

The Wekiva River is a designated National Wild and Scenic River and is protected as a Section 4(f) resource. *Section 4.3.10* discusses the potential impacts to the Wekiva Wild and Scenic River.

4.3 Natural and Physical Impacts

4.3.1 Pedestrian/Bicycle Facilities

The following is a discussion of existing and proposed pedestrian/bicycle facilities (i.e., sidewalks, bikeways, trails and greenways) within the project study area. These facilities are categorized by use. Bikeway facilities include bike lanes, bike routes, and/or paved shoulders. Trail facilities include paved and unpaved multi-use trails. Greenway facilities are corridors of protected open space that are managed for conservation and/or recreation.

The Wekiva Parkway is proposed as a limited access facility. Florida Statutes (Section 316.091 (2)) prohibit pedestrians and bicycles on limited access facilities. As interpreted by FDOT's Deputy General Counsel, the construction of bicycle and pedestrian paths and trails are not prohibited along limited access highways as long as the pedestrians and bicyclists (and other users) do not use or enter upon the ramps or roadway surfaces. FDOT, District Five has indicated trails will not be allowed within the limited access right-of-way unless there are no other alternatives.

The urban typical sections for the SR 46 Reconstruction in Lake County West and the frontage roads along the Wekiva Parkway (SR 429) in Seminole County will include paved shoulders and sidewalks as discussed below.

Sidewalks and Bikeways

The majority of the roadways within the study area were constructed prior to current design standards and do not include pedestrian and/or sidewalk facilities. Newer subdivisions, built since changes in land development codes requiring sidewalks were enacted, have sidewalks on both sides of the streets.

Sidewalks within the study area are located in Seminole County along the south side of SR 46 in front of Estates at Wekiva Park, along Longwood Markham Road, along the entrance road to Lake Forest subdivision and along the north side of SR 46 in front of the Lake Forest Village Shops. Seminole County will use \$350,000 in grants through FY 2011/2012 to pay for design and construction of a sidewalk from Wilson Elementary School to International Parkway (FM No. 425823). Any existing sidewalks impacted by the Proposed Build Alternative will be reconstructed as part of the proposed improvements.

According to METROPLAN ORLANDO's Existing, Funded & Prioritized Bicycle & Pedestrian Projects, the paved shoulders along SR 46 in Seminole County constitute bicycle and pedestrian facilities. The proposed project will impact the existing paved shoulder along portions of SR 46 in Seminole County. In compliance with Section 109(m) of 23 USC, the proposed project along SR 46 will provide bicyclists a reasonable alternative to the existing facility. Sidewalks and undesignated bicycle lanes are included in the SR 46 urban controlled access typical section proposed for the project. Four-foot paved shoulders that can be utilized by bicyclists are provided on the urban typical section for SR 46 in Lake and Seminole Counties. Sidewalks for pedestrians are also provided in the SR 46 proposed typical section. In Lake County West, the proposed sidewalks are five feet wide. In Seminole County, the frontage roads will have five-foot sidewalks on the north side of the Wekiva

Parkway and ten-foot sidewalks on the south side. The proposed CR 46A Realignment rural controlled access typical section includes five feet of shoulder pavement within the 12-foot outside shoulders that will accommodate bicyclists. No sidewalks are proposed for this rural roadway.

Existing Trails

Numerous hiking, bicycling, horseback riding, and canoe trails are located within the state-owned public lands adjacent to the Wekiva Parkway study corridor. These lands include Wekiwa Springs State Park, Rock Springs Run State Reserve, Seminole State Forest, and Lower Wekiva Preserve State Park. These trails are included in the Florida National Trail system. The Florida National Scenic Trail generally follows the paths of other existing and planned trails. The Cassia section of the trail extends from Longwood to the Ocala National Forest. Within Seminole County, the trail runs west along the Seminole-Wekiva bicycle path from Markham Road, north along Lake Markham Road to SR 46. The trail crosses to the north side of SR 46, loops into the Lower Wekiva Preserve State Park and then crosses into Lake County at the Wekiva River bridge. From there the trail enters the Seminole State Forest to SR 44. Loops and side trails of the Florida National Scenic Trail are located in Wekiwa Springs State Park and Rock Springs Run State Reserve. No impacts to the Florida National Scenic Trail are anticipated as a result of this project. In the area of the Wekiva River, where the proposed project interfaces with the route of the trail, continuity will be provided along the proposed service and frontage road sidewalks. The proposed service road bridge over Wekiva River will accommodate a 10-foot barrier-separated trail crossing.

Wekiva Parkway (SR 429)/SR 46 Realignment PD&E Study Trail Assessment

As part of the Wekiva Parkway (SR 429)/SR 46 Realignment PD&E Study, an assessment of whether the proposed project could accommodate a multi-use trail was undertaken and completed. The purpose of the assessment was to identify and coordinate existing, planned, and proposed trails within the general study area of the Wekiva Parkway, and to develop concepts to indicate how trail continuity may be accomplished with the introduction of the Wekiva Parkway.

