

Community Involvement in the Noise Barrier Selection Process: A Case Study

WIN LINDEMAN

ABSTRACT

In response to a community request, the Florida Department of Transportation conducted a survey to determine if a highway noise barrier should be constructed in the Maximo Moorings subdivision of St. Petersburg. Based on this survey and the resulting public workshops, a noise barrier was designed and erected that received a great deal of public acceptance. The procedures used in achieving this acceptance are identified.

In 1956, the Florida Department of Transportation (FDOT) requested that Interstate 4 be extended from the west side of Tampa to the north side of St. Petersburg. After 10 years of study and a change of designation from I-4 to I-75 to I-275, a corridor routing from Tampa through St Petersburg was determined as shown in Figure 1. Part of this corridor would involve an interchange at 54th Avenue South in the vicinity of the Maximo Moorings subdivision. As time and circumstances would show, environmental concerns by people in this subdivision would lead to one of the most intensive and positive community involvement programs related to noise in the history of FDOT.

ORIGINAL ASSESSMENT

In compliance with the National Environmental Policy Act of 1969 and related federal guidelines, an Environmental Impact Statement was completed and approved by FHWA, U.S. Department of Transportation, in 1972. The noise portion of this document consisted of a statement (1) that

there will be some increase of noise in the northern half of the project due to the retention of U.S. 19 and 31st Street parallel to it. In the southern half of the project the increase in noise level will be

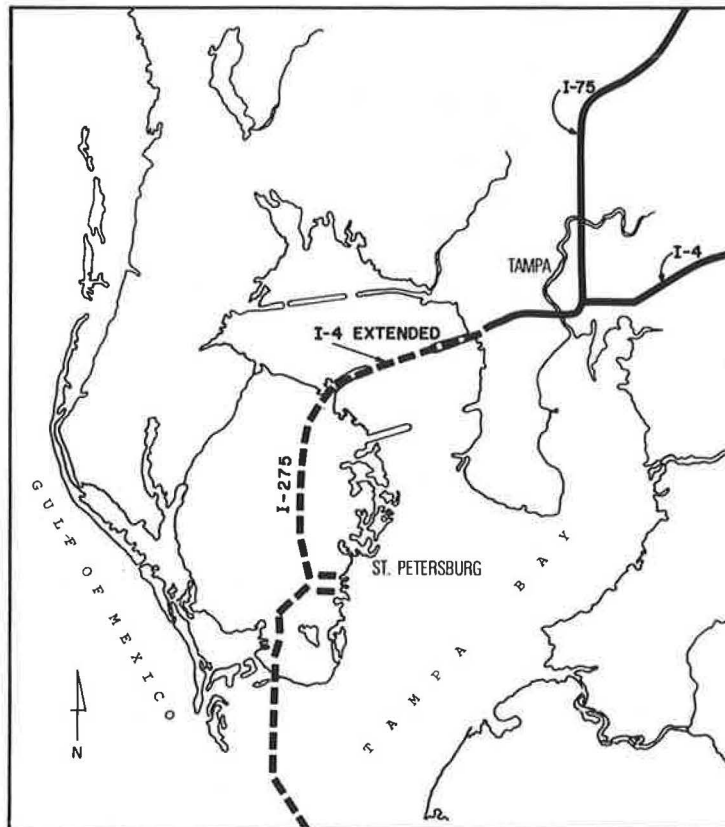


FIGURE 1 Location map of I-275 corridor route.

insignificant due to the rapid, non-stop nature of the traffic flow.

The proximity of the I-275 interchange to 54th Avenue South and the Maximo Moorings subdivision is shown in Figure 2. As I-275 progressed southward from Tampa, growing controversy surrounded the con-

