

5.4 Noise Abatement

Noise barriers reduce noise levels by blocking the sound path between a roadway and noise sensitive sites. To effectively reduce traffic noise, a noise barrier must be relatively long, continuous (with no intermittent openings) and of sufficient height.

Noise barriers were evaluated within Orange and Lake Counties at the right of way line at heights ranging from 6 feet to 22 feet. Noise barriers were evaluated along the outside edge of paved shoulder of the elevated expressway in Seminole County at heights ranging from 6 feet to 8 feet. Noise barriers were also evaluated along the right-of-way line at heights ranging from 6 feet to 22 feet at similar locations. For a noise barrier to be considered reasonable and feasible, the following minimum conditions should be met:

- A noise barrier must provide a minimum noise reduction of at least 5 dBA with a design goal of 10 dBA, or more.
- 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 each noise barrier. A discussion of the noise barriers evaluated for each noise sensitive site with a predicted future noise level that approaches or exceeds the NAC is provided below. At each barrier location, the feasibility (i.e., at least a 5 dBA reduction can be achieved) was established. If feasible, then the cost reasonableness was evaluated. The location, length, and height of a barrier were optimized for all of the impacted noise sensitive sites to determine the most effective barrier configuration. The optimization process considered maximizing the number of impacted noise sensitive sites that could be provided at least a 5 dBA reduction while trying to reduce the cost below the reasonable cost limit of \$42,000 per benefited noise sensitive site. Noise barriers were evaluated for every noise sensitive sites. The noise barriers analyzed for the preferred alternative are described below.

5.4.1 Orange County Preferred Alternative

Noise barriers were not evaluated for the Plymouth Harbor subdivision because it does not have any permits for construction from the City of Apopka and therefore doesn't qualify as a noise impact. A noise barrier was evaluated for the **Plymouth Sorrento south area** as it had 10 residences predicted to experience future noise levels that approach or exceed the NAC (see **Exhibit 5-8**). This noise barrier was evaluated along the right-of-way line at heights ranging from 6 feet to 22 feet. The results of these analyses are shown in **Table 5-8**. Based on the analysis, there were no benefited receivers. Therefore, a barrier in the Plymouth Sorrento south area is not feasible. The residences are located a few hundred feet from the alignment therefore it is difficult to achieve a 5 dBA reduction.