

Montlake Sound Transit vibrations pre-mitigation survey discussion

Summary:

- Residents along entire route of the tunnel experience unanticipated vibrations
- 57 households reporting this on this survey is less than the actual number
- Night time construction activity is causing significant sleep loss
- Palpable vibrations coming from the earth beneath us cause anxiety
- Efforts to measure vibrations, and map where residents are affected, should be something Sound Transit takes on for all of our benefit

The recent survey found 60 residents in 57 Montlake homes who were experiencing ground-borne vibrations (GBV) or sounds from Sound Transit construction train activities. These homes are found along nearly the entire length of the U-Link tunnel corridor from the Montlake Cut to Interlaken Park.

The percentage of respondents reporting vibration/noise issues was 90% on the Shelby-Hamlin area, 71% in the "hill" of Montlake from Roanoke to Howe, and 76% in the Boyer Basin (Blaine to Interlaken Park) area.

The response rate in the Boyer Basin was 49 of approximately 80 households in the area. Many means to maximize response rate were used in this area, including phone, personal conversation, email and leafleting of homes. We assume that the response rate is lower in other areas of Montlake where not as many residents were likely aware of the survey.

What does this mean? Like most surveys, this one can only hint at the true numbers of affected homes/residents. There are more affected residences in Montlake. Even in the Boyer Basin, the results of this survey under-estimates the true number of affected homes. However, given that people not experiencing vibrations/noise are less likely to take the survey (since there was some surrender of anonymity), the true rates of affected residences within a football field swath of the Sound Transit right-of-way may not be as high as the overall rate of 77% seen in this survey.

When asked how people perceive these phenomena, less than a quarter say they only hear them. 75% claim to both feel and hear these vibrations and sounds.

48 people noticed vibrations/sounds at night (10PM to 7 AM). Of those, 27 reported sleep loss. 13 estimate an hour or less lost sleep per average weeknight, and 14 said it was more, with 2 people reporting 4 hours or more per night of missed sleep.

A reasonable median sleep loss is 1 hour/night. Collectively, that is 135 hours of missed sleep per week. This is a residential neighborhood where people know how to live with high ambient noises from jets, the 520 overpass, street traffic and general neighborhood activities. This much sleep loss among our neighbors is significant, and should it continue, actions will need be taken to rectify the situation.

A subterranean source of vibrations is by itself disconcerting. Humans, like other animals, have ancient programming to fear the earth rumbling. What else may contribute to sleep loss from large vibrations that come from the earth? This is a question that will need to be answered if disruption of sleep patterns persists.

We also asked a question about emotions/feelings. This question is obviously as subjective as it gets, yet it is worth noting that anxiety, fear and irritation were the commonest responses. Should these vibrations/sounds persist into 2012, we feel it will be important to ask specific questions about what residents fear and what makes them anxious.

Sound Transit's experts on vibrations speculate that perceptions may be affected out of proportion due to anxieties about tunneling in general or their feelings about Sound Transit specifically. This survey revealed the majority of respondents favor new improvement in regional mass transit, with more than 70% supporting better mass transit, 64 % prefer the subway approach to mass transit, and more than half of respondents look forward to using the U-Link subway when completed in 2016.

We believe this survey establishes that a significant problem existed in late 2011 in the Montlake neighborhood with unanticipated construction noise from the U-Link tunnel project. It clearly establishes the majority of survey respondents sense these as palpable vibrations/sounds. A minority claim to only hear the sounds these vibrations produce.

The seriousness of the issue is also reflected by Sound Transit's immediate response to neighbors complaining in late August and again in November. Sound Transit promptly announced various vibration mitigation efforts. Yet it seems Sound Transit has been unwilling to back that recognition up with subjective data. We are unaware of any similar survey effort undertaken by Sound Transit. Thus, this may be the only subjective data source should comparisons be required to assess mitigation success rate.

Objectively, it seems Sound Transit's efforts have been aimed at proving there is no significant problem. Sound Transit's sound/vibration studies reject the notion these vibrations are perceptible, in direct opposition to the finding of this survey. Results from two studies, conducted in selected locations under carefully controlled circumstances, claim people should not be able to feel the vibrations being measured. The audible sounds these vibration produce is acknowledged, but compared to various standards, and to ambient noises in the neighborhood, and thus dismissed. So far, there seems to be no evidence Sound Transit has installed equipment to continuously monitor vibrations at any location along its U-Link light rail corridor.

A major point of this effort to gather data is to urge Sound Transit to start doing so on their own. We hope the results of this survey and other, objective data gathering efforts by Montlake citizens will encourage Sound Transit to take GBV that disturb residents more seriously.

All survey participants had to be willing to give their home or business address. These addresses and whether they sensed vibration problems or not were shared with Sound Transit and with City of Seattle officials. We are aware that Sound Transit has its own maps of residences where people have complained. We urge Sound Transit to combine the data from this survey with their own and release a comprehensive map of affected and unaffected residences along the entire tunnel route through Montlake. We know this is no small effort, but our own efforts to do this in the Boyer Basin have already hinted at very odd patterns of vibration distributions, patterns that have nothing to do with proximity to the actual tunnels, and which need explaining.

We hope Sound Transit identifies the reasons for these vibrations and studies unusual propagation patterns. We hope Sound Transit gathers comprehensive vibration data to support scientific theories about why they exist, and uses this to develop fact-based, reasoned approaches to mitigation now and in the future.

Following lawsuits and property damage in tunneling on Beacon Hill, Sound Transit now invests a huge effort in monitoring for soil displacements along the tunnel route. We want Sound Transit to invest a small fraction of this expense on monitoring for these disturbing ground vibrations, both with instrumentation and with accurate reporting of affected residences. We wish for Sound Transit to be a good neighbor in Montlake who doesn't require ever-escalating pressures to behave responsibly.

Respectfully,

Jeff Parke & Kari Olson
Montlake residents