

5. Traffic Noise Analysis

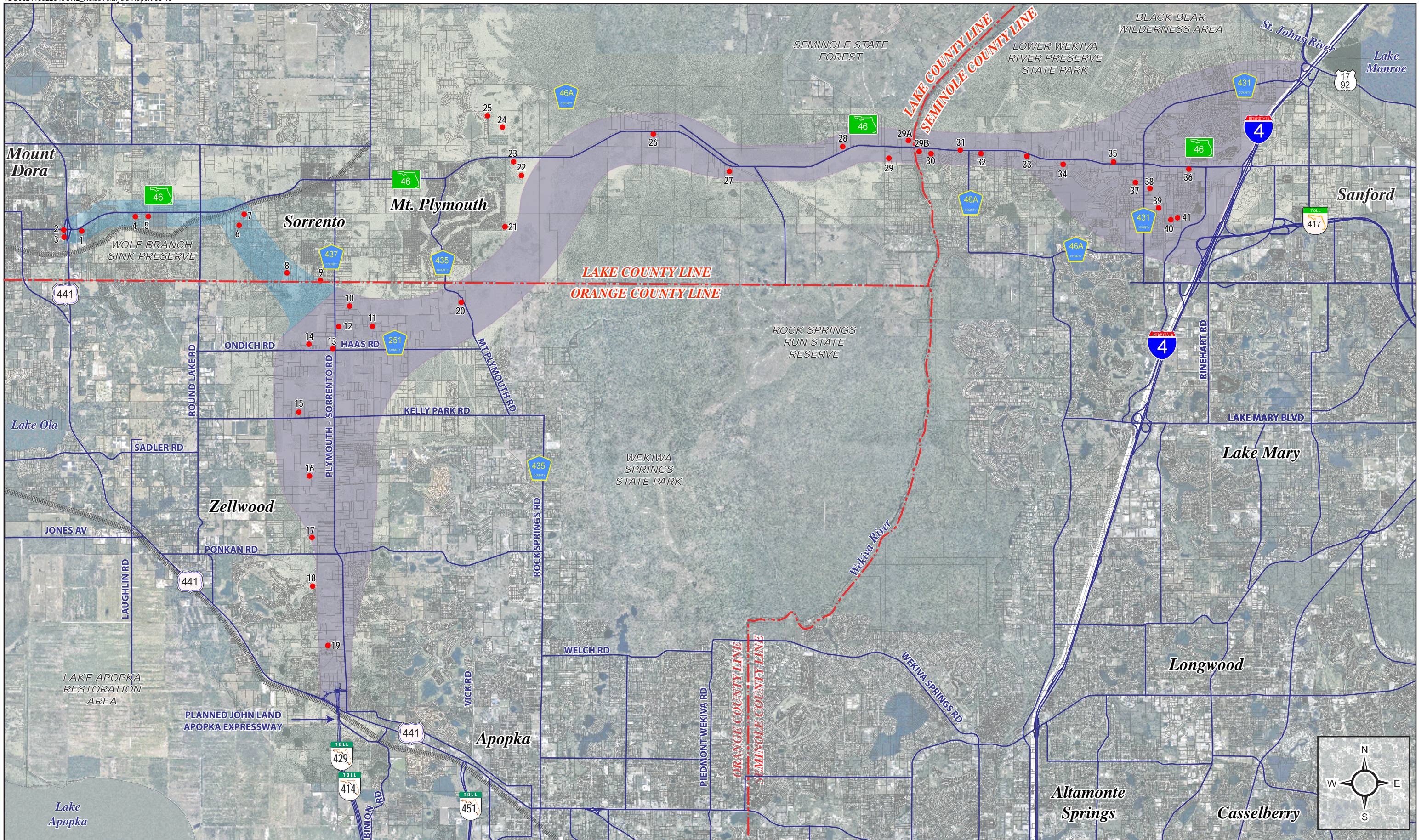
5.1 Measured Noise Levels

Field measurements were conducted according to procedures described in *Measurement of Highway-Related Noise, Report No. FHWA-PD-96-046* (FHWA, 1996). Concurrent with noise measurements, traffic counts along with posted speed limits were taken and notation was made of weather conditions and any unusual noise events (i.e., sirens, barking dogs, aircraft, etc.). Noise levels were measured using a Bruel and Kjaer (B&K) Type 2236 Larson Davis 820 SLM precision sound level meter equipped with a B&K 4188 ½" 2138 microphone. A B&K Model 4231 acoustical calibrator was used to calibrate the sound level meter before each measurement to ensure the accuracy of the measurements. This instrumentation complies with the requirements of the American National Standards Institute (ANSI) and International Electrotechnical Commission (IEC) for Type I (precision) sound-level equipment. All the systems that were used are laboratory calibrated within a 12-month period prior to the measurements.

Three short-term noise level measurements were conducted at each of the 43 sites in order to determine the existing background noise levels within the project study area. The measurements were taken during the morning and afternoon traffic periods to characterize the daily noise exposure along the project corridor. The monitoring locations (M1 through M41), as presented in **Exhibit 5-1**, are representative of the noise-sensitive locations in the project study area. **Table 5-1** summarizes the results of the noise levels measured and their comparison to levels predicted by the computer noise model.

The noise level prediction model is approved for use if measured and predicted noise levels are within the FDOT tolerance standard of 3 dBA. The ability of the FHWA Traffic Noise Model (TNM) to accurately predict noise levels for this project was confirmed.

As presented in Table 5-1, the noise levels predicted by the computer model at the majority of the monitoring locations are within the expected 3 dBA of the measured noise levels. The small differences between the measured and predicted noise levels indicate that the TNM may be used to accurately calculate traffic noise exposure at areas adjacent to the roadway.



LEGEND

- Wekiva Parkway Study Area
 Noise Monitoring Locations
- SR 46 Realignment Study Area