The trail is not to be located within the limited access areas of the Wekiva Parkway (SR 429); however, certain areas of reconstructed SR 46 in Lake County West and Seminole County offer provisions for sidewalks and a potential trail. Those areas include SR 46 from east of US 441 to east of Round Lake Road in Lake County, and from east of the Wekiva River to Lake Markham Road in Seminole County. Also, remnant portions of SR 46 in Lake County East may be usable for a trail.

Orange, Lake, and Seminole Counties have had long-range plans to interconnect their showcase multi-use trails within the project study area. The Wekiva Parkway trail assessment provided a forum for the counties and other stakeholders to meet and discuss future trail alignments. Subsequent to the initial coordination meeting, the counties reviewed the Proposed Build Alternative alignment concepts and developed trail alternatives. Those trail alternatives were overlaid with the proposed Wekiva Parkway alignment. From the maps, it was determined that there are four key locations along the Wekiva Parkway corridor where trail connectivity and continuity needs to be considered.

Those locations, as depicted on **Exhibit 4-11**, are as follows:

- US 441 near SR 46 – Lake County/Mount Dora
- SR 46 Bypass east of Round Lake Road – Lake County
- East of Mount Plymouth – Lake County
- Wekiva River Crossing – Lake and Seminole Counties

Basic concepts to establish the ability to provide connectivity at these key points where the proposed trails would interface with the Proposed Build Alternative alignment were developed in coordination with representatives of the affected local governments and other stakeholders. The results of the trail assessment indicate that the Proposed Build Alternative for the Wekiva Parkway (SR 429)/SR 46 Realignment can accommodate a multi-use trail, as documented in a final report entitled *Assessment of Multi-Use Trail Accommodation* (October 2008); however, it was the consensus opinion of the counties and other stakeholders at a second coordination meeting that a detailed trail study should be funded and undertaken to consider different types of trails to accommodate a range of users. Thereafter, FDOT undertook a separate Feasibility Study for evaluation of trail alternatives. Assessments of the potential trail locations and other design parameters are being developed and coordinated with the respective local governments and other stakeholders. This includes coordination with land owners and public land managers as appropriate. Costs for trail construction are not included in the Wekiva Parkway project cost estimate. However, the design concept for the Service Road bridge over the Wekiva River does provide additional width and a traffic separator to accommodate a trail.

Planned Trails

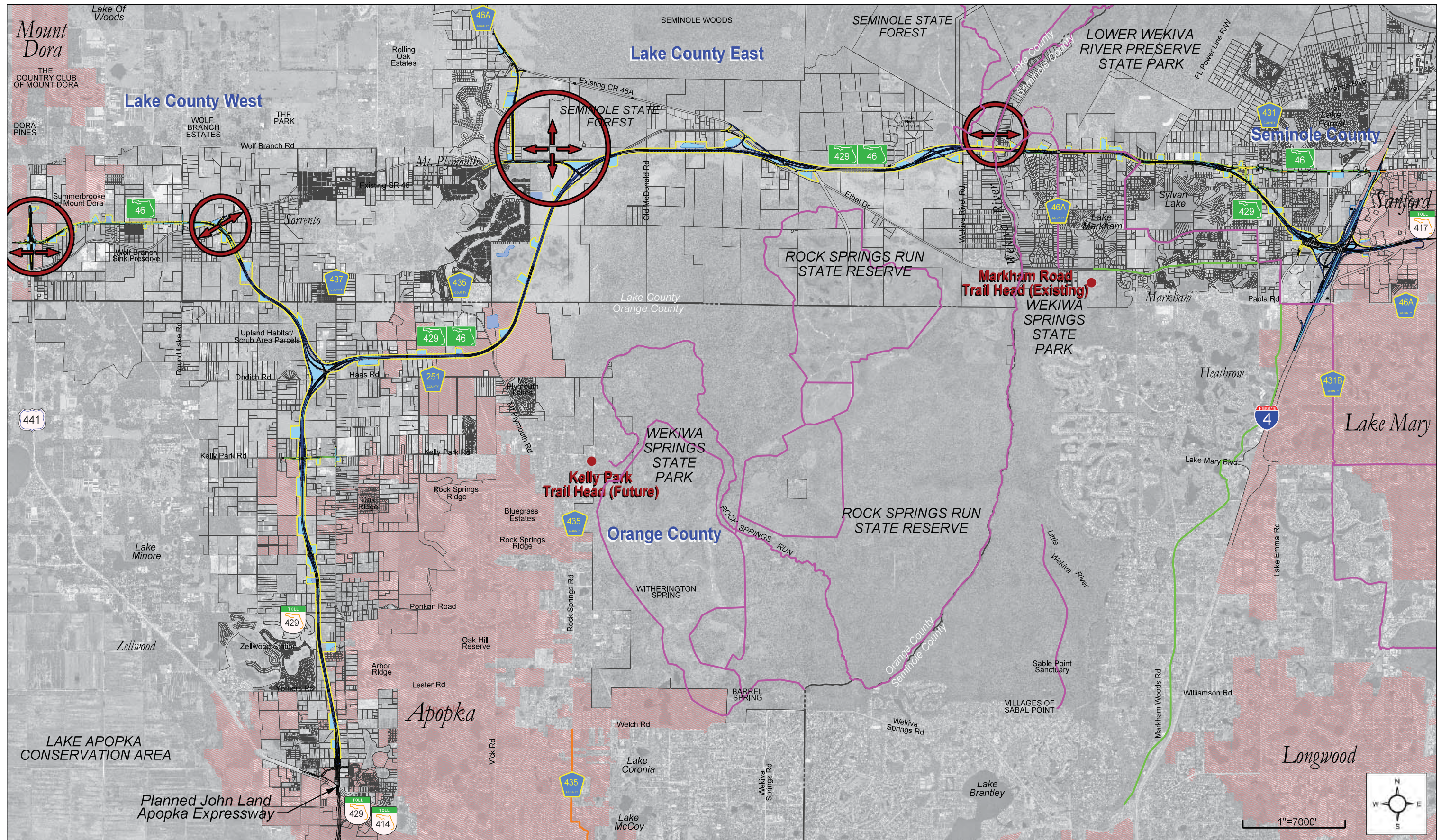
As a result of the Wekiva Parkway trail assessment, Orange, Lake, and Seminole Counties have coordinated regarding plans for a regional trail system. The Lake County Trails Master Plan (July 15, 2008) includes a preliminary alignment for the planned Lake-Wekiva Trail, along with potential connection points to the West Orange Trail and the Seminole-Wekiva Trail.

