha River adjacent to the highway until reaching the North Lakeland Tap 115 kV Transmission Line. This section of line is approximately 3.6 miles in length.

The total length of the Simple Average Corridor is 37.4 miles. It crosses through portions of Coffee, Atkinson, and Lanier Counties. **Figure 52.**

Figure 52 –Simple Average Corridor



E. Additional Corridors

After review of the alternate corridors produced by the Siting Methodology and field visits to the area, two additional corridors utilizing existing linear facilities were identified as additional alternate corridor segments. Title 22 (O.C.G.A 22-3-161(a)) requires GTC to examine five items when selecting the route for a new transmission line; one of which being existing corridors. Other items include existing land uses, existing environmental conditions, engineering practices, and cost. **Figure 53.**

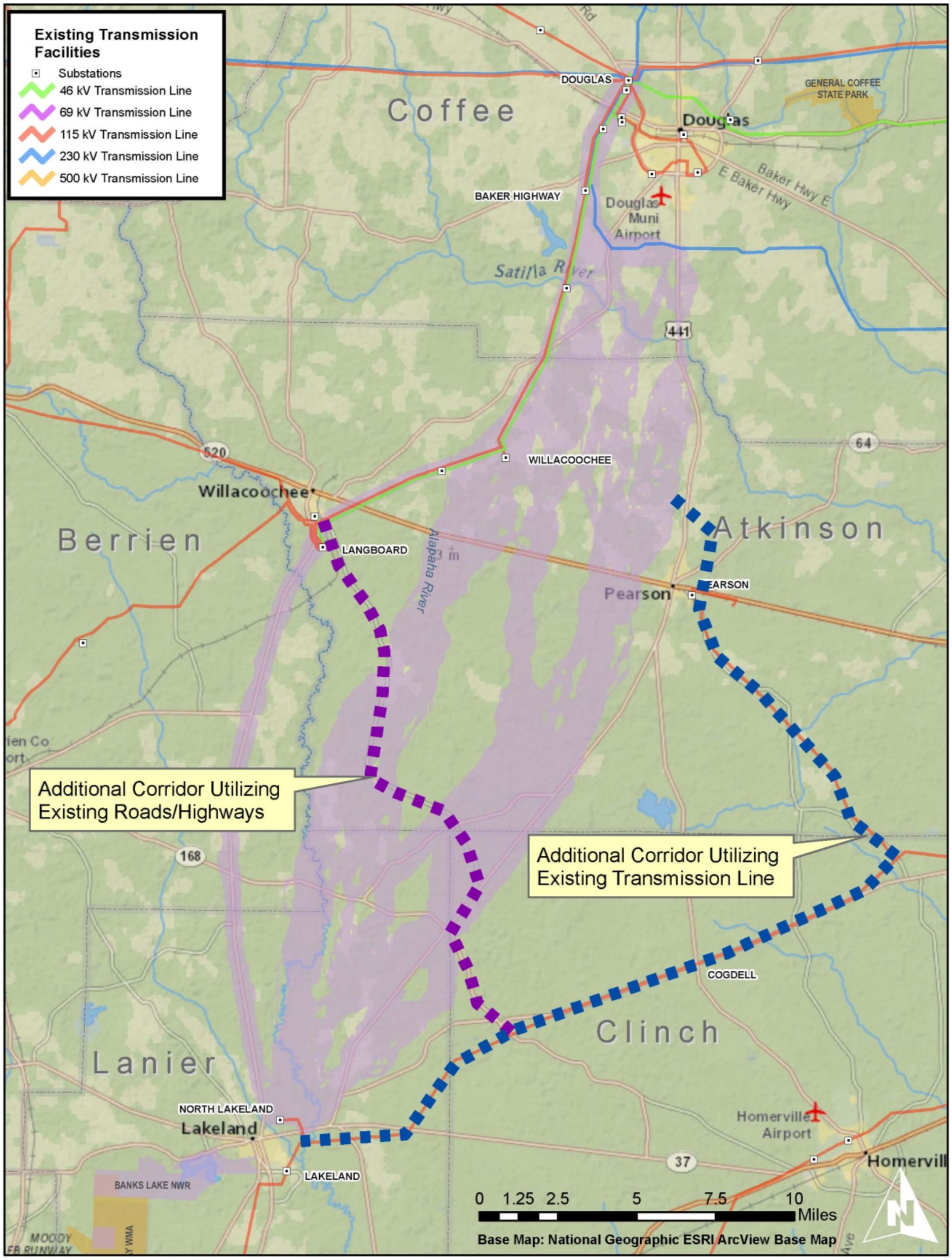
The first additional segment identified utilizes Springhead Church Road from the existing transmission line corridor on the southeast side of the City of Willachoochee. The corridor continues down the road until reaching State Highway 64. The alternate corridor segment continues along the same trajectory with a private woods road until reaching U.S. Highway 221 in Clinch County. This section is 14.1 miles. It is extremely rural with forest and agricultural land use.