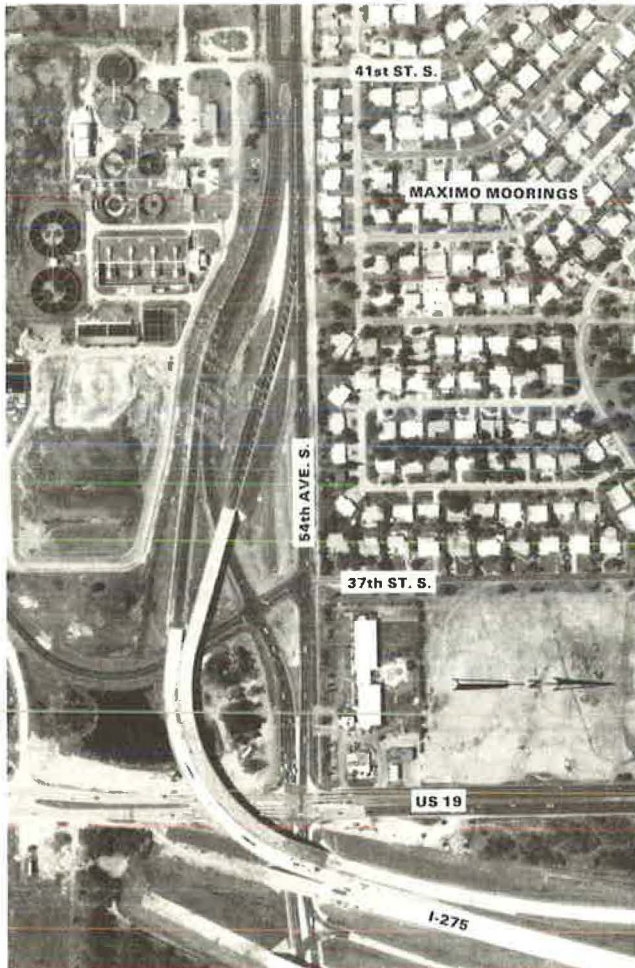


FIGURE 2 Interchange area of Maximo Moorings and 54th Avenue South.

struction of this urban freeway. As reported in a previous study (2), this controversy was widespread and often focused on perceived air and noise impacts of the projects. The development of seven noise barriers along the route of I-275 through the downtown area of St. Petersburg did nothing to diminish the attention focused on noise control.

DESIGN CHANGES AND REEVALUATION

After several years of preliminary design concepts and redesigns, the construction of the Interstate in the vicinity of the 54th Avenue South interchange became an approaching reality. A reevaluation of the impact of the design changes was made by FDOT's Bureau of Environment, pursuant to the requirements of Volume 7, Chapter 7, Section 2 of the Federal-Aid Highway Program Manual (FHPM 7-7-2) as it existed in

1980 (3). This reevaluation included an update of the previous noise assessment conducted for the original Environmental Impact Statement. This noise assessment was conducted in accordance with the dictates of FHPM 7-7-3 addressing highway traffic noise analysis and abatement considerations. The noise assessment, summarized in the reevaluation, identified three locations where noise abatement was considered appropriate and feasible. One of those locations was along the north side of 54th Avenue South between 37th and 41st Streets South. This location was adjacent to a portion of Maximo Moorings, a single-family subdivision, which is also the home of a number of citizens concerned about the environmental impacts of the construction of I-275 through the St. Petersburg area. The reevaluation noted (4) that "prior to the employment of any abatement techniques, an attitude survey will be conducted to obtain the viewpoint of nearby residents to determine if they favor abatement and, if so, what type they would desire."

CITIZEN INITIATIVE

Construction on that portion of I-275 involving the Maximo Moorings subdivision began during January 1982. At a public involvement meeting in early May 1982, a Maximo Moorings resident inquired about the status of the public attitude survey regarding noise abatement in the Maximo Moorings subdivision. Because the study area had been broken down into two construction projects, the original intent of FDOT was to conduct the attitude surveys just before the letting of the final project, which was located just south of 54th Avenue South. Because of continued design modifications and other controversy, the letting of the final job was further delayed, thereby postponing the attitude surveys.

A RESPONSIVE FDOT

Because the request for the survey was made in good faith, FDOT's response was to conduct a special survey of the Maximo Moorings subdivision and delay the others until the design was finalized in the southernmost project. With the assistance of the Bureau of Right-of-Way, a list of all owners of property directly abutting the project along 54th Avenue South was made. A letter was written by the Bureau of Environment to each property owner on June 21, 1982, that explained that a recent noise analysis had shown the need for noise reduction. Discussed in the letter were the dimensions of the proposed abatement wall and the need for input from the property owners. In addition, the letter indicated that a telephone survey would be conducted by the Bureau of Environment during the week of June 28, 1982. As scheduled, a telephone survey was conducted on June 28 and 29. This survey was successful in reaching all but one of the residents and that individual was finally contacted early in July after he returned from an extended vacation. A copy of the questionnaire and a summary of the results can be found in Figure 3.

After the telephone survey was conducted, a date was set for an informational workshop at a nearby motel. The time and day of the week selected for this workshop was a result of input gathered during the telephone survey. Two weeks before the workshop, a letter was sent to each property owner, indicating what would be discussed and soliciting their attendance.

Date - June 26-30, 1982 TELEPHONE SURVEY QUESTIONNAIRE

Introduction - Good Day. My name is Win Lindeman with the Florida Department of Transportation. On June 21st, I wrote you a letter telling you about the possible use of barrier walls to reduce the future noise levels from I-275 and 54th Street. If this is a convenient time, I would like to ask you a few questions regarding this matter and then I'll try to answer any questions you might have.