There are currently no existing multi-use trails within or adjacent to the Lake County portion of the study corridor. The planned 15-mile Lake-Wekiva Trail will connect with the Tav-Dora Trail in Mount Dora, the West Orange Trail in Orange County, and the Seminole-Wekiva Trail in Seminole County. The trail will utilize historic railroad grades, remnant sections of SR 46, roadway right-of-way, and other public lands.

Orange County's West Orange Trail currently terminates at Welch Road, approximately 3 miles east of the proposed Wekiva Parkway alignment. Phase I of the existing trail extends 5 miles from the Lake County line to Winter Garden; Phase II extends 14 miles to US 441 in Apopka; Phase III extends 2.7 miles to Welch Road. Phase IV of the trail will extend north to Kelly Park and east to Wekiwa Springs State Park. This phase of the project is currently unfunded. An extension of the planned trail, from Kelly Park north to SR 46 is shown in the Lake County Trails Master Plan.

The Seminole-Wekiva Trail in Seminole County is considered one of the County's four major trails, which also include the Cross Seminole Trail, the Flagler Trail, and the Florida National Scenic Trail, discussed above. The Seminole-Wekiva Trail currently extends from SR 436 in Altamonte Springs to the Markham Trailhead located on Markham Road, just west of Lake Markham Road. Plans to extend the trail south to connect with the West Orange Trail, and northwest along Lake Markham Road and SR 46 to the Wekiva River, are currently unfunded.

There are no programmed trails within the project study corridor at this time.



Wekiva-Ocala Greenway

Efforts to conserve a continuous natural corridor spanning from Wekiwa Springs State Park to the Ocala National Forest began in the 1960's. The State of Florida, as part of the Florida Forever project, has acquired approximately 65% of the tracts needed to complete the Wekiva-Ocala Greenway. Public conservation lands currently included in the Wekiva-Ocala Greenway include Wekiva River Buffer Conservation Area, Wekiwa Springs State Park, Rock Springs Run State Reserve, Lower Wekiva River Preserve State Park, Black Bear Wilderness Area, Hontoon Island State Recreation Area, and Blue Spring State Park.

The 2008 Florida Forever Five-Year Plan lists the essential tracts within the study area yet to be acquired as Seminole Springs/Woods, and a portion of Pine Plantation. The Wekiva Parkway (SR 429) study corridor crosses through portions of Pine Plantation, Neighborhood Lakes, Rock Springs Run State Reserve, Seminole State Forest, and Lower Wekiva River Preserve State Park. The acquisition of conservation property as previously referenced in *Section 4.2.2.1* further enhanced the Wekiva-Ocala Greenway.

4.3.2 Visual/Aesthetic

The Wekiva River Basin Area Task Force envisioned the Wekiva Parkway as similar to well known scenic highways, and included promoting “a ‘Parkway’ look with appropriate natural buffers between the roadway and the adjacent areas” in the “Guiding Principles”. FDOT and the Expressway Authority are committed to developing a landscape plan during the final design phase that will accentuate the natural environment. Consistent with the recommendations of the “Guiding Principles” to support the conservation of dark skies in the Wekiva River Protection Area, FDOT and the Expressway Authority will incorporate non-intrusive and minimal roadway and bridge lighting in the final design plans in appropriate areas for Wekiva Parkway.

