

State Project No. 10000-1531

SUPPLEMENTAL NOISE ANALYSIS  
AND  
STUDY REPORT

NORTHWEST HILLSBOROUGH EXPRESSWAY

Interstate - 275  
to  
SR 597 (Dale Mabry Highway)

Hillsborough County, Florida

U.S. Department of Transportation  
Federal Highway Administration  
Florida Department of Transportation

and

Tampa-Hillsborough County Expressway Authority  
Cooperating Agencies

September, 1986

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## I. Purpose of Report

This report has been prepared as a supplement to the Noise Analysis and Study Report, Northwest Hillsborough Expressway, August 1985. Its purpose is to identify noise impacts and assess the feasibility of constructing structural noise barriers where impacts are expected to occur. The format and content of this document are based on the procedures established in Federal-Aid Highway Program Manual, Volume 7, Chapter 7, Section 3, "Procedures for Abatement of Highway Traffic Noise and Construction Noise" (FHPM 7-7-3).

## II. Project Description and Status

Based upon the Draft Environmental Impact Statement and subsequent input from the public hearing, the preferred alignment chosen for this project is the Lake LeClare Alignment with the southern terminus. This report investigates the impacts along this preferred corridor only.

Currently, this project is in the conceptual engineering design stage and a Final Environmental Impact Statement is being prepared pursuant to Federal Highway Administration guidelines.

## III. Noise Sensitive Sites

The potential impact of the proposed Expressway on noise sensitive sites was reevaluated due to minor alignment shifts of the preferred alternate; the Lake LeClare Alignment. Because of this shifting in alignment, some of the original noise sensitive sites which were chosen for analyses are now displaced by the project's corridor. One receiver, Receptor #21, is no longer considered a valid receptor because of a considerable shift in alignment away

from its location. In these instances, the next closest receptors along this altered alignment, which would expect to experience the greatest noise impacts, were chosen for analyses. The remaining original receivers, which still are valid noise sensitive sites, may or may not reflect a change in decibel impact based on their proximity to alignment changes. Table 1 gives a description of all receptors chosen for analyses and their location. Numeric descriptors for receptors represent the same receptor presented in the original Noise Study Report. Alphanumeric descriptors for receptors represent new receptors which will be impacted or receptors adjacent to original receptors which are now being displaced. For example, Receptor 14A represents an adjacent receptor to the original Receptor 14 which is now to be displaced by a minor alignment shift. Receptors modeled in the original report which are being displaced include receptors 14, 18, 25, 26, and 27.

The noise receptor sites depicted on the map in the original Noise Study Report can still be referenced for alphanumerically described receptors since they are located in the immediate vicinity of the original numerically described receptors.

Receptors 29, 31 and 32 have been dropped from further analyses since they were arbitrary representative receptors set at 25 feet from the right-of-way line and based on information to date, no noise sensitive sites are expected to be constructed at their locations.

Table 1

Noise Receptor Descriptions

3	Isolated Residence	2935' N. of Van Dyke Road 740' E of Darby Lane
4	Isolated Residence	125' N of Van Dyke Road 450' W of Darby Lane
11	Isolated Residence	265' S of Storm Road 1172' E of Tobacco Rd.
12	Isolated Residence	55' N of LeClare Road 950' E of Tobacco Rd.
13	Isolated Residence	2720' N of Rawls Road 260' E of Hutchinson Rd.
14A	Isolated Residences	2850' E of Ballamy Road 2400' N of Ehrlich Road
15	Neighborhood Residence representative of 7 residences	1315' N of Ehrlich Road 690' E of Bellamy Road
16	Isolated Residence-- representative of 2 residences	910' N of Ehrlich Road 450' W of Bellamy Road
17	Neighborhood Residence-- representative of 5 residences	280' S of Ehrlich Road 280' E of Briarthorn Dr.
17A	Neighborhood Residences representative of 3 residences	160' S of Ehrlich Road 990' E of Briarthorn Dr.
18A	Neighborhood Residences representative of 3 residences and 2 mobile homes	480' N of Gunn Highway 180' of Pulitzer Road
18B	Neighborhood Residence-- representative of 9 residences	1280' S of Ehrlich Road 135' E of Briarthorn Dr.
19	Isolated Residence	1830' S of Gunn Highway 230' E of abandoned RR

