

Critique of RSG Noise Assessment

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This critique of the RSG Noise Assessment dated April 20, 2020, concerning the HUB Project consists of three parts.

First, the RSG report is **not comprehensive** because it failed to assess noise with respect to all the relevant sections of the Burlington and South Burlington Noise Ordinances and it failed to consider all relevant noises and noise impacts, particularly on sleep disruption and interference.

Second, RSG's very limited **noise analysis was flawed** because it inappropriately used a one hour average noise level to assess nighttime noise impacts and did not assess impacts at the property line.

Consequently, the DRB cannot make an affirmative finding with respect to nuisance impacts of noise.

Third, the RSG model on which its findings are based, is a black box that produces results the DRB and the neighbors cannot understand without examining the modeling and monitoring data. Consequently, the **DRB should require that the modeling and monitoring be provided** to the neighbors. Specifically:

1. All noise modeling files.
2. All noise monitoring data from Higher Ground, including raw data and monitoring notes.
3. All monitoring data used to determine the background noise levels, including raw data and monitoring notes. If the background data is actually based on modeling, all background modeling files.

If the modeling and monitoring data are not provided, the DRB should not consider the modeling results reliable and conclusions based on the modeling or monitoring should not be used in the DRB process.

Part 1: The RSG Noise Assessment Is Not Comprehensive

The RSG report claims that "the proposed concert venue can be constructed and operated in such a way as to comply with Sec. 21-13 **(b) (1)** of the Burlington Noise Control Ordinance" (page 1, **emphasis added**).

The Burlington Noise Ordinance is found in Sec. 21-13 of the Burlington Code of Ordinances. Sec. 21-13 **(b) (1)**, the section RSG claims to have considered, contains the *General Prohibition*. Sec. 21-13 **(b) (2)** contains two *Express Prohibitions* that are directly relevant to HUB Project noise that were not considered by RSG.

The relevant parts of the Burlington Noise Ordinance are (highlighting added):

21-13 (b) Prohibited noise offenses:

(1) *General prohibition.* It shall be unlawful for any person to make or cause to be made any loud or unreasonable noise. Noise shall be deemed to be unreasonable when it disturbs, injures or endangers the peace or health of another or when it endangers the health, safety or welfare of the community. Any such noise shall be considered to be a noise disturbance and a public nuisance.

(2) *Express prohibitions.* The following acts, which enumeration shall not be deemed to be exclusive, are declared to be noise disturbances:

a. Radios, television sets, musical instruments, phonographs and similar devices. The operation or permitting the use or operation of any musical instrument, radio, television, phonograph, or other device for the production or reproduction of sound in such a manner as to be plainly audible through walls between units within the same building, from another property or from the street between the hours of 10:00 p.m. and 7:00 a.m. or in such a manner as to unreasonably disturb the peace, quiet or comfort of the public.

c. Parties and other social events. Notwithstanding section (b)(1), it shall be unlawful for any person who is participating in a party or other social event to actively make unreasonably loud noise. A party or other social event is defined as a gathering upon the premises of one or more persons not residing at the premises. Unreasonably loud noise is noise that unreasonably interferes with the peace or health of members of the public or is plainly audible between the hours of 10:00 p.m. and 7:00 a.m. through the walls between units within the same building, from another property or from the street. It shall also be unlawful for any resident of a premises to allow a party or other social event occurring in or about the premises to produce unreasonably loud noise. There is a rebuttable presumption that all residents of the premises have allowed such party or other social event to occur in or about the premises. All residents of the premises are responsible for such unreasonable noise made, each having joint and several liability.

Both Sec. 21-13 (b) (2) (a) and (c) require that noise from musical instruments, devices for the production or reproduction of sound, or events from the HUB not be plainly audible from the street or at other properties between 10:00 p.m. and 7 a.m. The RSG report actually recognizes the relevance of 21-13 (b) (2) (a) in the Report, citing the requirement on page 4, Local Standards. **Yet, nowhere does the report provide an assessment of compliance with this *Express Prohibition*.** There is, for example, no discussion of whether noise will be detectable.

Ignoring the *Express Prohibitions* in the Burlington Noise Ordinance is an unjustifiable omission. Burlington, Vermont is a college town, and the *Express Prohibitions* are arguably the most important

provisions in the Burlington Noise Ordinance. The town cannot be seen selectively enforcing the *Express Prohibitions* without crippling its response to noise from college students.

The RSG report made the same mistake with respect to the South Burlington noise regulations. The South Burlington regulations have nearly identical prohibitions to the Burlington Noise Ordinance. The relevant parts of the South Burlington Public Nuisance Ordinance are:

(3)(C)

(1) Operating or permitting the use or operation of any musical instrument, radio, television, phonograph, or other device for the production or reproduction of sound in such a manner as to be plainly audible through walls or floors between units within the same building, from another property or from the street between the hours of 10:00 p.m. and 7:00 a.m. or in such a manner as to unreasonably disturb the peace, quiet or comfort of the public.

(3) Notwithstanding section (3)(B), it shall be unlawful for any person who is participating in a party or other social event to actively make unreasonably loud noise. A "party or other social event" is defined as a gathering upon the premises of one or more persons not residing at the premises. Unreasonably loud noise is noise that unreasonably interferes with the peace or health of members of the public or is plainly audible between the hours of 10:00 p.m. and 7:00 a.m. through the walls between units within the same building, from another property or from the street. It shall also be unlawful for any resident of a premises under his or her control to allow a party or other social event occurring in or about the premises to produce unreasonably loud noise. There is a rebuttable presumption that all residents of the premises have allowed such party or other social event to occur in or about the premises. All residents of the premises are responsible for such unreasonable noise made, each having joint and several liability.