4.3.3 Air

National Ambient Air Quality Standards (NAAQS) established for air pollutants have also been adopted as the ambient air quality standards for the State of Florida. An area may be designated as attainment/unclassifiable if monitored air quality data show that the area has not violated the standards over a 3-year period or if there is not enough information to determine air quality in the area. The proposed project is in the Central Florida Intrastate Air Quality Control Region, an area which has been designated as attainment for all the air quality standards under the criteria provided in the Clean Air Act Amendments of 1990; therefore, State Implementation Plan (SIP) conformity does not apply.

As required by the FDOT *PD&E Manual* for attainment areas, carbon monoxide (CO) screening tests were performed for the Proposed Build Alternative and the No Build scenario. As documented in the updated final *Air Quality Analysis Report* (CH2M HILL, June 2010), modeling was conducted for the Opening Year (2012) and Design Year (2032) No Build and Build Alternatives. The screening model, *CO Florida 2004*, uses the latest EPA-approved software (MOBILE 6 and CAL3QHC) to produce estimates of 1-hour and 8-hour vehicular CO emissions at default receptor locations. The model was utilized to perform screening tests for worst-case traffic locations to estimate the effects of the proposed improvements on local air quality conditions. The results of the *CO Florida 2004* screening test were compared to the NAAQS to determine if there was any potential for violation of the standards established for CO. The results of the analysis, as shown in **Table 4-7**, indicate the proposed improvements will not cause CO concentrations at or above the maximum

1-hour and 8-hour NAAQS. In fact, the comparative 1-hour and 8-hour CO concentrations are lower for the Build Alternative than for the No Build Alternative.

TABLE 4-7
Carbon Monoxide (CO) Screening Test Results

Intersection	Max 1-hour Concentration (ppm)	Max 8-hour Concentration (ppm)	1-hour CO NAAQS (ppm)	8-hour CO NAAQS (ppm)
2012 No-Build				
CR 46A and International Parkway	11.1	6.7	35	9
CR 46A and Rinehart Road	12.6	7.6	35	9
2032 No-Build				
CR 46A and International Parkway	11.1	6.7	35	9
CR 46A and Rinehart Road	11.8	7.1	35	9
2012 Build				
CR 46A and Rinehart Road	12.0	7.2	35	9
2032 Build				
CR 46A and International Parkway	10.4	6.2	35	9
CR 46A and Rinehart Road	11.2	6.7	35	9

4.3.4 Noise

A noise study report was prepared for the Wekiva Parkway (SR 429)/SR 46 Realignment PD&E Study in accordance with the requirements of 23 Code of Federal Regulations (CFR), Part 772 – *Procedures for Abatement of Highway Traffic Noise and Construction Noise* and Part 2, Chapter 17 of the FDOT's *PD&E Manual*. The updated final *Noise Study Report* (CH2MHILL, June 2010) documents the results of the existing conditions ambient noise analysis and the predicted future noise levels for the project study area. This section summarizes the methodology and results of the noise impact analysis performed for the Proposed Build Alternative.

Existing noise conditions throughout the project study area are generally driven by local vehicular traffic and, at some locations, distant traffic. Traffic along key arterials is the dominant source of noise for areas located along those roadways. SR 46 is a major source of noise due to its high traffic volume within the project study area. Other environmental noise sources contributing to the ambient noise environment include occasional distant aviation and commercial aircraft operations. Aircraft flights are not frequent enough to substantially contribute to background noise exposure.

Noise sensitive sites within the project corridor consist mostly of residential communities and several residential clusters. Noise level measurements were conducted at 43 locations within the project study area. Those monitoring locations are representative of noise sensitive sites adjacent to the proposed facility. The ambient noise monitoring locations are shown on **Exhibit 4-12**.

Future traffic noise levels for the No-Build and Build Alternatives were predicted using the FHWA TNM, Version 2.5, computerized highway noise prediction model. The noise levels for the design year (2032) Build Alternatives were calculated and compared to the existing condition noise levels at 43 noise sensitive sites along the project corridor. Those locations provided representative data to evaluate noise levels and potential noise impacts throughout the study area. To predict traffic noise levels using TNM, certain input

parameters are needed. These include detailed roadway geometry, receiver locations, propagation characteristics, topography, and traffic data.

Tables presenting the comparison of the noise levels for the existing (2007), future No-Build (2032), and future Build (2032) conditions within the four general project areas are included in the updated final *Noise Study Report*.