20	Mobile Home--representative of 4 mobile homes and 3 residences	65' N of Gardner Road 635' W of Timber Ridge Rd.
20A	Mobile Home-representative of 4 mobile homes	430' N of Gardner Road 360' W of Timber Ridge Rd.
21A	Mobile Home-representative of 2 mobile homes	1270' N of Linebaugh Ave. 650' E of Wilsky Road
22	Neighborhood Residence-- representative of 20 residences	260' N of Martinshire Dr. 10' E of N. Ascott Ct.
23	Neighborhood Residence-- representative of 18 residences	1830' N of Waters Ave. 8' W of Twelve Oaks Blvd.
24	Mobile Home-- representative of 2 mobile homes	254' N of Flora Ave. 105' E of Turnmore Drive
24A	Isolated Residence	850' S of Waters 390' E of Patterson Road
24B	Isolated Residence	100' S of Sitha Road 35' W of Patterson Road
25A	Neighborhood Residence-- representative of 6 residences	805' S of Johns Road 110' E of Southern Comfort Blvd.
26A	Neighborhood Residence-- representative of 9 residences	60' N of Larman Street 175' W of Southern Comfort Blvd.
27A	Neighborhood Residences-- representative of 4 residences	800' N of Hillsborough Ave. 185' W of Southern Comfort Blvd.
28	Mobile Home - representative of 1 Mobile Home and 1 business	70' N of Eleanor Dr. 80' W of Eisenhower Blvd.
30	SKYWAY PARK	East End of Tennis Court

#### IV. Results of Noise Analysis

Computer output data is presented in Table 2 and 2a. Table 2a exhibits receptor noise impacts influenced by airport operations from the Tampa International Airport. Wherever possible, in order to establish ambient conditions, computer predicted 1985 noise levels are presented (Receptors 4, 17, 17A, 28 and 30) where modeled receptors lie adjacent to the existing alignment or adjacent to an existing roadway within the project corridor (Traffic Data Is Contained In Appendix Of This Report). All other receptors, which do not receive significant noise contributions from an adjacent roadway, exhibit ambient levels based on 1985 field measured noises levels to represent "general" ambient conditions.

Abatement criteria for these receptors are presented in Figure 1. Receptors which warrant abatement consideration based on noise level increases in 2010 above existing 1985 noise levels (Receptor 13, 15, 17, 18A, 19, 20 and 20A) were considered for structural barrier feasibility. Also, receivers which either approached or exceeded FHWA abatement criterion of 67 dBA in 2010 (Receptors 24, 24A, 24B, 25A, 26A, 27A, 28 and 30) but are predicted to experience only a 0-4 dBA noise level increase from the proposed Expressway were considered for structural barrier feasibility.

Of these receivers to be analyzed, Receptors 13, 19, 24A, and 24B are isolated residences. Since structural barriers are rarely cost effective for individual receivers, the receptor with the greatest impact, receptor 13, was chosen for initial feasibility. Receptor 13 is predicted to exceed criterion by 1dB in 2010 and experience a noise level increase of 13dB. Since this receiver had the greatest potential for beneficial noise abatement and cost effectiveness, initial barrier feasibility was limited to this receiver.

Of the receivers influenced by airport noise levels, Receptors 24, 25A, 26A, 27A, 28 and 30, none were chosen for barrier design. The existing noise levels at these receivers were substantially high enough, 72-74 dB, that they would negate any significant abatement benefits derived from a structural barrier designed to lessen roadway contributions. Based on airport noise contributions, the best insertion loss obtainable would be 3 dB at Receptor 30 and this would not warrant the construction of a barrier wall.