1. Do you feel noise is currently a problem in your neighborhood?
Yes - 11 No - 2 Don't Know - 0
2. If yes, what types of noise do you notice and how does it affect you?
Pile Driving - 3 Motorcycles - 6 Trucks - 6 Traffic - 6
3. How would you rate the present noise levels from 54th Avenue?
Very Annoying - 9 A Little Annoying - 3 Not At All Annoying - 1
4. At what time of day does the traffic noise seem to be the loudest or most annoying?
Midnight to 7:00 AM - 0 7:00 AM to 7:00 PM - 8 7:00 to Midnight - 0
5. Do you think a properly designed wall along 54th Avenue can effectively reduce traffic noise?
Yes - 7 No - 2 Don't Know - 4
6. Do you think road users tax money should be spent to reduce traffic noise?
Yes - 10 No - 1 Don't Know - 4
7. If a barrier wall is constructed, which of the following material types would you prefer?
Concrete Block - 1 (if stucco) Wood - 2 Metal - 0
Precast Concrete - 5 Other - 6
Cast-in-Place Concrete - 1
Earthen Berm and Vegetation - 2
Vegetative Screen - 3
8. What color (s) wall would you prefer?
White - 3 Green - 1 Beige - 6 Gray - 1
9. Would you prefer a vegetative screen to a solid wall?
Yes - 6 No - 7 Don't Know - 0
10. Would you be willing to release your potential access directly to 54th Avenue to allow the construction of a barrier wall on state-owned right-of-way?
Yes - 12 No - 0 Don't Know - 1
11. Personal Data
 - a. Sex of Respondent
Male - 7 Female - 6
 - b. Length of Residence (in years)
Range - 2.5 to 25
Mean - 10.8
 - c. Best Time For A Public Workshop
7:30 PM, Tuesday or Thursday
 - d. Name _____
 - e. Address _____

FIGURE 3 Telephone survey questionnaire and summary of results.

FIRST WORKSHOP

The first workshop was held July 15, 1982, at the site identified in the announcement that had been mailed previously. After an introduction of the FDOT and FHWA representatives and the residents as well, the homeowners (11 of 13 were present) were given a brief presentation on the history of the problem and the magnitude of the situation, the conditions of noise abatement, potential solutions and possible barrier materials, and the results of the telephone survey. Through the use of a tape recording and sound level meters, the residents were able to hear the existing noise levels and what those levels were predicted to be like in the future when the Interstate was completed. In that way, the residents could discern the increase of the noise over time and decide for themselves whether the impact was acceptable. At the end of the workshop, the citizens

were asked to make several decisions about noise abatement.

Conditions of Noise Abatement

At the beginning of the workshop, representatives of both FDOT and FHWA established the basic conditions under which the construction of a barrier for noise abatement would take place, including the premise that no additional right-of-way would be purchased by FDOT. If easements of any kind could not be obtained free-of-charge, this would be grounds for discontinuing the pursuit of building the wall. Obtaining easements free-of-charge was the most important condition related to the project because access rights were going to be required no matter what type of barrier was selected. It was also noted that cost was not going to be an immediate consideration but

was going to be an item to be dealt with if a preliminary design was chosen that appeared to be cost prohibitive.

Two other conditions for the discussion of abatement considerations were: that an earthen berm not be considered a viable alternative because of limited right-of-way, and that the barrier had to be between 6 and 14 ft high. These limits were based on the results of the computer noise analyses (using STAMINA 2.0) that indicated that a height lower than 6 ft would not give any noticeable reduction in noise and one more than 14 ft would not provide a significant decrease in noise levels compared with the significant increase in cost. The only other major point was that any abatement device would be placed as close to the existing right-of-way line as possible, which would maximize the barrier's effectiveness and also reduce the need for significant utility relocation.

Potential Solutions to Noise Level Problem

Three potential solutions to the increase in traffic noise levels were presented at the workshop: barrier walls, vegetative screens, and no abatement at all.