The analysis to determine the extent of noise impacts associated with the Proposed Build Alternative was accomplished by developing a contour, or isopleth, extending outward from the proposed roadway locations. The distance from the proposed edge of pavement where noise impacts are expected was determined in two steps:

- Step 1 – Establish the distance from the road where the predicted noise level is at 66 dBA;
- Step 2 – For those receivers reporting less than 66 dBA, check the representative ambient level in that area, and if the ambient level is 15 dBA less than the predicted level, establish the distance at which the predicted level is equal to the ambient level plus 15 dBA.

Using these two steps, a noise impact isopleth was determined for the Proposed Build Alternative. The noise sensitive sites located between the proposed roadway and the isopleth are expected to experience noise impacts as defined by FHWA and FDOT procedures. Predicted noise levels determined for the Proposed Build Alternative indicate that noise impacts will occur in several areas. The updated final *Noise Study Report* has further information and graphics depicting the locations of the potentially impacted sites within the noise contours.

Potential traffic noise mitigation measures that may be considered for the project include the following:

- Construction of noise barriers within the proposed right-of-way;
- Modifying the proposed horizontal and/or vertical alignment of the roadway;
- Acquisition of property to serve as buffer zones to preempt development that would be adversely impacted by traffic noise;
- Modifying speed limits, and;
- Restricting truck traffic.

Of the above mitigation measures, the noise barrier option is the most practical and effective choice. Modification of roadway horizontal or vertical alignments for the purpose of noise reduction is too costly and is not practical in terms of engineering design considerations. Substantial changes to the roadway alignment or profile are neither necessary nor compatible with project constraints. Acquisition of private property adjacent to the proposed right-of-way to act as buffer zone would not be practical. Lowering speed limits or restricting truck traffic would be inconsistent with the project need and purpose.

A noise barrier is considered feasible if it meets the following criteria:

- A noise barrier must provide a minimum noise reduction of at least 5 dBA with a design goal of 10 dBA or more, and;
- The cost of the noise barrier should not exceed \$42,000 per benefited noise sensitive site unless a higher level of expenditure can be justified by other circumstances. This is the reasonable cost limit established by FDOT. A benefited noise sensitive site is defined as a site that would experience at least a 5 dBA reduction as a result of providing a noise

barrier. The current unit cost used to evaluate economic reasonableness is \$30 per square foot, which covers barrier materials and labor.

The TNM model was used to analyze the acoustical effectiveness of a noise barrier at each of the noise sensitive sites with a predicted future noise level that approaches or exceeds the NAC. The noise abatement analysis indicates that there are 88 benefited receivers which met the criteria for a noise barrier. A summary of the noise impacts for the Proposed Build Alternative, listed by county, is presented in **Table 4-8**.

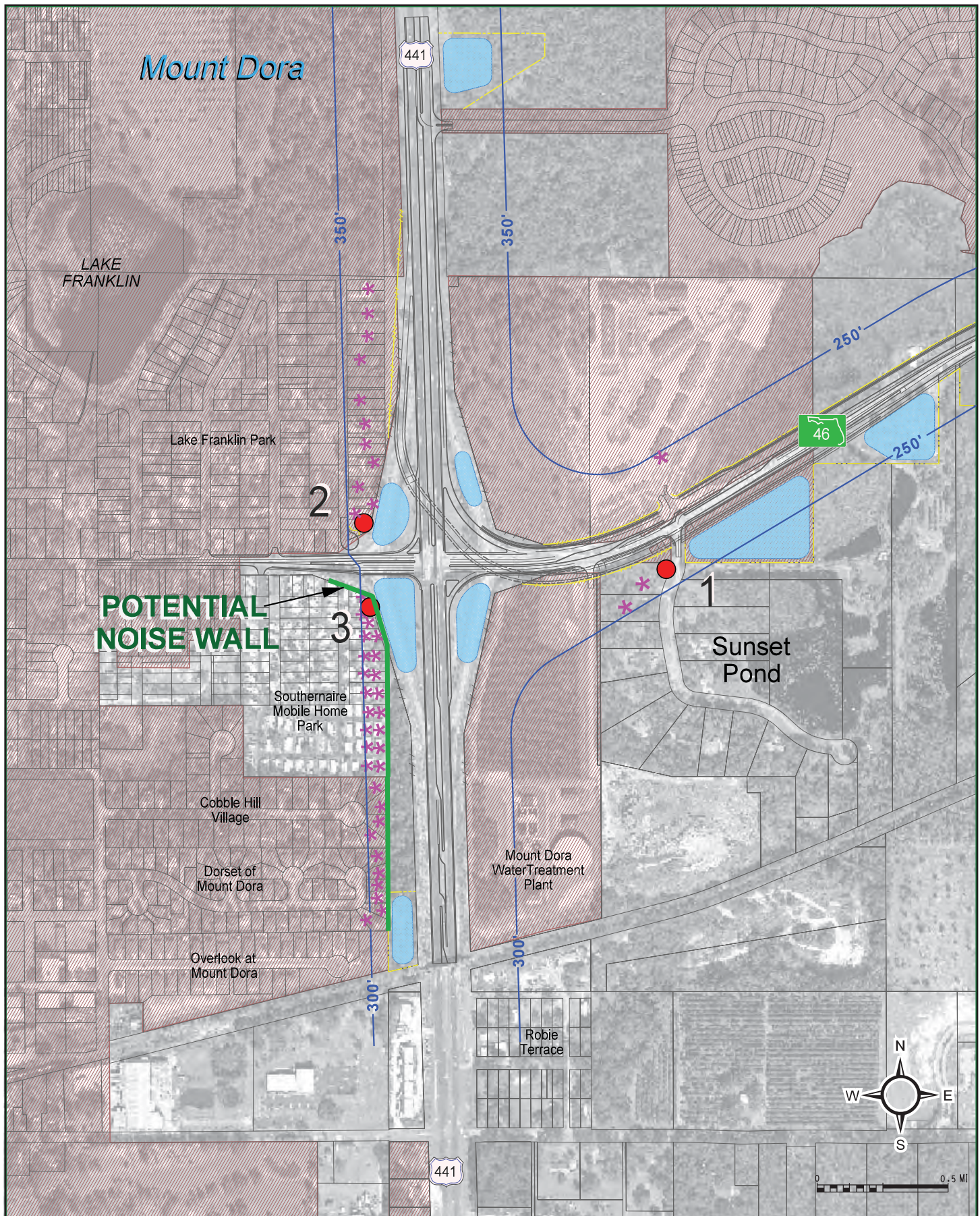
TABLE 4-8
Summary of Proposed Build Alternative Noise Impacts