The corridor turns down U.S. Highway 221 for 1.8 miles and then turns back along State Route 168 traveling in a south-southeastward direction for 4.1 miles until reaching the existing Pine Grove – Kettle Creek 115 kV Transmission Line. The corridor then travels southwestward toward Lakeland to the North Lakeland Tap 115 kV Transmission Line.

This additional corridor segment is approximately 20 miles long. Combined with the northern half of the Engineering Corridor, the total length of the corridor is 39.2 miles. It passes through portions of Coffee, Atkinson, Clinch, and Lanier Counties.

The second additional segment identified utilizes 32 miles of the Pine Grove – Kettle Creek 115kV Transmission Line including the tap to the existing Pearson Substation. Combined with the portion of the Natural Environment Corridor north of the City of Pearson, the total length is 52.6 miles. Although this corridor is much longer in length than the others (12 – 15 miles), it utilizes more existing transmission line easements. It passes through portions of Coffee, Atkinson, Clinch, and Lanier Counties.

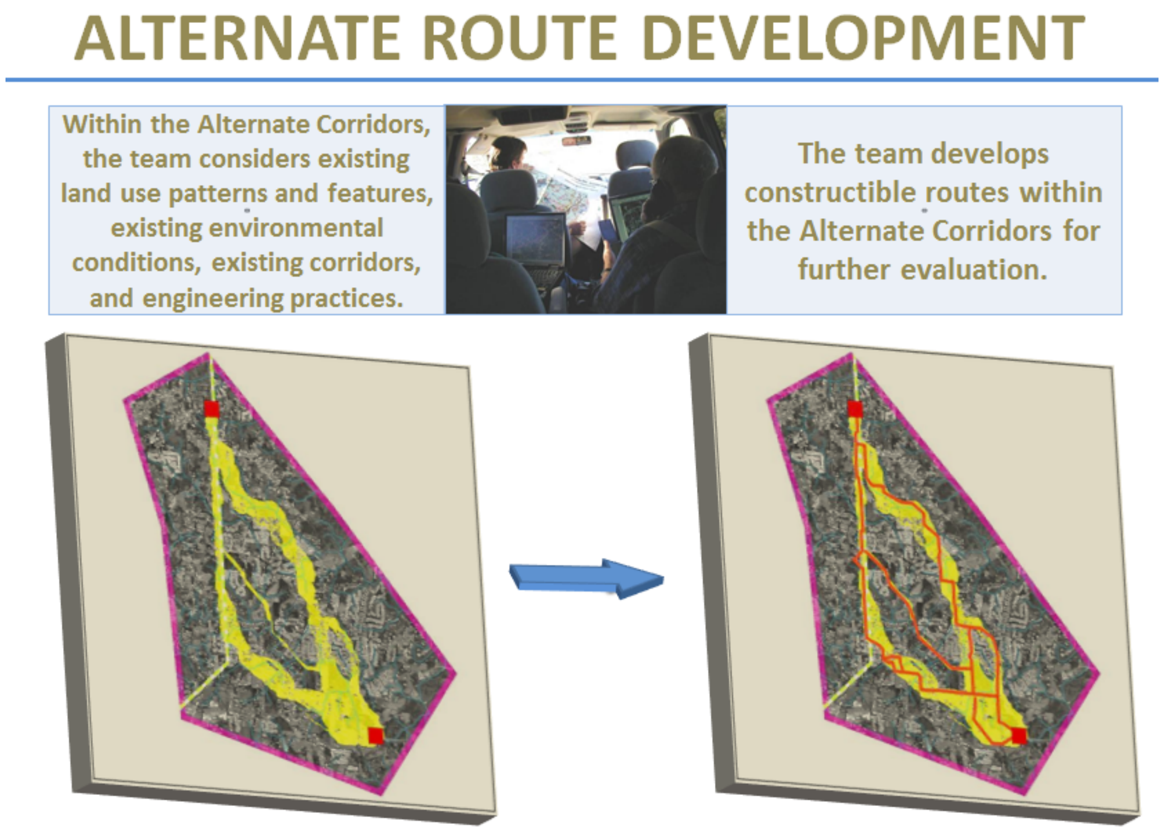
Figure 53–Additional Corridors



VII. Next Steps

A GTC siting team will use the corridors identified in this report as a guide to develop reasonable alternate routes for the transmission line project with field verification of data and information gathered from RUS's scoping meetings. **Figure 54.** After the RUS scoping meetings, a Scoping Report will be prepared and posted to the RUS website for public viewing.

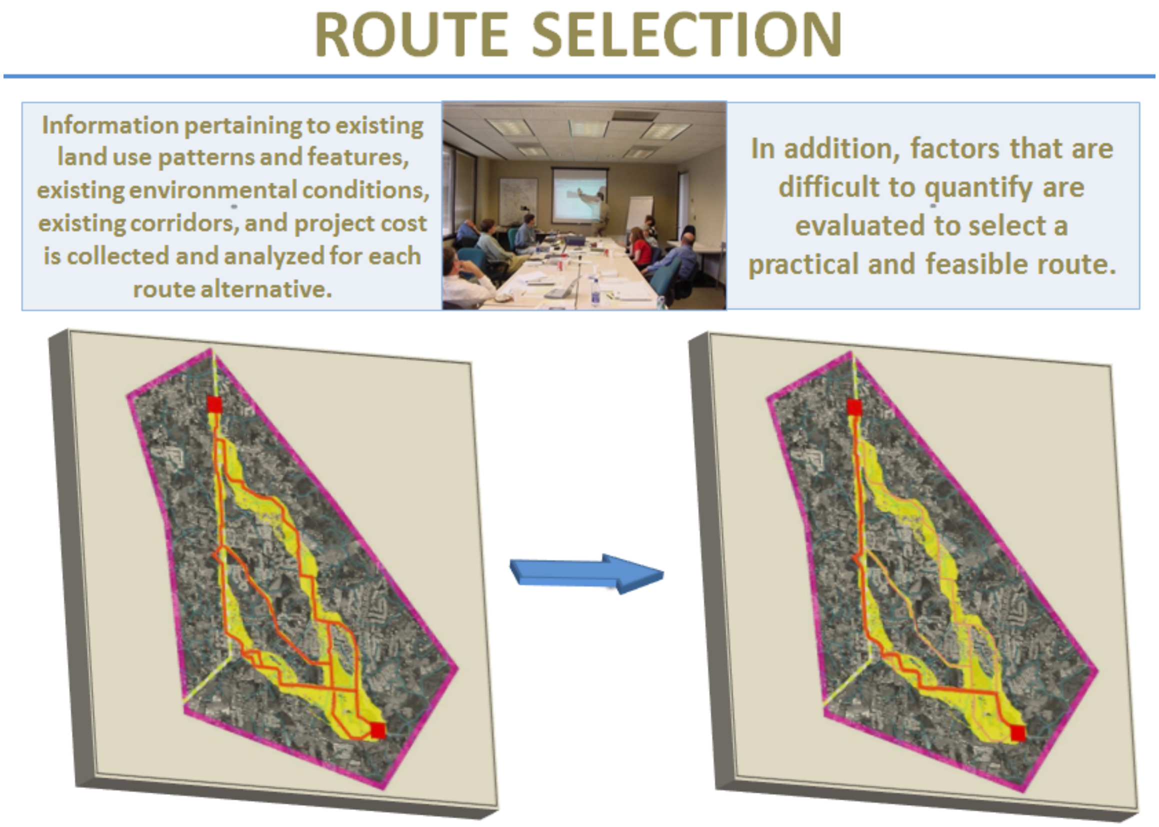
Figure 54–Alternate Route Development Illustration



