

204 Cleveland Lane  
Rockaway, NJ 07866  
732-259-4727  
[PKardos1@yahoo.com](mailto:PKardos1@yahoo.com)

12/20/14

Jamie Fox, Commissioner  
NJ Department of Transportation  
P.O. Box 600  
Trenton, NJ 08625-0600

Dear Commissioner Fox:

I am a NJ resident concerned with the noise from I-80 near exit 35B.

A *Conceptual Noise Barrier Feasibility Study*<sup>1</sup> in 2003 found, “that it is not possible for barriers to be constructed feasibly and cost effectively to protect the Fox Hills Development.”

I have reviewed this study and find that the study does not follow accepted methodologies (attachment 1). When accepted methodologies are followed, barriers are indeed feasible and reasonable (attachment 2). If NJ had a priority system similar to other states, I’m certain that construction of noise barriers near I-80 Exit 35 would be one of the most reasonable expenditures for noise reduction as any in NJ.

Please examine the study attached (attachment 2), or conduct a new study of your own following accepted methodologies, and compare it with the study attached. If there are differences, I’m sure they can be resolved so that we have a study acceptable to all that then can be used for further noise barrier decisions.

Very truly yours,



Paul Kardos  
NJ PE License 24GE02470500

Copies:     Senator Joseph Pannaccio  
              NJ DCA Commissioner John M. Case  
              NJDOT Resident Engineer Alexander Borovskis

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<sup>1</sup> The 2003 study is available for download at [I80Noise.weebly.com](http://I80Noise.weebly.com)

**Flaws in the “study”**

The *Conceptual Noise Barrier Feasibility Study, I-80 Westbound Vicinity of Exit 35*, dated April 2, 2003, herein referred to as the “study,” has the following flaws:

<p><b>#1</b> <b>Sound Receptor Flaw</b></p>	<p><b>The Study:</b> The sound <i>receptor</i> determines one end of the “line of sight.” The “study” considers receptors only at 3<sup>rd</sup> story units.</p> <p><b>Accepted Methodology:</b> <i>Highway Design Manual</i><sup>1</sup> states, “The noise barrier should not be designed to shield more than the first story of multi-story residences unless it provides a minimum reduction of 5 decibels for a substantial number of residences at a reasonable increase in cost.”</p> <p><b>Conclusion:</b> The accepted methodology then is to examine the 1<sup>st</sup> story to see if noise barriers are justified and then check higher levels – not start at the highest level and, if not justified, give up entirely.</p>
<p><b>#2</b> <b>Sound Generator Flaw</b></p>	<p><b>The Study:</b> The sound <i>generator</i> determines the other end of the “line of sight.” The “study” uses a “truck exhaust 13 ft off highway” as the sound <i>generator</i>.</p> <p><b>Accepted Methodology:</b> Caltrans <i>TeNS</i><sup>2</sup> Figure 5-4 uses 8 ft. for an HT (heavy truck) and 0 ft. for an Auto.</p> <p><b>Conclusion:</b> The “study” should use 8 ft. above the pavement as a worst case for the sound <i>generator</i> location, not 13 feet.</p> <p>Note: There’s an interesting discussion of why 11.5 feet should not be used for noise predictions in Caltrans <i>TeNS</i> p. 5-19. Also of interest is <i>Noise Pollution</i><sup>3</sup>, “The noise due to contact between the tires and the road surface becomes dominant at high speeds.”</p>
<p><b>#3</b> <b>Barrier Height Flaw</b></p>	<p><b>The Study:</b> The “study” states, “noise barrier height generally needs to be limited to approximately 20 feet.”</p> <p><b>Accepted Methodology:</b></p> <ol style="list-style-type: none"><li>1. The US Dept. of Transportation states<sup>4</sup>, “Walls ... are usually limited to 8 meters [26.24 ft] in height because of structural and aesthetic reasons.”</li><li>2. Many barriers on I-80 are 24-26 feet.</li></ol> <p><b>Conclusion:</b> Noise barriers are not limited to 20 feet.</p>

Paul Kardos  
NJ PE License 24GE02470500

<sup>1</sup> *Highway Design Manual, Chapter 1100 Highway Traffic Noise Abatement*, 05-07-12/Sept. 1, 2006,, p. 1100-3.