	Existing Residences	Planned/ Permitted Residences	Non-Residential (Churches, Schools)	Total	Benefited Receivers*
ORANGE COUNTY					
Kelly Park Road Interchange Alignment with Systems Interchange Alternative 1 and Orange County Alternative 1	53	0	0	53	0
LAKE COUNTY WEST					
US 441/SR 46 Interchange Alternative 2 with SR 46 North Widening and Lake County West Alternative 1	62	2	0	64	28
LAKE COUNTY EAST					
Neighborhood Lakes Alternative 1	4	0	0	4	0
CR 46A Alternative 1A	0	1	0	1	0
Southern (Red) Alignment with Parallel Service Road	5	0	0	5	0
SEMINOLE COUNTY					
Wekiva Parkway with Frontage Roads North Widening of SR 46 corridor	98	0	1	99	50
Alternative B Connection to SR 417/I-4 Interchange	22	0	2	24	10

* Number of receivers that may benefit from a noise barrier determined to be potentially feasible and cost reasonable.

The results of the noise abatement evaluation indicate:

- A 16 foot high noise barrier wall meets cost reasonable criteria for the Southernaire Mobile Home Park, Cobble Hill Village, and Dorset of Mount Dora subdivisions in the Lake County West project area. This is noise monitoring location #3 on Exhibit 4-10, near the US 441/SR 46 interchange. **Exhibit 4-13 Sheet 1** shows the general location of the proposed noise wall.
- A 22 foot high noise barrier wall meets cost reasonable criteria for the Twelve Oaks RV Resort in the Seminole County project area. This is noise monitoring location #35 on Exhibit 4-10, on the north side of SR 46. **Exhibit 4-13 Sheet 2** shows the general location of the proposed noise wall.
- A 16 foot high noise barrier wall meets cost reasonable criteria for the Ballantrae Apartments (formerly Cobblestone Apartments) in the Seminole County project area. This location is southeast of noise monitoring location #40 on Exhibit 4-10, on the west side of International Parkway. **Exhibit 4-13 Sheet 3** shows the general location of the proposed noise wall.
- Noise barriers were determined to not be a feasible and/or cost reasonable abatement measure at 162 noise sensitive sites identified as impacted by the proposed project.