TABLE 2

<u>Receptor criterion</u>	<u>Distance From Near Lane (Ft.)</u>	Predicted L <sub>eq</sub> (dBA) Noise Levels				FHWA
		<u>1985 Measured Noise level</u>	<u>Computer 1985 Pred. Noise level</u>	<u>1989 Noise level</u>	<u>2010 Noise level</u>	
3	610	47-50		49	53	67
4	172		58	56	60	67
11	127	53-55		60	64	67
12	181	55-57		57	62	67
13	130	55-57		63	68	67
14A	163	53-55		60	64	67
15	130	53-55		65	69	67
16	155	53-55		60	64	67
17	100		56	68	72	67
17A	460		59	59	63	67
18A	195	55-57		65	69	67
18B	190	53-55		58	63	67
19	110	53-55		64	67	67
20	105	55-57		67	71	67
20A	55	55-57		70	73	67
21A	404	60-65		52	56	67
22	700	60-65		61	64	67
23	1840	60-65		50	51	67

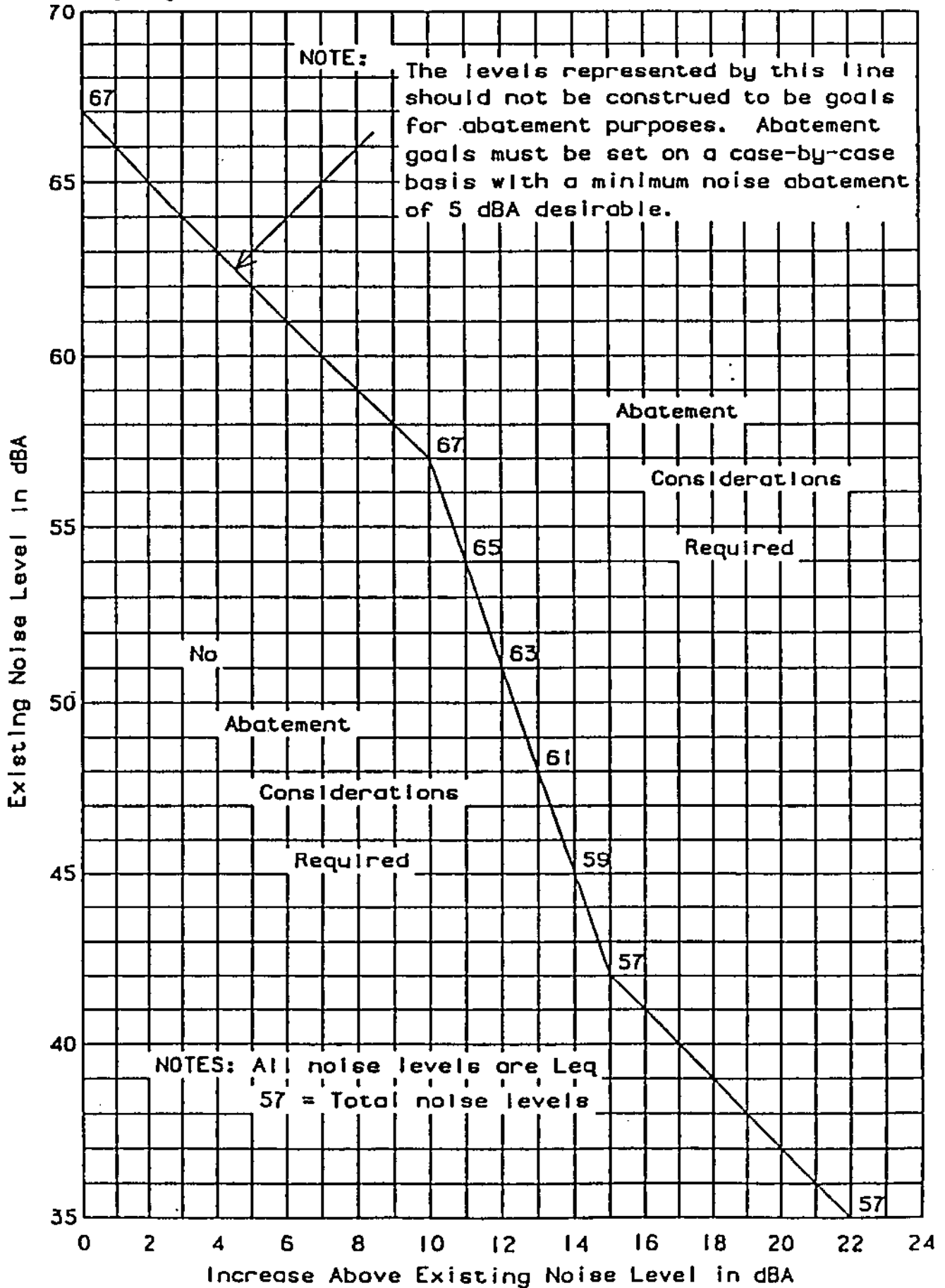
Predicted Leq (dBA) Noise Levels

Receptor	Distance from Near Lane	Airport Contour	1985 Computer	1989 Noise	2010 Noise	ADJ*	FHWA Criterion
		Noise Level	Predicted Noise Level	Level	Level		
24	190	72		69	69	74	67
24A	130	69		67	67	71	67
24B	55	68		70	70	72	67
25A	70	72		70	70	74	67
26A	140	73		67	67	74	67
27A	203	74		61	61	74	67
28	130	73	67	69	69	74	67,72
30	140	74	68	74	74	77	67

\* Adjusted due to Airport Noise Contribution

Table 2A

Figure 1: ABATEMENT CRITERIA ACTIVITY CATEGORY B



## V. Structural Barriers

Structural barrier feasibility was investigated for receivers represented by Receptors 13, 15, 17, 18A, 20 and 20A. All barrier walls investigated were modeled to be constructed of concrete and cost estimates presented are based on approximate 1985 cost figures.

### Receptor 13

<u>Receptor</u>	<u>Distance to Near lane (ft.)</u>	<u>2010 Predicted Noise level (dBA)</u>	<u>Noise Level with barrier (dBA)</u>	<u>Insertion Loss (dBA)</u>
13	130	68	60	8