By using a slide representing the reduction of noise levels for barrier walls of increasing height at the right-of-way line (see Figure 4), the residents were able to discern the level of noise reduction available for any given height between 6 and 14 ft. A discussion was also held about the effect that placing "wings" on the barrier would have in increasing its effectiveness. As explained to the residents, these wings are extensions of the wall that are directed back toward the community at an angle that would reduce the amount of noise that can

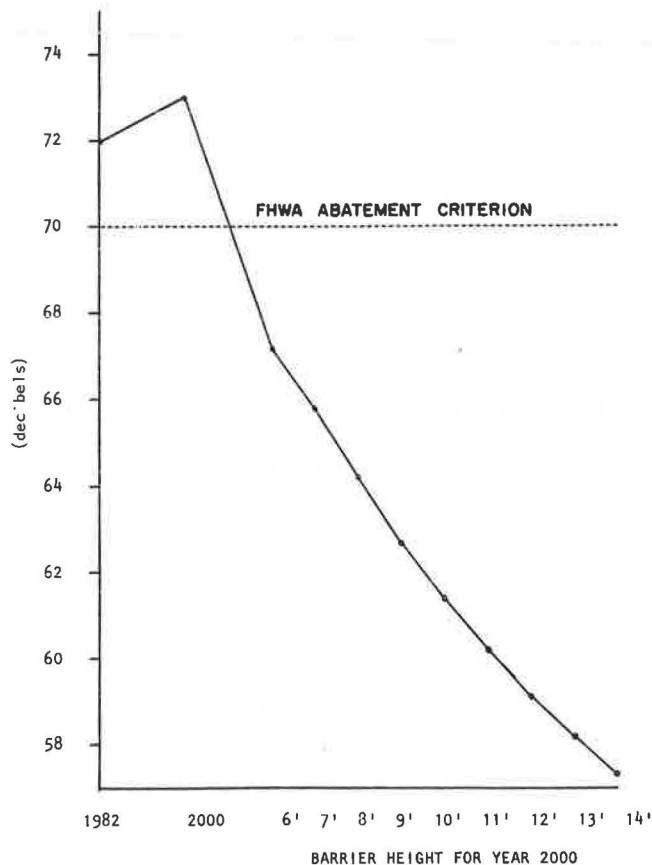


FIGURE 4 Noise barrier reduction guide.

leak around the ends. Also explained to the residents was that the effectiveness of the barrier at either end would be significantly reduced without using these wings even though they would most likely require donation of a right-of-way.

After the reduction in effectiveness as a result of not using wings was highlighted, the discussion moved to the effectiveness of vegetation as a source of noise abatement. The residents were told that within the limited space available, a thick planting of vegetation might be able to reduce noise levels by 3 decibels. This discussion also included the concept of psychological enhancement, which is the notion that if people do not see the source of noise it doesn't bother them as much.

Finally, by using slides, brochures, photograph collections, literature, and actual samples, a broad spectrum of noise barrier wall designs and materials was presented for consideration.

Results of Telephone Survey and Discussion

After the discussion of barrier materials, the results of the telephone survey were announced. These results were basically already known by the residents as a result of internal discussions and took little time to cover. The announcing of the survey results was followed by an open discussion of the pros and cons of a noise barrier, including such topics as the impacts on view, light, air, privacy, graffiti, litter, maintenance, access, and aesthetics. The residents were informed that the time for a decision about noise abatement was rapidly approaching and that their consolidated opinion and recommendation were needed; the meeting was adjourned for about 30 minutes to give the residents an opportunity to review the displays and literature on noise barriers and to discuss this information with their friends and relatives. They also were able to talk with FHWA and FDOT personnel to solicit responses to unanswered questions and to clarify any other matters that had come up.

Decisions by Citizens About Noise Abatement

When the workshop reconvened, the residents were asked to make four decisions about noise abatement.

The first decision made by the residents was whether, based on the information presented, they still wanted a barrier. Three residents said no and offered varying reasons for this decision: one was worried about the collection of exhaust fumes behind the wall and the impact this might have on her ill husband; the other two preferred the open view of the traffic and other activities that take place beyond their property lines. Because the latter two residents lived on the eastern end of the project area, it was stated that the barrier could easily be shortened to accommodate their wishes. Complying with the other resident's request was more difficult to address because she was located between residents who wanted the barrier. After an explanation of the impact such an opening in the barrier would have on both cost and effectiveness, she relented, largely due to neighborhood pressure and lack of a strong conviction that fumes would gather in quantities that could cause serious health effects. (The death of her husband preceded the construction of any barrier and therefore her concern became moot.)

The second decision the residents made was about the desired height of the barrier, as well as the level of attenuation they were willing to accept. After considerable debate over the merits of varying heights, a barrier 8 ft high was selected. Because

the terrain varied less than a foot from one end to the other, a uniform height was desired, although a variation in height would have been acceptable to FHWA and FDOT. The residents considered an 8-ft barrier a reasonable compromise between noise reduction and other factors such as view, light, and air flow.