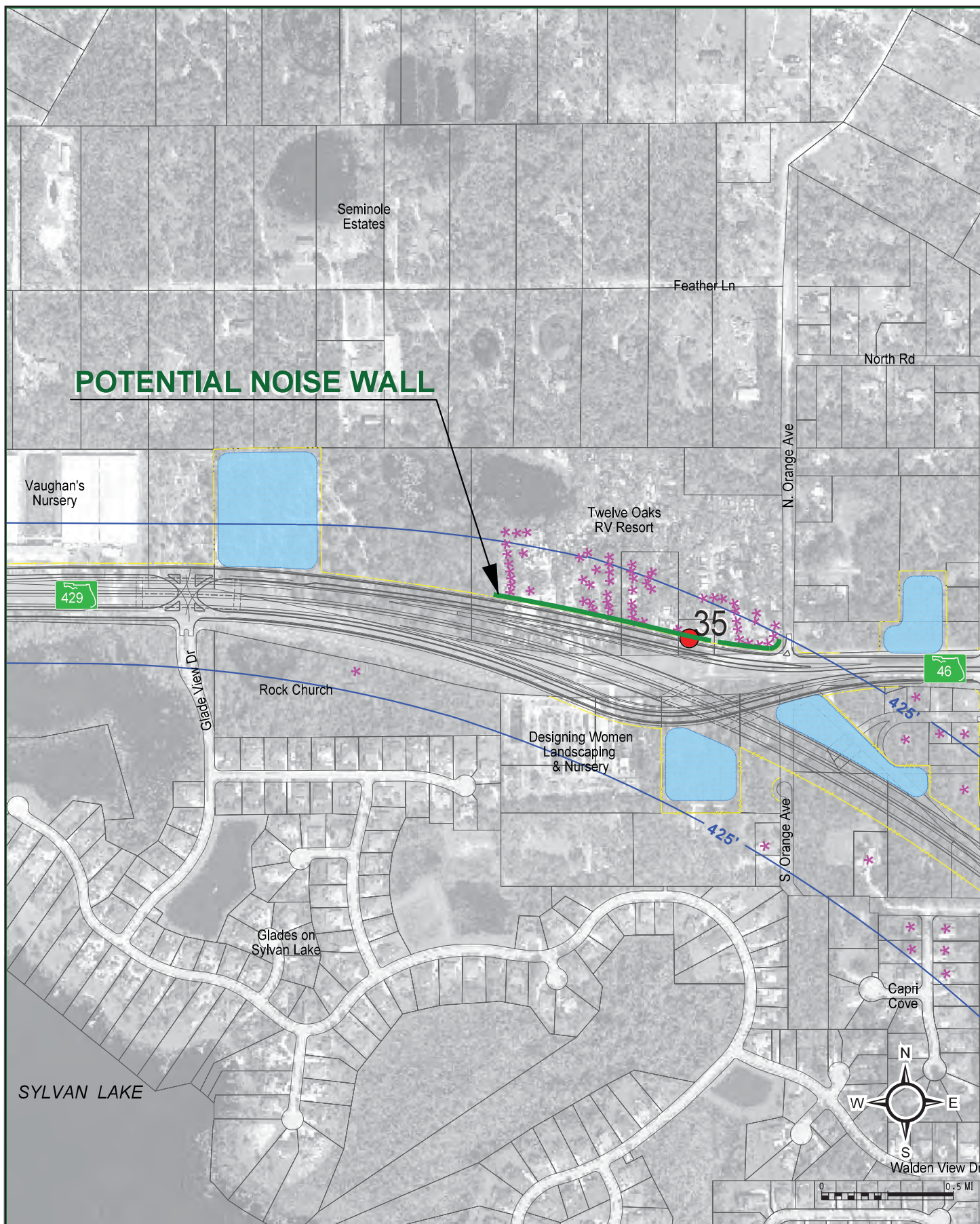


LEGEND

- Noise Monitoring Location
- * Noise Impact Receptor
- Noise Contour (66 dBA/15 dBA increase)
- Noise Wall

