

2. Study Area Guiding Principles

The recommended study area is intended to meet the purpose and need of the project and minimize impacts to the social, cultural, natural and physical environment.

A study area is a large area that is wide enough to contain several options for transportation improvements. The following “Guiding Principles” were used to identify the general study area within which a range of alternatives would be evaluated:

- Follows, where feasible, existing road alignments through environmentally sensitive areas;
- Minimizes direct impacts to wetlands;
- Minimizes impacts on springshed and ground water recharge areas;
- Serves an identified long-term regional transportation need;
- Attempts to improve the connectivity of existing wildlife areas;
- Relieves or removes traffic demands on SR 46 and provides a North-South connection from SR 46 to US 441 with limited interchanges;
- Minimizes impacts to habitat and species;
- Avoids, or mitigates if required, impacts on conservation lands and their proper management;
- Seeks to minimize impacts on existing neighborhoods and residential communities; and,
- Does not encourage or promote additional development from already approved land uses.

3. Composite Constraint Mapping

The major features from the social, cultural, and natural environmental constraints were layered together to create a composite area map showing the major constraints and areas of concern (see **Exhibit G-5**). Areas without major constraints represent the most reasonable areas for alternatives development. These areas have fewer environmental constraints compared to other locations.

Exhibit G-5 illustrates the specific areas and resources that are unique to this region and the Wekiva River Basin ecosystem:

- public parks, conservation and recreations areas (potential Section 4(f) involvement),
- archaeological and historic sites (potential Section 106 and Section 4(f) involvement),
- threatened and endangered species habitat (potential Section 7 involvement),
- wetlands,
- floodplains,
- neighborhoods and developing communities, and
- extensive critical recharge areas and springsheds.

Based on the extensive coordination and evaluations that were performed, the Wekiva Parkway study area, as shown in Exhibit G-5, was recommended for further analysis in the next step of the alternatives development process. *The Wekiva Parkway study area represents the location that best meets the purpose and need of the proposed project while minimizing impacts to the environment.*

The existing SR 46 area is located within an area of higher ground within the WRPA. The area west of the WRPA is on an upland ridge between several large lakes to the west and the WRPA to the east. The sandy soils of this upland area provide critical recharge to the Wekiva springshed.

The 100-year floodplain areas are located mainly within the wetland areas shown in Exhibit G-4. The floodplains of the Wekiva River, the St. Johns River, and Yankee Lake north of SR 46, are interconnected. Natural lands in the region between the rivers include Lower Wekiva Preserve State Park, Seminole County's Yankee Lake Regional Wastewater Treatment Facility and Black Bear Wilderness Area, and lands of the St. Johns River Water Management District. The historical connection with Sylvan Lake, south of SR 46, is maintained by cross drains.

A desktop review of GIS databases and Strategic Habitat Conservation Areas was conducted for potential threatened and endangered species occurrences and species habitat within the study area. These sites, as shown on Exhibit G-4, of approximate locations of threatened and endangered species occurrences are primarily near the conservation lands. An Endangered Species Biological Assessment was prepared as part of the PD&E study.