Third, the residents decided that the material for the barrier would be concrete block that would be built on a footing and feature a cap and pilaster design similar to that shown in Figure 5. They wanted a stucco-type finish (referred to by FDOT as Class 5

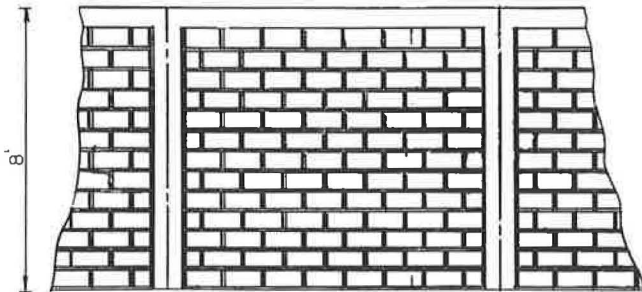


FIGURE 5 Drawing of original noise barrier design.

finish) in a beige color with the alternating panels having a red-brick veneer on the residential side of the barrier. The side facing the highway would be finished in the same beige Class 5 finish without the red-brick veneer.

The fourth decision facing the residents was whether to use wings on the barrier. To increase the effectiveness of the barrier, both affected property owners expressed a willingness to donate the right-of-way necessary for erecting the wings on each end; this gesture typifies the overall spirit of cooperation that the residents brought to this workshop. The owners were informed again that to increase effectiveness and minimize disruption to utilities, the barrier would be placed as close to the right-of-way line as possible and that this would require construction and maintenance easements as well as access rights, as described earlier.

Finally, the residents were informed that many hurdles were still to be overcome, but the information gathered as a result of the first workshop was considered vital and would put FDOT and FHWA on a clearly defined path toward noise abatement. With that qualifier placed on the evening's activities, the workshop was adjourned.

FDOT TAKES CHARGE

Based on the input from the workshop and subsequent contacts with the homeowners in the project area, FDOT initiated an engineering survey, a utility location assessment, and a right-of-way title search to determine property boundaries, deed restrictions, and other items that could affect the abatement project. However, by August 1982, the wheels of progress were starting to bog down: the utility assessment located a transformer pad that would have to be relocated and a sanitary sewer line that was directly below the proposed wall location. Manhole locations were noted and the problem was directed to the design staff. By using some creative engineering, it was decided that the wall could still be built at the right-of-way line by relocating the

transformer pad slightly and by incorporating the manhole inlets for the sanitary sewer line into the footing itself.

By mid-September 1982, FDOT had requested formal concurrence from FHWA on the construction of the barrier wall along 54th Avenue South. In this request, FDOT noted that if the donation of right-of-way or construction easements was withheld for any reason, it was their intention to abandon the concept of the abatement wall. FHWA concurrence for the construction of the proposed wall at a cost of approximately \$75,000 was received in late September 1982. FDOT requested federal funds to initiate title searches and to do the final design engineering work. This request for federal participation was granted in early October 1982 and the wall was back on track once again.

CHANGING VIEWPOINTS

During the period of conducting title searches and subsequent negotiations with the property owners to obtain construction easements and access rights, one of the residents decided to refuse to grant a construction easement. His reasoning centered on the close proximity of his swimming pool to the right-of-way line—he felt that the construction activity would or could damage his pool, and he did not want the mess and inconvenience of the wall-building operation. However, it was still his desire to have the wall built to protect him from the noise as well as to protect his neighbors.

The FDOT engineer in charge of the preliminary design aspects of the wall met with the various property owners on site to solicit input and attempt to identify a workable compromise. Working through the president of the Maximo Moorings Civic Association, the engineer continued his effort to either persuade the reluctant owner to change his mind or to devise a reasonable alternative. After receiving a brief education from the Bureau of Environment staff on noise barrier materials and their many pros and cons, the engineer set about trying to find one that would fit the needs of this project.

The FDOT design engineer, based on his study of barrier materials, believed that the use of precast concrete might be a workable compromise. He contacted representatives of the Reinforced Earth Company and the Easi-Set Company and requested additional information and a set of preliminary design concepts from each based on information that he furnished to them. These design concepts were returned and subsequently submitted to the contractor working on the interchange. The contractor then submitted a preliminary bid estimate on all three alternatives (the two designs sent in by the private companies and the original concrete block wall design). Because the preliminary estimates were all considered within an acceptable range, FHWA approved the use of any of the options, depending on the input of the local residents.