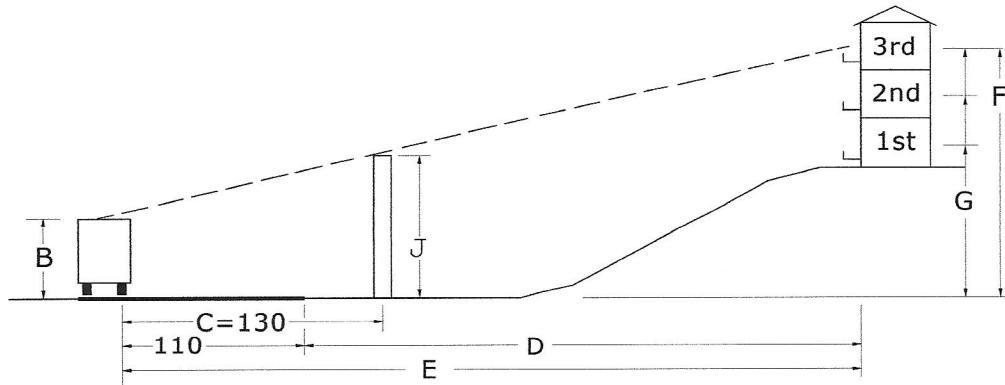
<sup>2</sup> *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, by Calif. DOT, Sept 2013, p. 5-8.

<sup>3</sup> *Noise Pollution: Effects and Control*, by A. Lara Saenz and R. W. B. Stephens, Oct. 22, 1986, p. 297.

<sup>4</sup> *Highway Traffic Noise Analysis and Abatement Policy and Guidance* by US DOT, FHWA, Office of Environment and Planning, Washington, DC, June 1995, p. 25

Site	B	C	D	E	F	G	H	J
	Noise source height	Distance: noise source to barrier	Distance: receptor to road edge	Distance: noise source to receptor	Height: 3rd floor above highway pavement	Height: receptor above highway pavement	Height: receptor above noise source	Barrier Height
Roosevelt 1st floor	8	130	350	460	52	32	24	14.8
Roosevelt 2nd floor	8	130	350	460	52	42	34	17.6
Roosevelt 3rd floor	8	130	350	460	52	52	44	20.4
Grant 1st floor	8	130	220	330	46	26	18	15.1
Grant 2nd floor	8	130	220	330	46	36	28	19.0
Grant 3rd floor	8	130	220	330	46	46	38	23.0
Wilson 1st floor	8	130	250	360	50	30	22	15.9
Wilson 2nd floor	8	130	250	360	50	40	32	19.6
Wilson 3rd floor	8	130	250	360	50	50	42	23.2

- B 8 ft per California Technical Noise Supplement
- C 130 ft (from 2003 Noise Feasibility Study)
- D from 2003 Noise Feasibility Study
- E to D add 110 ft for road edge to farthest eastbound lane
- F Elevation difference from Route 80 to the 3rd floor balcony (from 2003 Noise Feasibility Study)
- G for 2nd floor height, subtract 10 ft from 3rd floor, subtract 20 ft for 1st floor
- H subtract B from G
- J calculated barrier height to block line of sight,  $J = H * C / E + B$  (barrier will be shorter if on berm or hill)



**Reasonableness Calculation:**

**Impacted/benefitted receptors:**

Roosevelt south side:	21	(all residences)
Roosevelt north side:	6	(ends only)
Grant east side:	10	(partially blocked by existing hill)
Grant west side:	20	(all but 1st floor at end)
Wilson east side:	20	(all but 1st floor at end)
Wilson west side:	17	(partially blocked by existing hill)
<b>Total:</b>	<b>94</b>	

Note: allowance per receptor is \$50,000 (from NJDOT Traffic Noise Management Policy and Noise Wall Guidelines, Effective July 1, 2011)

Reasonableness = allowance per receptor \* number of benefitted receptors  
 = \$50,000 \* 94 = **\$4,700,000**