The information depicted in this illustration is only for demonstration and not specific to the subject project.

A preferred route will be selected from the array of alternatives after further evaluation and comparison. **Figure 55.**

Figure 55–Route Selection Illustration



The information depicted in this illustration is only for demonstration and not specific to the subject project.

Once survey permissions have been granted along proposed preferred route, surveys will be conducted for terrain, planimetrics, property rights, existing utilities, and sensitive environmental and cultural resources. GTC will hold additional public information meetings in the project area to communicate information regarding the preferred route and the acquisition and construction process to affected land owners and the community. GTC will also gather and evaluate additional public comments.

After surveys are completed and information has been evaluated, GTC will prepare an environmental report (ER) and submit it to RUS for review. The ER will address route alternatives, preferred route selection, and environmental impacts of the proposed action. RUS will complete an independent analysis of the ER and once found acceptable will adopt the document as the agency's EA for the proposed project. The public and other agencies will be informed of the availability of the EA for comment via local newspaper and *Federal Register* notices. After conclusion of the comment period, RUS will evaluate comments and determine if additional analyses are needed, if an Environmental Impact Statement (EIS) is needed, or if a Finding of No Significant Impact (FONSI) can be issued. RUS will inform the public of its environmental decision via local newspaper and *Federal Register* notices.

GTC would acquire all applicable permits prior to project construction. The following list provides a summary of all applicable permits and consultations that must occur prior to project construction. **Table 24.**

Table 24: Environmental Statues & Requirements

Environmental Statues and Requirements
Clean Water Act (Fed. Water Pollution Control Act), 33 U.S.C. 1251, et seq.
Endangered Species Act, 16 U.S.C. 1531, et seq.
Fish and Wildlife Coordination Act, 16 U.S.C. 661, et seq.
National Environmental Policy Act, 42 U.S.C. 4321, et seq.
National Historic Preservation Act of 1966, as amended, 16 U.S.C. 470
Rivers and Harbors Act, 33 U.S.C. 403, et seq.
Wild and Scenic River Act, 16 U.S.C. 1271, et seq.
Farmland Protection Policy Act, 7 U.S.C. 4201, et. seq.
Floodplain Management (Executive Order 11988)
Protection of the Wetlands (Executive Order 11990)
Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations
Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970

VIII. References

"EPRI-GTC Overhead Electric Transmission Line Siting Methodology," Electric Power Research Institute & Georgia Transmission Corp., February 2006

"South Georgia Area Study" – Georgia Transmission Corporation, February 2012 (Contains Confidential Information)

"Phase I Historic Resources Survey for the Douglas – Lakeland 230 kV Transmission Line, Coffee County, Georgia," New South Associates, Inc., June 1, 2012

"Phase I Historic Resources Survey for the Douglas – Lakeland 230 kV Transmission Line, Berrien, Clinch, and Lanier Counties, Georgia," New South Associates, Inc., June 1, 2012

"Historic Resource Survey Report, Willacoochee and Pearson, Georgia," The University of Georgia, College of Environment and Design, Center for Community Design & Preservation, April 2012

"Historic Resource Survey Report, Atkinson County, Georgia," The University of Georgia, College of Environment and Design, Center for Community Design & Preservation, April 2012

"Douglas – Pine Grove Transmission Line, Environmental Justice Report," Linear Projects, Inc., April 2012

"GeorgiaInfo: http://georgiainfo.galileo.usg.edu/welcome.htm", GALILEO (Georgia Library Learning Online) and the University of Georgia Libraries

"Environmental Criteria for Electrical Transmission System," U.S. Department of the Interior, Bureau of Land Management, and U.S. Department of Agriculture – Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 1970.