Based on the results of the design engineer's efforts, a second workshop was considered necessary. The purpose of this workshop was to reconsider the options available concerning the location, design, and finishes of the wall and to sign construction easements and related documents. The residents were notified by mail that the second workshop would be held at the same location as the first one. To encourage attendance, the Maximo Moorings Civic Association was also requested to actively solicit comments and suggestions and to attend the workshop for the purpose of providing additional input. Representatives of the precast industry were invited to make presentations on their various barrier wall

materials. While the workshop was being prepared, FDOT made a decision that if the wall was to be built, an attempt would be made to construct it through a supplemental agreement with the prime contractor for the interchange.

SECOND WORKSHOP

At the second workshop, held in May 1983, slightly more than half of the property owners were present, along with other members of the Maximo Moorings Civic Association, FDOT staff, and a representative of the Reinforced Earth Company. The design engineer in charge of the project explained the nature of the problem, which centered on the construction easement difficulties associated with the conventional block wall design. He offered three alternative design concepts: the conventional block wall and two precast wall designs--Sierra Wall and FANWALL. He explained that a precast wall could probably resolve the dilemma that was facing the residents and FDOT because it could be placed near the right-of-way line without any need for construction activities on the residential side of the wall in most locations. Because precast walls do not require a poured footing and all of the attendant construction activities, the homeowners would not have to worry about damage to their pools, yards, and other fixtures. The representative of the Reinforced Earth Company made a presentation on one of his company's products, FANWALL. Observing a series of slides and handouts showing the wall and its alignment, the residents learned how this wall could be placed along the project without removal of utilities, fences, or anything else through careful design. After explaining how the use of this type of product would eliminate the need for a construction easement from most property owners, and how it would reduce the length of construction time from 3 months to 2 weeks, the residents were much more receptive to this type of product.

A lengthy discussion then ensued about the appearance of the wall. By popular acclaim, the residents opted for the FANWALL product with a mason-cut stone finish on the side facing them. They wanted it to be colored a desert-sand beige and indicated no concern for the general appearance on the highway side. In addition, it was suggested and agreed on that a raked finish on the highway side might discourage graffiti.

The residents present were also given a legal document to sign that indicated that they had given up access rights directly to 54th Avenue South (which no one currently used) and all rights of light, air, and view to a height not to exceed 10 ft above natural ground. They also were to agree to allow FDOT a perpetual easement for the purpose of maintaining the wall; this agreement also spelled out the rights of the property owner to connect fencing to the completed wall and to have any damage to vegetation or improvements arising out of the construction of the wall repaired by FDOT without any cost to the homeowner. After FDOT legal and right-of-way staff reviewed the agreement with residents, the property owners were encouraged to take it home, study it, present it to their lawyer (if desired), sign it, and return it promptly to FDOT. To aid in this effort, FDOT right-of-way agents were assigned to the task of contacting each property owner to assist them in completing the indenture.

FINAL DESIGN AND PROCESSING

While the right-of-way documents were being processed, the effort to complete the design of the

wall continued. The FANWALL Corporation was asked to prepare a final wall design that would incorporate the decisions made at the second workshop, and this design was submitted to the contractor. The contractor then submitted a price quotation to FDOT; however, this quotation was considerably higher than FDOT's estimates.

After negotiation, the contractor submitted a revised price quote within FDOT's estimated range and on November 8, 1983, a supplemental agreement between FDOT and the contractor was signed. This contract called for the project to be completed in 14 working days. After the contract was signed, the FANWALL Corporation located a form-liner in the pattern selected, secured a precasting contractor, and began the process of casting the barrier wall panels (65 in all). The precasting operation took approximately 1 1/2 months to complete. During that interval, the residents were kept informed of the wall's progress through letters and telephone calls to key homeowners and by personal contact with FDOT construction personnel.

CONSTRUCTION PROCESS

Prior to the beginning of the noise barrier's installation, the property owners were contacted by FDOT personnel and advised that construction would begin on or about March 12, 1984. They were informed that if they wanted existing fences removed by the contractor, they were to make this request known to FDOT construction personnel. On March 8, 1984, the contractor began removing fences and preparing the base for the installation of the noise wall. The actual installation began March 13 and was completed March 20, 1984; during the process of the wall's construction, no significant problems occurred. The final appearance of the wall is shown in Figure 6.