Exhibit 4-13 Potential Noise Wall Location

Sheet 1 of 3

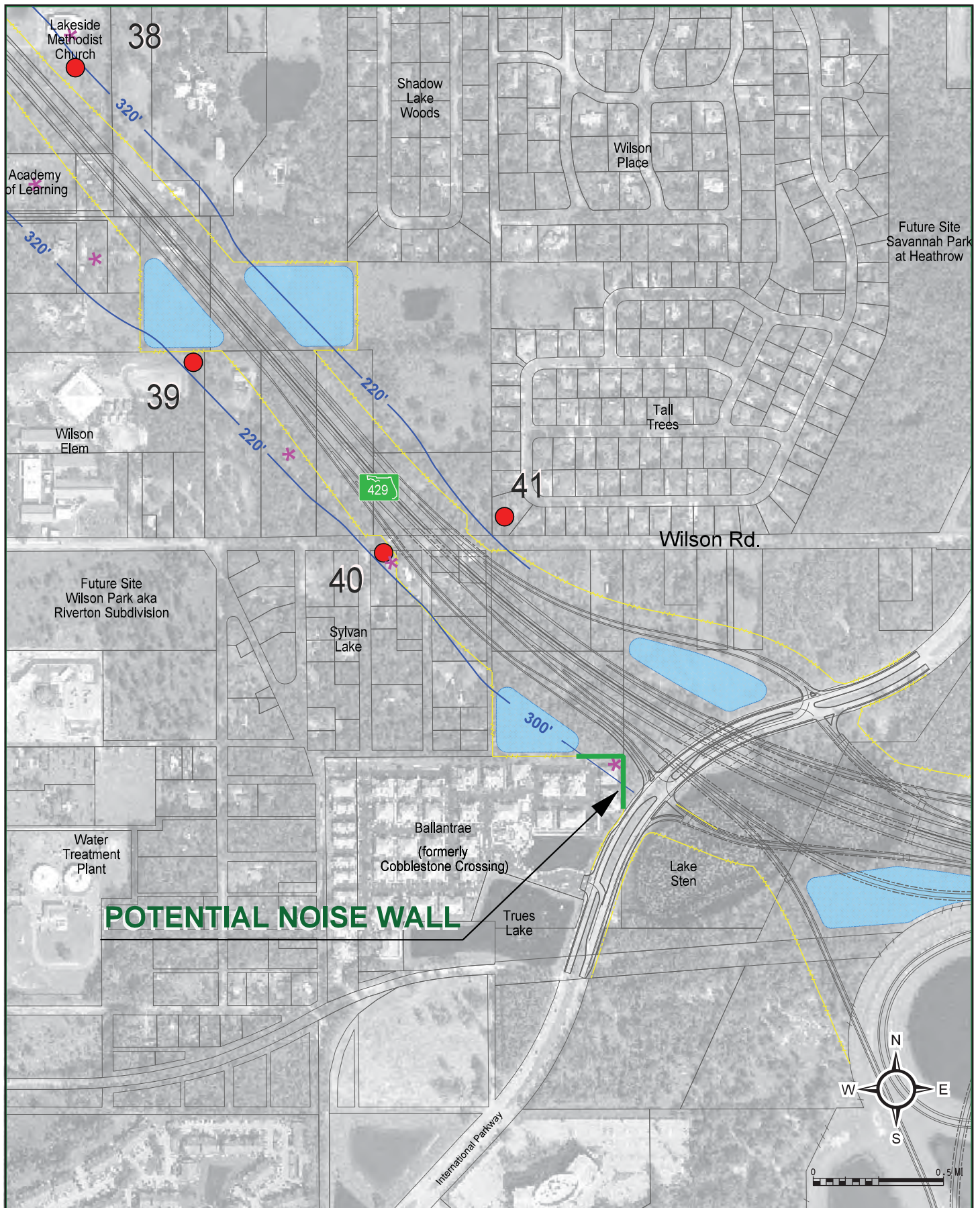


LEGEND

- Noise Monitoring Location
- Noise Contour (66 dBA/15 dBA increase)
- ✱ Noise Impact Receptor
- Noise Wall

Exhibit 4-13 Potential Noise Wall Location

Sheet 2 of 3



LEGEND

- Noise Monitoring Location
- * Noise Impact Receptor
- Noise Contour (66 dBA/15 dBA increase)
- Noise Wall

Exhibit 4-13 Potential Noise Wall Location

Sheet 3 of 3

Photographs of typical 16-foot and 22-foot noise walls are shown in **Exhibit 4-14**.

Table 4-9 provides a summary of recommendations for the evaluated noise barriers.

TABLE 4-9
Summary of Noise Barrier Analysis

Height/ Length (ft)	Number of Receivers with Insertion Loss of (dBA)					Number of Benefited Receivers	Total Estimated Cost	Cost per Benefited Receiver	Cost Reasonable Yes/No
	5-5.9	6-6.9	7-7.9	8-8.9	9+				
Southernaire Mobile Home Park, Cobble Hill Village, Dorset of Mount Dora									
16 ¹ /1788	0	3	6	8	11	28	\$858,016	\$30,643	Yes
Twelve Oaks RV Resort									
22 ¹ /1429	13	9	6	6	16	50	\$943,133	\$18,863	Yes
Ballantrae Apartments (formerly Cobblestone Apartments)									
16 ¹ /290	0	0	0	10	0	10	\$139,255	\$13,926	Yes

¹Noise Barrier Wall located at right of way line.

In this analysis, noise abatement is proposed based on the alignment of the Proposed Build Alternative. If pertinent parameters change substantially for any reason, the noise barriers may be altered or eliminated from the final project design. A final decision on construction of noise barriers will be made upon public input and completion of the project design. Where determined to be needed based on the results of the noise analysis, FDOT and the Expressway Authority are committed to the construction of noise barriers where reasonable and feasible, contingent upon the following conditions:

- Detailed noise analysis during the final design phase supports the need for abatement.
- Reasonable cost analysis indicates that the economic cost of the barrier(s) will not exceed acceptable guidelines as determined by FDOT and the Expressway Authority.
- Community input regarding the barrier(s), solicited by FDOT and the Expressway Authority during the final design phase, is positive.
- Safety and engineering aspects as related to the roadway user and the adjacent property owner(s) are acceptable.
- Any other mitigating circumstances have been resolved.

If, during the final design phase of the project, any of the contingency conditions listed above cause abatement to no longer be considered reasonable or feasible for a given location or locations, such determination will be made prior to requesting approval for construction advertisement. In addition, during final design and prior to construction, those sites that may be affected through any final design alignment changes, including those sites now considered borderline, will be revisited with regard to a noise analysis.



Typical 16 foot high noise wall (complete)

Source: FDOT, District Five EMO



Typical 22 foot high noise wall (under construction)

Source: FDOT, District Five EMO

Exhibit 4-14 Typical Noise Walls