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*Sound & Vibration
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18 January 2021

L 21888
J/N 728

Ms. Maryann Dillon
Housing Initiative Partnership, Inc.
6525 Belcrest Road, Suite 555
Hyattsville, Maryland 20782

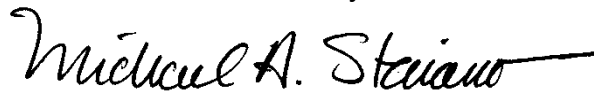
Subject: Md. Rte. 5 Preliminary Traffic Noise Exposure Gradient Estimation
Schultz Road Senior—Clinton, Maryland

Dear Ms. Dillon:

The estimated noise exposure from Md. Rte. 5 traffic was mapped in the vicinity of the proposed Schultz Road Senior development at 8230 Schultz Rd. using state-of-the-art U.S. Federal Highway Administration noise prediction procedures. The results found that with the presence of the proposed building the predicted sound levels at a rear patio area will be considerably less than 65 dBA. Thus, the patio exposure is well within the U.S. Department of Housing and Urban Development "acceptable" range.

The details of this study are documented in the attached report. If you have any questions or if I can be of further help, please let me know.

Sincerely,



Michael A. Staiano

Attachment: Staiano Engineering Report No. L 21888

xc: J.H. Ratnow—Site-Insight
B.M. Caison—Ben Dyer Associates, Inc.

**MD. RTE. 5
PRELIMINARY TRAFFIC NOISE EXPOSURE GRADIENT ESTIMATION
SCHULTZ ROAD SENIOR
CLINTON, MARYLAND**

By


Michael A. Staiano

Report No. **L 21888**

18 January 2021

For

Housing Initiative Partnership, Inc.
Hyattsville, Maryland
J/N 728

On 11 August 2020, Staiano Engineering reported the estimated noise from Md. Rte. 5 traffic at the proposed Schultz Road Senior development using U.S. Department of Housing and Urban Development (HUD) prediction procedures. The assessment found the exposure to be “normally unacceptable” with respect to HUD exterior noise criteria.¹ Consequently, the proposed building architecture was evaluated and recommendations made to meet acceptable interior sound levels.²

The August 2020 report noted that the patio area immediately adjacent to the rear façade of the senior building is well shielded by the building such that MD-5 traffic noise there is unlikely to exceed 65 dBA due to the noise barrier benefit of the structure. However, noise prediction analyses were not performed at this location. Subsequent MNCPPC review of the noise study requested delineation of “mitigated noise contours” including the patio area. This report provides a map of the expected Rte. 5 traffic noise on the site with the shielding provided by the senior building.

SUMMARY

The estimated noise exposure from Md. Rte. 5 traffic was mapped in the vicinity of the proposed Schultz Road Senior development at 8230 Schultz Rd. using state-of-the-art U.S. Federal Highway Administration noise prediction procedures. The results found that with the presence of the proposed building the predicted sound levels at a rear patio area will be considerably less than 65 dBA. Thus, the patio exposure is well within the U.S. Department of Housing and Urban Development “acceptable” range.

PREDICTED SOUND LEVELS

Analysis Procedures

The FHWA Traffic Noise Model (TNM) provides the most accurate traffic noise predictions currently obtainable and has the capability of mapping the spatial distribution of traffic noise exposure. TNM utilizes the most up-to-date vehicle noise emission levels, makes possible the detailed representation of topographic features, and considers the effects of hard (that is, sound-reflective) surfaces and soft (sound-attenuating) ground.³ The TNM computer program (Version 3.0) was the computational procedure used in this evaluation.

The accuracy of the HUD computational procedure used in the earlier report was tested in a systematic comparison of its results to output from the TNM procedure (Version 2.5).⁴ The HUD procedure was found to over-predict TNM results for all roadway geometries and conditions. Consequently, the noise exposure magnitudes estimated in this study can be expected to be less than to those reported previously using HUD methodology.

Sharply drawn contour *lines* can be misleading. Such “contours” may be reasonably accurate if the adjacent topography is fairly flat and unshielded. However, site topography and features, such as buildings and noise barriers, can produce very irregular noise exposures and result in highly misleading contour shapes. Furthermore, the uncertainty inherent in traffic noise prediction effectively widens the contour line such that its *thickness* may be 40% or more of its distance from the roadway. As a practical consequence, the details of a finely drawn contour line often are meaningless.⁵ For this reason, TNM represents the spatial distribution of traffic noise exposure with *color gradients* and does not provide for contour *lines*.

Predictions were based upon six-lane, divided MD-5 roadway geometry and the 2040 traffic data as in the August 2020 report. This analysis included the shielding benefit of the building structure to the approximately 30 x 50-ft patio immediately adjacent to the rear façade of the senior building.* Otherwise, the surrounding topography was rudimentarily represented as a flat, soft (lawn) ground plane with 5-ft receptor height—comparable to the HUD noise estimation procedure.

Analysis Results. The estimated spatial distribution of day-night average sound levels from Rte. 5 is shown in Figure 1. The expected sound level at the patio area is about 50 dBA[L_{dn}][—]well below the 65-dBA limit. Thus, the roadway noise exposure for the Shultz Road Senior project patio area as proposed is “acceptable” per HUD criteria and requires no mitigation.