Review of the reported information on the GNHP website (http://www.dnr.state.ga.us/dnr/wild/) indicates that there are known locations of listed or tracked species within the USGS quarter quadrangles that the project is within.

The U.S. Fish and Wildlife Service (USFWS) website (http://athens.fws.gov) was used regarding the potential occurrence of protected species. The county index of Endangered Species provided the most current list of the county in which the project is located.

IX. GIS Data Sources

Table 25: GIS Data Sources

Map Feature	Source Data	Source Agency/Organization	Additional Analysis
Engineering Perspective Criteria			
Linear Infrastrucure Map Layer			
Map Feature	Source Data	Source Agency/Organization	Additional Analysis
Rebuild Existing Transmission Lines	ITS Electrcial Grid	Georgia Power Company Georgia Transmission Corporation	GTC Electrical Planning
Parallel Existing Transmission Lines	ITS Electrcial Grid	Georgia Power Company Georgia Transmission Corporation	
Parallel Gas Pipelines	GDOT County Road Maps Transmission Pipelines	Georgia Department of Transporation (GDOT) PennWell, Inc.	
Parallel Roads	Public Right-of-Ways GDOT County Road Maps	Atkinson, Berrien, Clinch, Coffee, and Lanier Tax Assessors & GDOT	
Parallel Interstates	Public Right-of-Ways GDOT County Road Maps	Atkinson, Berrien, Clinch, Coffee, and Lanier Tax Assessors & GDOT	
Parallel Railways	Public Right-of-Ways GDOT Railway Map	Atkinson, Berrien, Clinch, Coffee, and Lanier Tax Assessors & GDOT	
Road Right-of-Ways	Public Right-of-Ways GDOT County Road Maps	Atkinson, Berrien, Clinch, Coffee, and Lanier Tax Assessors & GDOT	
Future GDOT Plans	GeoTRAQS - http://www.dot.state.ga.us/maps/geotraqs/Pages/default.aspx	GDOT	
Scenic Highways	Georgia Scenic Byway	GDOT	
Slope Map Layer			
Map Feature	Source Data	Source Agency/Organization	Additional Analysis
Slope Classes (0-15%, 15-30%, 30%+)	7.5 Minute Digital Elevation Models (DEM)	United States Geological Survey	Slope Algorithim - ESRI ArcGIS©
Intensive Agrcriculture Map Layer			
Map Feature	Source Data	Source Agency/Organization	Additional Analysis
Center Pivot Irrigation	Aerial Photography	Photo Science, Inc.	Digitized with ESRI ArcGIS©
Pecan Orchards	Aerial Photography	Photo Science, Inc.	Digitized with ESRI ArcGIS©
Fruit Orchards	Aerial Photography	Photo Science, Inc.	Digitized with ESRI ArcGIS©
Natural Environment Criteia			
Public Lands Map Layer			
Map Feature	Source Data	Source Agency/Organization	Additional Analysis
U.S. Forest Service (USFS) Lands	USFS Lands	USFS	
Wildlife Management Areas - State Owned	GDNR State Lands	Georgia Department of Natural Resources	
Wildlife Management Areas - State Managed	GDNR State Lands	Georgia Department of Natural Resources	
Other Conservation Land	Other State Owned Lands Conservation Easements USACE Lands	Georgia GIS Clearinghouse: Various Agencies/ Organizations	
Streams/Wetlands Map Layer			
Map Feature	Source Data	Source Agency/Organization	Additional Analysis
Trout Streams	USGS Blueline Streams	United States Geological Survey Georiga Department of Natural Resources	Analyzed with ESRI ArcGIS©
Streams < 5cfs	USGS Blueline Streams 7.5 Minute DEM	United States Geological Survey	Analyzed with ESRI ArcGIS©
River/Streams/Lakes > 5cfs	USGS Blueline Streams 7.5 Minute DEM	United States Geological Survey	Analyzed with ESRI ArcGIS©
Forested Wetlands	National Weltands Inventory Aerial Photography	U.S. Fish & Wildlife Service Photo Science, Inc.	Digitized & Analyzed with ESRI ArcGIS©
Non-Forested Wetlands	National Weltands Inventory Aerial Photography	U.S. Fish & Wildlife Service Photo Science, Inc.	Digitized & Analyzed with ESRI ArcGIS©
Salt Marsh	National Weltands Inventory	U.S. Fish & Wildlife Service	
Floodplain Map Layer			
Map Feature	Source Data	Source Agency/Organization	Additional Analysis
100 Year Floodplain	Firm Insurance Rate Maps	Federal Emergency Management Agency	
Land Cover Map Layer			
Map Feature	Source Data	Source Agency/Organization	Additional Analysis
Natural Forests	Aerial Photography	Photo Science, Inc.	Digitized with ESRI ArcGIS©
Open Land (Pastures, Clear Cut)	Aerial Photography	Photo Science, Inc.	Digitized with ESRI ArcGIS©
Row Crops/Horticulture	Aerial Photography	Photo Science, Inc.	Digitized with ESRI ArcGIS©
Managed Pines	Aerial Photography	Photo Science, Inc.	Digitized with ESRI ArcGIS©
Developed Land	Aerial Photography	Photo Science, Inc.	Digitized with ESRI ArcGIS©