Receptor 13 is an isolated residence. In order to achieve a 8 dB insertion loss, a barrier approximately 450 feet long and 8 feet high would be required at a cost of approximately \$50,000. An 8 dB insertion loss would approximate the minimal design to warrant construction of a barrier wall. Therefore, a structural barrier at this location would not be cost effective. Because barrier abatement was found to not be feasible at Receptor 13, isolated residences previously identified were not further investigated for barrier feasibility.

Receptor 15

<u>Receptor</u>	<u>Distance to near lane (ft.)</u>	<u>2010 Predicted noise level (dBA)</u>	<u>Noise Level with Barrier (dBA)</u>	<u>Insertion loss (dBA)</u>
15	130	69*	60	9
Residence	250	62		
Residence	232	62		
Residence	213	63		
Residence	197	67*	61	6
Residence	172	68*	60	8
Residence	172	68*	60	8
Residence	280	66*	60	6

\* ABATEMENT CONSIDERATION REQUIRED

Receptor 15 is a neighborhood residence representative of 8 residences, 5 of which warrant abatement consideration. In order to achieve a 6-9 dB insertion loss, a barrier approximately 1000 feet long and 12 feet high would be required at a cost of approximately \$172,500.

Receptor 17

<u>Receptor</u>	<u>Distance to near lane (Ft.)</u>	<u>2010 Predicted noise level (dBA)</u>	<u>Noise Level with barrier (dBA)</u>	<u>Insertion loss (dBA)</u>
17	100	72*	62	10
Residence	205	69*	63	6
Residence	120	72*	62	10
Residence	210	70*	63	7
Residence	175	70*	64	6

\* ABATEMENT CONSIDERATION REQUIRED

Receptor 17 is a neighborhood residence representative of 5 residences all of which warrant abatement consideration. In order to achieve a 6-10 dB insertion loss, two barriers approximately 400 feet and 750 feet long and 10 feet high would be required at a cost of approximately \$162,000.

The entrance ramp to the Expressway at this location prohibits one continuous barrier design and would require one barrier contiguous to the Expressway and an overlapping barrier contiguous to the entrance ramp.