With the omission of significant and relevant *Express Prohibitions* in the Burlington and South Burlington Noise Ordinances, the RSG report cannot be considered "comprehensive" and does not support an affirmative finding with respect to noise.

The RSG report is also not comprehensive in another way. It did not evaluate noise caused by the HUB project that would have significant nighttime impacts. In particular:

1. The assumption that the only noise from a 1,500 person audience and a 2,000 plus square foot outdoor patio will be a mere 15 voices, particularly before the concert, during intermissions, and at the end of the concert, is not credible.
2. No assessment of the noise of motorcycles, trucks, and buses leaving the HUB during the night was made, particularly with concern for sleep interference or awakenings.
3. No assessment of noise escaping the open doors was made.
4. At the end of a concert, when more than a thousand people who have been drinking and have suffered a temporary threshold shift in their hearing ability leave, they will not file out like monks following evening prayers. Noise of people leaving at 2 a.m. (and its impact on sleep loss) was not assessed in any credible way.
5. No assessment of low frequency noise escaping the HUB was made. Low frequency noise is critical to understanding impacts on neighbors as it more easily penetrates walls and homes.

Part 2: RSG's Very Limited Noise Analysis Was Flawed because It Inappropriately Used a One Hour A-Weighted Average Noise Level to Assess Nighttime Noise Impacts and Did Not Assess Impacts at the Property Line.

There are dozens of noise metrics available to evaluate noise impacts. These include the Lmax, the maximum instantaneous level; the L90, a statistical measure of the background noise; the Leq, an average over a time period; etc. Different metrics have different advantages and disadvantages for describing various noise impacts. The one hour Leq RSG chose to use is poorly suited to investigate sleep interference impacts on a residential neighborhood at 2 a.m. **No one has ever heard a one hour average noise.** What neighbors will hear are instantaneous noise events. **No one is ever awakened by a one hour average noise.** Neighbors are awakened by instantaneous noise. The Lmax is a much better tool for assessing instantaneous noise than the one hour average that hides individual events. The RSG report did not use this metric.

There are many frequency weighting tools that are available to evaluate noise impacts. These include, A-weighting, C-weighting, and several others including octave band measures. Different weighting schemes have different advantages and disadvantages for describing various noise impacts. A-weighting significantly discounts low frequency noise. Amplified music, however, tends to have a very strong low frequency component. And low frequency noise tends to be very intrusive, penetrating walls and homes. Therefore, A-weighting is a particularly poor choice for assessing noise impacts from the HUB Project. The RSG report, however, relied on A-weighting.

The RSG Report appears to have relied solely on these two poorly suited measures of noise (A-weighting and a one hour average) to determine that the HUB Project noise will comply with the *General Prohibition* found in the Burlington Noise Ordinance (see page 18). The claims that the HUB Project noise would not be unreasonable and would not impact the welfare of the community are based on measures of noise poorly suited to determine those particular issues.

Moreover, the RSG Report did not identify noise levels at the key location required for assessing noise with respect to Burlington's zoning and noise regulations. **The appropriate location for noise assessment in both cases is the property line.** The property line noise levels were not relied upon in the RSG report.

Summary of Parts 1 and 2

The RSG report is inadequate and incomplete. It is not comprehensive because the report and its conclusions are based on analysis that omits key *Express Prohibitions* in the Burlington Noise Ordinance, based on inappropriate noise measures, and based on inappropriate impact assessment locations. The report, therefore, does not support an affirmative finding with respect to noise.

Part 3: Noise Modeling Files and Noise Monitoring Data Must Be Provided to Allow Assessment of the RSG Report Claims

The RSG conclusions are based on the RSG noise model of the HUB Project. To the DRB and the neighbors, the model is a black box, in which results are unanalyzable. Even to those with knowledge of noise modeling, the results are unanalyzable, because the inputs are not clear. To avoid this problem the modeling and monitoring files are typically shared with all parties to increase transparency and confidence in the results.

Sharing these data are the only way for neighbors, and ultimately, the DRB, to “check the math” in the RSG report. Assuming that the “math” is accurate, there is no reason for the HUB Project to not share the modeling and monitoring data.

Consequently, the **DRB should require that the modeling and monitoring be provided** to the neighbors, in a timely manner, with sufficient time for the modeling and monitoring to be analyzed and assessed. Specifically, we request:

1. All noise modeling files that produce the same results shown in the RSG report when opened in the appropriate noise modelling software.
2. All noise monitoring data from Higher Ground, including raw data and monitoring notes so that it is clear who measured it, what is measured, when it is measured, where it was measured, under what conditions, and what metrics were used. In particular, it is critical to know the activity measured, including the number of patrons, type of music, number of vehicles, types of vehicles, etc.
3. All monitoring/modeling data used to determine the background noise levels in the neighborhood, including raw data and monitoring notes, so that it is clear who measured it, what is measured, when it is measured, where it was measured, under what conditions, and what metrics were used. In particular, it is critical to know the activity measured/modeled, number of vehicles, types of vehicles, etc.

If the modeling and monitoring data are not provided, the DRB should not consider the RSG modeling results reliable and conclusions based on the modeling or monitoring should not be used in the DRB process.