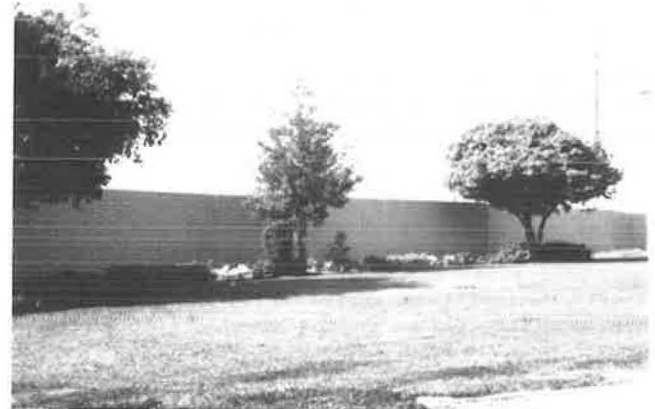


FIGURE 6 Photograph of noise barrier wall after construction.

COMMUNITY REACTION

A survey was formulated and distributed to the residents to determine their level of satisfaction or dissatisfaction with FDOT regarding the noise abatement wall. A copy of the survey form and the results are given in Figure 7.

The survey form was hand-delivered to each available resident, including those adjacent to the wall on the eastern end who elected not to have the wall in front of their property. After a brief explanation of the purpose of the survey, it was left with the resident to fill out with the understanding that

ST. PETERSBURG POST-BARRIER CONSTRUCTION SURVEY
54TH AVENUE SOUTH STATE JOB NO. 15190-1422

Date April 23-25, 1984

Name _____ Address _____

Intro- My name is Win Lindeman with the Florida Department of Transportation. I am conducting a follow-up survey regarding your feelings about noise abatement along 54th Avenue South.

1. Were you satisfied with the information concerning the noise barrier that was available prior to the Department of Transportation decision to construct it?
(check one)
 - 7 Very Satisfied
 - 1 Somewhat Satisfied
 - Neither Satisfied
 - Nor Dissatisfied
 - 1 Somewhat Dissatisfied
 - Very Dissatisfied

2. Did you agree with the Department of Transportation decision to construct a noise barrier at that time?
(check one)
 - 7 Yes
 - 2 No
 - Had No Opinion

3. Was the barrier efficiently constructed so that it caused the least possible disruption to the area?
(check one)
 - 7 Very Efficient
 - 1 Somewhat Efficient
 - 1 Neither Efficient
 - Nor Inefficient
 - Somewhat Inefficient
 - Very Inefficient

4. Is the barrier effective in reducing traffic noise in your yard?
(check one)
 - 2 Very Effective
 - 6 Somewhat Effective
 - 1 Neither Effective
 - Nor Ineffective
 - Somewhat Ineffective
 - Very Ineffective

5. Are you satisfied with the general appearance of the noise barrier?
(check one)
 - 6 Very Satisfied
 - 1 Somewhat Satisfied
 - 2 Neither Satisfied
 - Nor Dissatisfied
 - Somewhat Dissatisfied
 - Very Dissatisfied

6. In your opinion, has the construction of the noise barrier affected the value of your property?
(check one)
 - 1 Increased Value
 - Greatly
 - 4 Increased Value
 - Somewhat
 - 3 Neither Increased Nor
 - Decreased Value
 - Decreased Value
 - Somewhat
 - Decreased Value
 - Greatly

7. Indicate whether you have experienced any of the following frequently mentioned benefits of reduced traffic noise since the construction was completed?
(check one or more)
 - 1 Don't Know
 - 4 Conversation Is
 - Easier
 - 3 Improved Sleeping
 - Conditions
 - 6 More Relaxing
 - Environment
 - 4 Open Windows Fair
 - Weather
 - 1 Use Yard More
 - Other, _____
 - None

8. Indicate whether you have experienced any of the following frequently mentioned non-noise related benefits since the construction was completed.
(check one or more)
 - 3 Cleaner Air
 - 6 Improved Privacy
 - 1 Improved View
 - Lawn/Shrubs Grow
 - Better
 - 1 Sense Of Ruralness
 - Other, _____
 - None

FIGURE 7 Survey questionnaire after construction of wall and summary of results.

9. Indicate whether you have experienced any of the following frequently mentioned disadvantages of noise barriers since the construction was completed.
- (check one or more)
- 2 Creates Closed-in Feeling
 - 1 Destroys Area Environment
 - 2 Limits/Restricts View
 - 1 More Yard Maintenance
 - 1 Visual Eyesore; Un-sightly
 - Other, _____
 - 4 None
10. In your opinion, do the benefits of constructing noise barriers outweigh the disadvantages?
- (check one)
- 5 Very Beneficial
 - 2 Somewhat Beneficial
 - 1 Neither Beneficial Nor Disadvantageous
 - 1 Somewhat Disadvantageous
 - Very Disadvantageous

If you have any additional comments or suggestions about either the noise barrier program or traffic noise reduction in general, please feel free to include them here. Thank you. Your help is sincerely appreciated.