#### Receptor 18A

<u>Receptor</u>	<u>Distance to near lane (ft.)</u>	<u>2010 Predicted noise level (dBA)</u>	<u>Noise Level with barrier (dBA)</u>	<u>Insertion loss (dBA)</u>
18A	195	69*	60	9
Mobile Home	100	72*	63	9
Mobile Home	175	70*	62	8
Residence	270	68*	61	7
Residence	235	68*	61	7

\* ABATEMENT CONSIDERATION REQUIRED

Receptor 18A is a neighborhood residence representative of 3 residences and 2 mobile homes, all of which warrant consideration. In order to achieve a 7-9 dB insertion loss, a barrier approximately 1200 feet long and 8 feet high would be required at a cost of approximately \$135,000.

Receptor 20

<u>Receptor</u>	<u>Distance to near lane (ft.)</u>	<u>2010 Predicted noise level (dBA)</u>	<u>Noise Level with barrier (dBA)</u>	<u>Insertion loss (dBA)</u>
20	105	71*	60	11
Mobile Home	131	67*	63	4
Mobile Home	132	67*	62	5
Residence	165	66*	61	5
Residence	245	64		
Residence	107	71*	60	11
Mobile Home	118	71*	63	8

\* ABATEMENT CONSIDERATION REQUIRED

Receptor 20 is a mobile home representative of 4 mobile homes and 3 residences, 6 of which warrant consideration. In order to achieve a 4-11 dB insertion loss, a barrier approximately 1250 feet long and 10 feet high would be required at a cost of approximately \$172,000.

Receptor 20A

<u>Receptor</u>	<u>Distance to near lane</u>	<u>2010 Predicted noise level (dBA)</u>	<u>Noise Level with barrier (dBA)</u>	<u>Insertion loss (dBA)</u>
20A	55	73*	61	12
Mobile Home	193	65*	63	2
Mobile Home	60	73*	61	12
Mobile Home	270	68*	63	5

\* ABATEMENT CONSIDERATION REQUIRED

Receptor 20A is a mobile home representative of 4 mobile homes, all of which warrant abatement consideration. In order to achieve a 2-12 dB insertion loss, a barrier approximately 1250 feet long and 8 feet high would be required at a cost of approximately \$138,000.

#### Barrier Cost Summary

<u>Receptor</u>	<u>Total # Receivers Requiring Abatement Consideration</u>	<u>Cost</u>	<u>Cost/Receiver</u>
13	1	\$ 50,000	\$50,000
15	5	\$172,500	\$34,500
17	5	\$162,000	\$32,400
18A	5	\$135,000	\$27,000
20	6	\$172,000	\$28,700
20A	4	\$138,000	\$34,500

Cost effectiveness for barrier feasibility were based on the following formula:

$$\text{Cost Effectiveness} = \frac{\text{Cost of Abatement}}{\text{Number of Dwelling Units}}$$

$$\text{Number of Dwelling Units} = \$25,000/\text{Dwelling Unit.}$$

Barriers at this time do not appear to be cost effective for receivers located at receptors 13, 15, 17 18A, 20 and 20A. The receivers at these locations are either too spread out for feasible barrier design or, as in the case of Receptor 17, effective barrier design conflicts with the configuration of the roadway.

Based on the noise analyses performed to date, there appear to be no apparent solutions available to mitigate the noise impacts at the locations identified, if any exist. If, upon evaluation during the final design phase,

it is determined that noise abatement is not feasible for a given location(s), such determination(s) will be made prior to granting approval of the reevaluation for construction advertisement.

APPENDIX

1985 ADT TRAFFIC VOLUMES

<u>Road</u>	<u>ADT</u>	<u>Speeds (M.P.H.)</u>
Van Dyke Road	4,670	45
Ehrlich Road (LOS C)	11,800	40
Eisenhower Blvd. (LOS C) (Memorial Highway to Hillsborough Avenue)	27,000	48
Eisenhower Blvd. (LOS C) (Courtney Campbell Causeway to Memorial Highway)	27,000	48

LOS C = Level of Service "C"

K = 10%

D = 50%

T = 4% (2% Medium Trucks)

(2% Heavy Trucks)