Exhibit 5-1 Noise Monitoring Locations

TABLE 5-1
Existing Noise Levels, Leq In dBA

Monitoring Location	Description	Measured Leq (dBA)	Predicted Leq (dBA)*	Difference (dBA)*
M1	101 Pond Road	54.9 (AM)	57.2	+2.3
M2	180 Stanley Bell Drive	64.5 (AM)	66.1	+1.6
M3	29 Collins Court-Southernaire Mobile Home Park	64.8 (AM)	66.0	+1.2
M4	30943 Buttercup Lane	64.8 (AM)	66.8	+2.0
M5	30947 Vista View	69.8 (AM)	70.2	+0.4
M6	22541 Coronado Drive	45.5 (AM)	-	-
M7	22540 SR 46	60.9 (PM)	60.5	-0.4
M8	23244 Oak Lane	39.4 (AM)	-	-
M9	30002 Azalea Avenue	48.6 (AM)	-	-
M10	6501 Plymouth Sorrento Road	47.5 (PM)	-	-
M11	2424 Boch Road	42.7 (PM)	-	-
M12	6303 Plymouth Sorrento Road	48.2 (PM)	49.5	+1.3
M13	5910 Plymouth Sorrento Road	59.7 (PM)	57.6	-2.1
M14	3435 Ondich Road	44.1 (PM)	46.0	+1.9
M15	3449 West Kelly Park Road	51.4 (PM)	53.8	+2.4
M16	4476 Plymouth Sorrento Road	42.3 (PM)	-	-
M17	3145 North Phils Lane	42.9 (PM)	-	-
M18	2473 Putter Road-Zellwood Station	46.4 (PM)	-	-
M19	Formerly Stanton Ridge	42.8 (PM)	-	-
M20	6604 Mt. Plymouth Road	47.2 (AM)	44.0	-3.2
M21	30825 Duxbury Avenue	37.8 (AM)	-	-
M22	Camp Challenge-Easter Seals-Rear	46.6 (PM)	-	-
M23	Camp Challenge-Easter Seals-Front	69.6 (PM)	69.0	-0.6
M24	26423 SR 46	42.1 (PM)	-	-
M25	Heathrow Country Estates	46.7 (PM)	-	-
M26	28714 SR 46	57.4 (PM)	53.5	-3.9
M27	29610 SR 46	72.2 (AM)	69.3	-2.9
M28	31343 SR 46	51.6 (PM)	50.2	-1.4
M29	31852 Wekiva River Road	54.8 (AM)	51.8	-3.0
MS29A	Wekiva River, N of SR 46	66.0 (AM)	62.2	-3.8
MS29B	Wekiva River, S of SR 46	56.8 (AM)	-	-
M30	180 River Oaks Circle	58.4 (AM)	56.5	-1.9
M31	8400 SR 46	60.5 (AM)	60.9	+0.4
M32	8206 Emerald Forest Court	63.3 (AM)	60.8	-2.5
M33	Future site of Venetian Shore Estates	69.4 (AM)	66.4	-3.0
M34	7010 Glade Road	61.6 (PM)	62.8	+1.2
M35	351 Sunbelt Circle-Twelve Oaks RV Resort	64.1 (PM)	63.5	-0.6
M36	Publix parking lot	69.8 (PM)	68.9	-0.9
M37	201 Capri Cove	47.8 (PM)	-	-
M38	Lakeside Fellowship Church	54.0 (PM)	-	-
M39	Wilson Elementary School	49.6 (PM)	-	-
M40	1455 Pacific Avenue	53.0 (PM)	-	-
M41	Tall Trees-Near Wilson Road	54.3 (PM)	-	-

* For those monitoring locations with no entry, there was no existing traffic data available.

5.2 Noise Model

Existing and future noise levels 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 noise sensitive sites along the project corridor.

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. In some cases shielding effects of existing structures and property line walls had to be taken into account in order to draw a realistic comparison of the model to actual site conditions; however, in most cases, such effects were not considered in the final analysis of noise conditions because evaluated receivers are close to the roadway and devoid of any intervening shielding factors. Projected existing conditions and design year average daily traffic (ADT) volumes, vehicle classifications, and speeds for each segment were obtained from the project traffic consultant's draft revised *Design Traffic Report* (March 2010). The traffic data used for this noise study is summarized in **Table 5-2**.

TABLE 5-2
Design Volume Traffic Volumes

Existing and 2032 No Build*		2032 Build*	
Facility	DHV	Facility	DHV
4-Lane Arterial (State-Class I)	1,810	Freeway 4-Lane	2,940
4-Lane Urban (Non State Major)	1,120	Freeway 6-Lane	4,550
2-Lane Rural (State-Class I)	720	Arterial 6-Lane	2,720
		1 Lane Ramp	804
		2 Lane Ramp	3,000
Daily Truck= 11.58 % (arterials)		Daily Truck= 11.58 % (arterials)	
Peak Truck= 5.78 % (assumed half of daily truck)		Peak Truck= 5.78 % (assumed half of daily truck)	

*LOS C directional volumes by facility type and vehicle mix percentages provided by project traffic consultant

For modeling purposes, noise level predictions are made for the traffic characteristics that yield the worst hourly traffic noise on a regular basis. Typically, the worst hourly traffic volume is the peak level of service (LOS) C.

The purpose of the noise level measurements was to validate the use of TNM in predicting traffic noise exposure within the study area. The project area was closely inspected in order to accurately model the roadway and receiver locations. During the field inspection, site-specific features which may affect the acoustical condition at each location, such as existing terrain features, building structures, existing barriers, intervening ground types, and roadway and receiver elevations were noted. The Noise Study Methodology has been approved by FDOT and the Expressway Authority.