Wildlife Habitat Map Layer			
Map Feature	**Source Data**	**Source Agency/Organization**	**Additional Analysis**
Conservation Opportunity Areas	Potential Conservation Opportunity AreasMap	Univeristy of Georiga, Natural Resources Spatial Analysis Laboratory	
High Priorty Waters	High Priorty Waters Map	Georgia Department of Natural Resources	
Built Environment Criteia			
Eligible NRHP Resource Map Layer			
Map Feature	**Source Data**	**Source Agency/Organization**	**Additional Analysis**
Eligbile NRHP Resources	Historic Phase I Surveys	New South and Associates, Inc. Univeristy of Georiga, Fine It! Program	
Building Density Map Layer			
Map Feature	**Source Data**	**Source Agency/Organization**	**Additional Analysis**
Building Density Classes (< 1 bldg/20ac, 1 bldg/5-20ac, 1 bldg 1-5ac, 1 bldg/0.25-1ac, >1bldg/0.25ac	Aerial Photography	Photo Science, Inc.	Digitized buildings with ESRI ArcGIS© Density Algorithim - ESRI ArcGIS©
Building Proximity Map Layer			
Map Feature	**Source Data**	**Source Agency/Organization**	**Additional Analysis**
Building Proximity Classes (0-300', 300-600', 600-900', 900-1200', 1200'+)	Aerial Photography	Photo Science, Inc.	Digitized buildings with ESRI ArcGIS© Distance Algorithim - ESRI ArcGIS©
Spannable Lakes and Ponds Map Layer			
Map Feature	**Source Data**	**Source Agency/Organization**	**Additional Analysis**
Spannable Lakes and Ponds	USGS Waterbodies USGS 7.5 min Quadrangles	United States Geological Survey	Analyzed with ESRI ArcGIS©
Proposed Developments Map Layer			
Map Feature	**Source Data**	**Source Agency/Organization**	**Additional Analysis**
Proposed Developments	Atkinson, Berrien, Clinch, Coffee, and Lanier Tax Assessor Maps	Atkinson, Berrien, Clinch, Coffee, and Lanier Counties	Digitized with ESRI ArcGIS©
Major Propety Lines Map Layer			
Map Feature	**Source Data**	**Source Agency/Organization**	**Additional Analysis**
Edge of Field	Aerial Photography/LULC	Photo Science, Inc.	
Land Lots	Atkinson, Berrien, Clinch, Coffee, and Lanier Tax Assessor Maps	Atkinson, Berrien, Clinch, Coffee, and Lanier Counties	
Land Use Map Layer			
Map Feature	**Source Data**	**Source Agency/Organization**	**Additional Analysis**
Undeveloped	Aerial Photography	Photo Science, Inc.	Digitized with ESRI ArcGIS©
Residential Development	Aerial Photography	Photo Science, Inc.	Digitized with ESRI ArcGIS©
Commercial/Industrial Development	Aerial Photography	Photo Science, Inc.	Digitized with ESRI ArcGIS©
Areas of Least Preference			
Map Feature	**Source Data**	**Source Agency/Organization**	**Additional Analysis**
NRHP Listed Archeology Districts and Sites	National Registrer of Historic Places Georgia Archaeological Site Files	National Park Service Univeristy of Georgia	
NRHP Listed Districts and Structures	National Registrer of Historic Places NAHRGIS	National Park Service Univeristy of Georgia	
Eligible NRHP Districts	Historic Phase I Surveys	New South and Associates, Inc. Univeristy of Georiga, Fine It! Program	
Buildings	Aerial Photography	Photo Science, Inc.	Digitized with ESRI ArcGIS©
Airports	FAA Charts GDOT County Road Maps	Federal Aviation Administration Georgia Department of Transporation	
Superfund Sites	Comprehensive Environmental Response, Compenstion, and Liability Information System (CERCLIS)	U.S. Environmental Protection Agency	
Non-Spannable Lakes and Ponds	USGS Waterbodies USGS 7.5 min Quadrangles	United States Geological Survey	Analyzed with ESRI ArcGIS©
State Parks	GDNR State Lands	Georgia Department of Natural Resources	
National Parks	Federal Lands Map	National Atlas National Park Service	
Military Facilities	Federal Lands Map	National Atlas Deparment of Defense	
Mines, Quarries, Landfills	Aerial Photography	Photo Science, Inc.	Digitized with ESRI ArcGIS©
City and County Parks	Tax Assessor Maps USGS 7.5 Min Quadrangles	Atkinson, Berrien, Clinch, Coffee, and Lanier Counties, USGS	