FIGURE 7 continued.

the form would be picked up later the same day or on the following day. Only two residents failed to fill out the survey form. One of the two had moved out of the neighborhood and the other declined to complete the survey despite several attempts to solicit her input.

As noted previously, the results of the post-construction survey are given in Figure 7. As expected, the results indicated a high degree of satisfaction with the way FDOT presented the information concerning the noise wall and with the decision to build it. Considerable satisfaction with the method of construction was also shown. However, the effectiveness of the barrier at reducing the traffic noise level was not rated as high as might have been hoped for. Because the height of the wall was selected by the residents, their expressed willingness during the first workshop to forego reduction in effectiveness in favor of a lower wall may have led to the modest degree of effectiveness perceived. Concerning appearance of the wall, respondents generally said they were "very satisfied" (recall that the residents also had the opportunity to select the appearance themselves).

The most frequently noted effect on the value of the property was that the noise barrier probably increased it somewhat. The major benefits of having the wall were found to be a more relaxing environment, easier conversation and sleep, and more opportunities to enjoy open windows. Other benefits receiving high ratings were improved privacy and cleaner air. Several residents mentioned that a disadvantage of the wall was that it created a closed-in feeling and limited their view. In the final analysis, most of the residents found the wall to be "very beneficial."

Several residents took the time to write additional comments that expressed their feelings more adequately than they were able to by using the survey form. One resident noted that he appreciated the concern and courtesy of FDOT staff, but wished that the wall had been put up before the beginning of the general construction activities. Another resident

noted the efficiency and cooperativeness of the contractor's staff, even though she felt she was going to get more sod installed than was placed. Two residents noted that the wall was very effective at stopping trash and dust from the highway littering their yards. Another resident noted that during the application of the Class 5 finish on the highway side, some overspray was found on his patio furniture and in the pool; nevertheless, he stated that the wall had a very positive impact on their property. Two of the residents who did not favor the wall but went along with it commented on the need to be good neighbors and how they would learn to live with the noise barrier.

CONCLUSIONS

Based on the results of the FDOT effort to involve the community in decision making about a noise barrier, three conclusions can be stated with some level of confidence. First, early public involvement can overcome minor irritations during the construction phase. Second, opening lines of communication in the decision-making process can greatly enhance the acceptability of the noise barrier after the installation is complete. Finally, even though all efforts are reasonably expended, total satisfaction with this process is highly unlikely. To enhance satisfaction, it is strongly suggested that the barrier be built early in the roadway construction process to help reduce the impact of construction noise and dust.

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Comparison of Noise Barrier Insertion-Loss Methodologies

WIN LINDEMAN

ABSTRACT

Field measurements were conducted before and after the construction of a noise barrier in St. Petersburg, Florida. These noise measurements were made to determine the effectiveness of the barrier by the use of a proposed standard methodology for determining insertion loss. Two methods were used: direct and indirect measured. A computer prediction was also conducted for comparative purposes. Close correlation was found between the two methods and the computer prediction. A recommendation was made to use the computer prediction technique in most instances and the direct method in those cases in which public interest in the barrier is high.

The objectives of the research study were (a) to provide the Florida Department of Transportation (FDOT) with information about the effectiveness of a noise barrier wall built along 54th Avenue South in St. Petersburg and (b) to provide the American National Standards (ANS) Working Group S12-6 with information on the effectiveness of their proposed Standard Method for Determining Insertion Loss of Outdoor Noise Barriers (1).

STUDY LOCATION

To achieve the objectives stated in the preceding paragraph, a before-and-after series of field measurements was planned to determine the insertion loss from the construction of a highway noise barrier wall. The site selected for the field measurements was located along 54th Avenue South in St. Petersburg, Florida. This state highway runs east and west and serves as the major access route to the beaches of southern Pinellas County (see Figure 1).

The existing level of roadway traffic is being increased as a result of an interchange with Interstate 275 as it progresses southward through St. Petersburg. The roadway is bordered on the north by a residential neighborhood known as Maximo Moorings between 37th Street South and 41st Street South. On the south side of this roadway is an open area where a city wastewater treatment plant and Eckerd College are located. The Maximo Moorings neighborhood was selected because of the impending construction of a noise barrier wall at this location and the availability of an existing roadway for before-and-after measurements. In addition, the availability of three vacant lots on which direct before-and-after measurements could be conducted and an equivalent site within 650 ft of the direct site location enhanced the desirability of this location for this type of study. The physical terrain is flat and, on first assessment, met all of the apparent requirements for the ANS study. The homes along the roadway are all single story, single family dwellings that have