* per site/architecture concept plans (CDA APPLICATION_Schultz Road-R18_LR-Rendering 3-19.pdf received 10 April 2020)

Qualifications. The results of measurements or predictions of noise or vibration magnitudes or changes in level apply only to the evaluated dates and times, locations, and conditions. Exposure uncertainty exists such as due to but not limited to variable outdoor propagation, undefined transmission paths, or fluctuating source operation. Assessments of human response to noise or vibration are subject to exposure uncertainties and the varying perceptions of individual sound or vibration receivers. Noise or vibration performance is significantly degraded by poor implementation practice. The execution of any recommendations requires the proper selection and installation of materials and equipment. Good workmanship in the construction or modification of equipment, structures or buildings is necessary. The findings or conclusions may not apply if the implementation of the recommendations differs in any way.

REFERENCES

- ¹ Staiano, M.A., "Md. Rte. 5 Preliminary HUD Noise Estimate—Shultz Road Senior—Clinton, Maryland," Staiano Engineering Rpt. No L 20885, 11 August 2020.
- ² Staiano, M.A., "Md. Rte. 5 Traffic Noise Soundproofing Evaluation—Shultz Road Senior—Clinton, Maryland," Staiano Engineering Rpt. No L 20887, 20 October 2020.
- ³ Hastings, A.L, Traffic Noise Model 3.0—Technical Manual, U.S. Dept. of Transportation Report No. FHWA-HEP-20-012 , December 2019.
- ⁴ Staiano, M.A., "Simple Methods for Estimating Highway Noise," Paper Presented to the Transportation Research Board, Committee ADC40—Transportation-Related Noise and Vibration—Summer Meeting, 24 July 2007.
- ⁵ Staiano, M.A., "Representing Highway Noise Exposures—Downfall of Contourtationists," Sound & Vibration Magazine, Vol., 40, No. 8, August 2006.

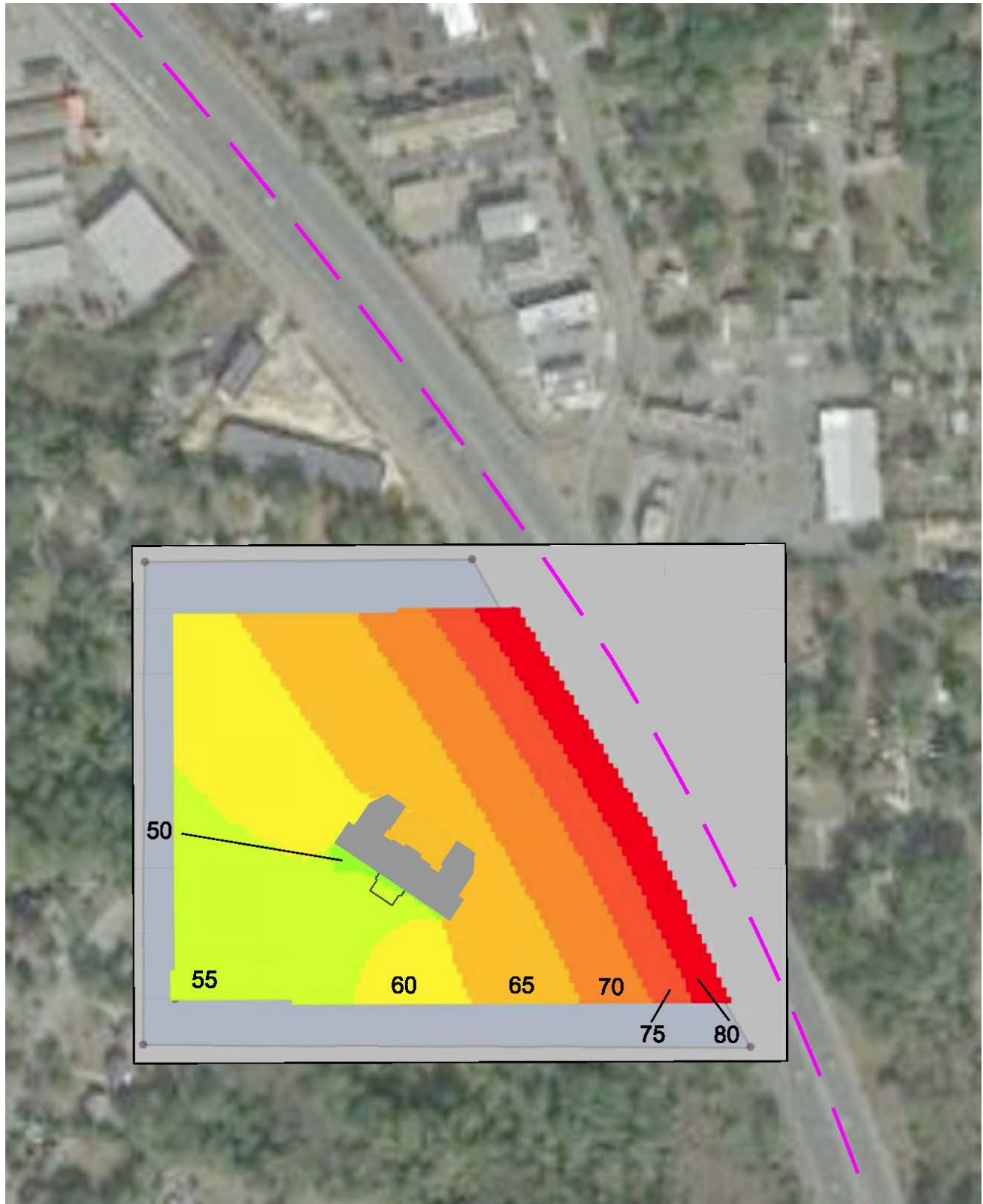


Figure 1. ESTIMATED NOISE EXPOSURE at
SCHULTZ ROAD SENIOR from MD. RTE. 5
outdoor *day-night* average sound levels (L_{dn}) based upon Md. Rte. 5 2040 traffic