Day Care Parcel	Tax Assessor Maps USGS 7.5 Min Quadrangles	Atkinson, Berrien, Clinch, Coffee, and Lanier Counties, USGS	
Cemetery Parcel	Tax Assessor Maps USGS 7.5 Min Quadrangles	Atkinson, Berrien, Clinch, Coffee, and Lanier Counties, USGS	
School Parcel	Tax Assessor Maps USGS 7.5 Min Quadrangles	Atkinson, Berrien, Clinch, Coffee, and Lanier Counties, USGS	
Church Parcel	Tax Assessor Maps USGS 7.5 Min Quadrangles	Atkinson, Berrien, Clinch, Coffee, and Lanier Counties, USGS	
Wilderness Areas	USFS Lands Map	U.S. Forest Service	
Wild & Scenic Rivers	Wild and Scenic Rivers Map	Bureau of Land Management	
Areas of Ritual Importance	N/A	N/A	
Wildlife Refgure	Federal Lands Map	National Atlas U.S. Fish & Wildlife Service	
Additional GIS Layers Used in the Report			
Map Feature	**Source Data**	**Source Agency/Organization**	**Additional Analysis**
Georgia Physiographic Regions	Geologic Map of Georgia	Georgia Geological Survey	
Georgia Digital Elevation Model	7.5 Minue DEMs	U.S. Geological Survey	Merged with ESRI ArcGIS©
Prime Farmland Soils & Soils of Statewide Importance	Soil Data Mart	Natuarl Resources Conservation Service, USDA	
30 meter Land Use/Land Cover	2008 LandSat 5 TM and LandSat 7 TM images	National Aeronatics and Space Adminsitration National Oceanic and Atmospheric Adminstration	LULC created by UGA Updated by MDA Federal
Low Income Areas	Census Bureau Block Groups	U.S. Census Bureau	Analyzed by Linear Projects, Inc.
Minoroty Areas	Census Bureau Blocks	U.S. Census Bureau	Analyzed by Linear Projects, Inc.
Population Change	Counties & Cities	U.S. Census Bureau	