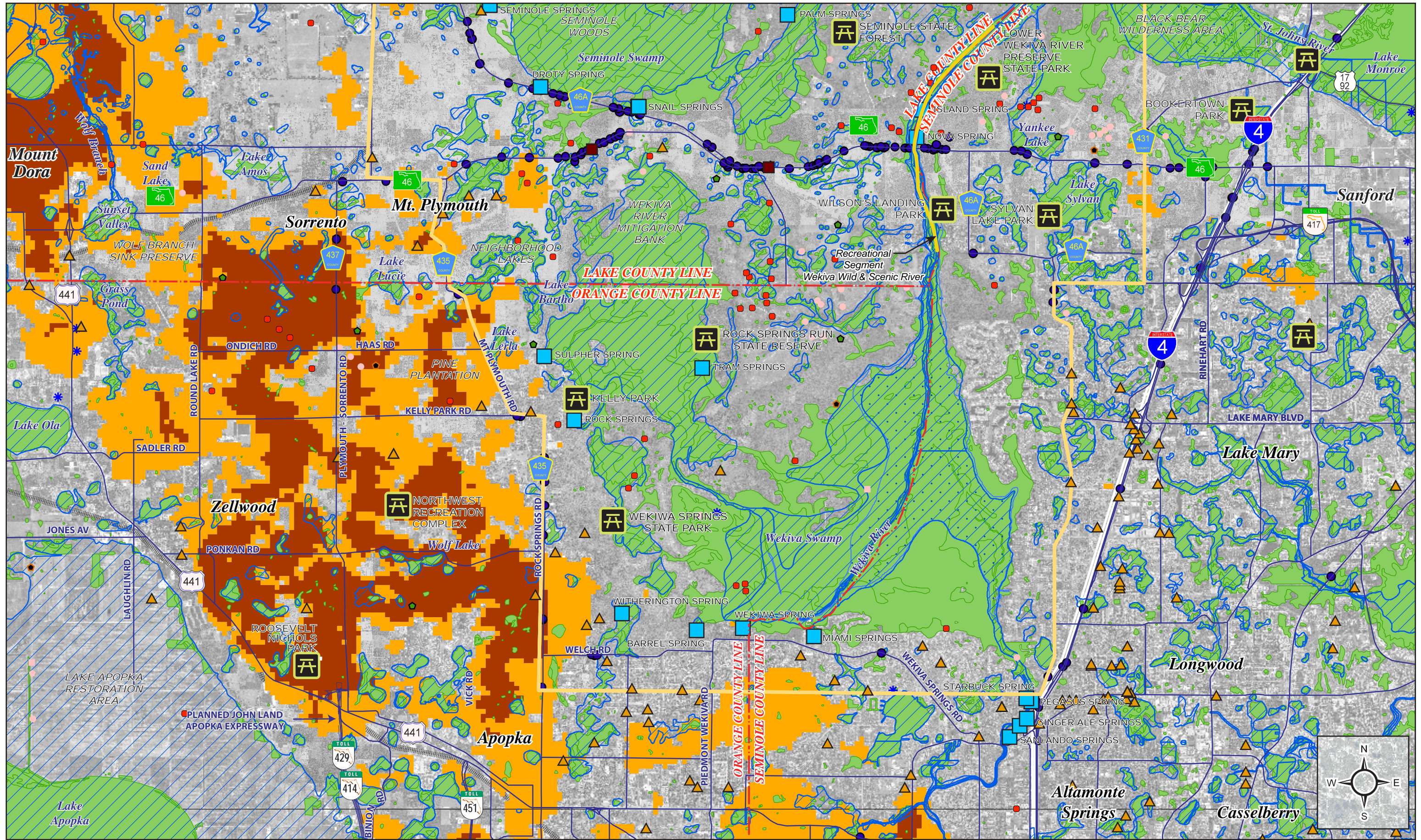
1.4. Physical Environment

The primary physical constraints include utilities, railroads, and potential contamination sites. Major utilities within the study area include natural gas transmission lines, overhead electric transmission lines, the Plymouth Regional Water Plant, and Seminole County's Yankee Lake Regional Wastewater Treatment Facility.

Florida Gas Transmission has 24 inch and 26 inch gas transmission lines that generally run from northwest to southeast within an easement west of and adjacent to Mt. Plymouth Road (CR 435). Overhead electric and cable lines are also located within the easement. 12 inch and 26 inch gas transmission lines run parallel to SR 46 from Mount Plymouth to west of Orange Boulevard in Seminole County. The gas transmission lines then turn to the north within a Progress Energy electric transmission line easement and continue across the St. Johns River into Volusia County.

There are two railroad lines within the study area. An inactive railroad line owned by CSX and leased by Florida Central Railroad is located in west Lake County. Many sections of the former railroad area that extended north of the current terminus have been sold. An active railroad line owned and operated by CSX is located in the vicinity of US 17-92 in the northeastern portion of the study area. The railroad crosses the St. Johns River west of the I-4 bridge over the river.

Many potential contamination sites were identified in the study area, none of which were identified as major constraints. As part of the Contamination Screening Evaluation Report prepared for this PD&E study, various agricultural sites were analyzed further to determine if any residual pesticide or herbicides in soils are a concern for potential contamination.



LEGEND	Aquatic Preserve	Springs/Seepage	Bald Eagle	Wekiva River Protection Area
Black Bear Road Kill	Floodplain	Wildlife Crossing	Black Bear Observed	Recharge Rate 12-20 in/yr
Gopher Tortoise	Wetland	Sinkhole	Threatened and Endangered Species	Recharge Rate > 20 in/yr

Exhibit G-4
Natural Environment

Potential Section 4(f) Resources

Potential Section 4(f) resources are defined as public park and recreation lands, wildlife and waterfowl refuges, and historic/archaeological sites of significance protected under Section 4(f) of the U.S. Department of Transportation Act (USDOT) of 1966 [Title 49, USC, Section 303] and [Title 23, USC, Section 138]; as amended. Impacts to Section 4(f) resources must be avoided unless there is no feasible and prudent avoidance alternative to use of land and all possible planning to minimize harm is implemented or there is a *de minimus* impact on the property. The applicability of eligible Section 4(f) resources is determined by FHWA.

Environmental resources such as public parks and recreational facilities, public conservation lands and NRHP eligible historic and archaeological resources may be determined to be eligible Section 4(f) resources. Potential Section 4(f) resources within the study area include the following existing public conservation lands:

- Kelly Park/Rock Springs
- Northwest Recreation Complex/Apopka Little League
- Roosevelt Nichols Park
- Wekiwa Springs State Park
- Rock Springs Run State Reserve
- Seminole State Forest
- Lower Wekiva River Preserve State Park
- Wilson's Landing
- Lake Sylvan Park
- Black Bear Wilderness Area
- Bookertown Park
- Wekiva Wild & Scenic River
- Wekiva River Aquatic Preserve
- St. Johns River Aquatic Preserve

Planned public park and recreation lands, wildlife and waterfowl refuges, and newly identified historic/archaeological sites may also be determined eligible Section 4(f) resources if they are considered significant. Changes in public ownership and land uses for these types of planned developments were monitored during the PD&E Study to determine potential Section 4(f) applicability.

1.3. Natural Environment

The natural environment constraints include numerous lakes, floodplains, wetlands, the Wekiva River Basin ecosystem and springshed, public conservation lands, numerous karst features including sinkholes and springs, and a natural wildlife area that connects to the Ocala National Forest. The natural environment resources within the study area are illustrated on **Exhibit G-4**. Given the preponderance of springs in the Wekiva basin, special considerations were given to the high recharge areas primarily in Northwest Orange County recognizing the recharge areas are an integral component to the area springshed and the ultimate continued function of the spring systems. The critical area of recharge is shown in Exhibit G-4 in red and orange.

Wekiva River and its tributaries of Rock Springs Run, Seminole Creek, and Black Water Creek are included in the designations of the Wekiva River Aquatic Preserve, Outstanding Florida Water, and State and National Wild & Scenic River. Several springs and seepage springs are located within the study area, particularly along the western boundary of the WRPA. Wolf Branch Sink in Lake County is a unique geologic feature known as a “stream to sinkhole” system with a direct connection to the Floridan Aquifer.