

**CITY OF SEATTLE
ANALYSIS AND DECISION OF THE DIRECTOR OF THE
DEPARTMENT OF CONSTRUCTION AND INSPECTIONS**

Major Public Project Construction Noise Variance

Application: Request for a Major Public Project Construction Noise Variance (“Noise Variance”) from the maximum permissible sound level requirements of the Noise Control Code, Seattle Municipal Code (“SMC”) Chapter 25.08, during construction of the State Route 520 Bridge Replacement and HOV program. This Noise Variance application pertains only to construction activities that need to take place during nighttime hours as those hours are defined in SMC 25.08.

Project No.: 3027364

Site Address: State Route 520

Applicant: Washington State Department of Transportation (“WSDOT”)

SUMMARY OF PROPOSED ACTION

The next SR 520 project phase, the Montlake Phase, includes constructing the West Approach Bridge South, Montlake lid and interchange, and a bicycle/pedestrian land bridge over the highway. Construction of the next phase of the I-5 to Lake Washington Project (the “Rest of the West”) is scheduled to begin in 2018.

The existing SR 520 west approach bridge is built on hollow columns, which are vulnerable to a catastrophic failure during a large earthquake, and the roadway has narrow shoulders and lacks transit/HOV lanes. The West Approach Bridge South (WABS) is a companion to the nearly completed West Approach Bridge North (WABN) and will connect eastbound traffic from Montlake to the new floating bridge. It will also feature a dedicated transit/HOV lane that will provide improved mobility for buses and carpools as they access the new floating bridge and continue to the Eastside.

The new Montlake interchange and lid will include direct-access connections for transit and HOV in addition to new bicycle and pedestrian connections to existing regional and local trails and routes. The Montlake lid will be a hub for local and regional transportation connectivity, and will include multifunctional open spaces, urban trails, under-crossings, a segment of the regional shared-use path adjacent to SR 520, and transit connections. The land bridge will be a bicycle/pedestrian path over SR 520 that provides a north-south local trail connection across the highway between the Washington Park Arboretum and points north. The Montlake Phase also features construction of storm water treatment sites that will capture and naturally filter highway runoff to help protect the local environment.

The Montlake Phase will be a design-build contract. WSDOT has carefully reviewed the work to be built as part of this contract and has developed an expected list of construction activities and an estimated schedule for this work as described below:

- Waterline installation, estimated 5 to 7 months;
- Demolition of existing Montlake Boulevard bridge, estimated 1 month;
- Demolition of existing 24th Avenue Bridge, estimated 1 month;
- Demolition of existing West Approach Bridge, estimated 4 to 6 months;
- Temporary work bridge construction, estimated 5 to 7 months;
- Drilled shafts for WABS, estimated 12 to 16 months;
- Bridge substructure and superstructure construction for WABS, estimated 14 to 20 months;
- Construction of Montlake lid, estimated 48 to 60 months;
- Traffic shifts, estimated 48 to 60 months;
- Utility relocation, estimated 48 to 60 months;
- Temporary shoring wall construction, estimated 48 to 60 months; and
- WABN widening, estimated 48 to 60 months.

On March 6, 2017, WSDOT submitted a complete application for this Noise Variance to the Seattle Department of Construction and Inspections (SDCI); on July 6, 2017, a revised application was submitted (collectively the “application”). The Noise Variance was requested pursuant to SMC 25.08.590 and 25.08.655 to allow construction noise generated on site to exceed the maximum permissible sound level during nighttime hours — between 10:00 p.m. and 7:00 a.m. on weekdays and between 10:00 p.m. and 9:00 a.m. on weekends and legal holidays — as specified in SMC 25.08.410 - 25.08.425. These provisions of the Code limit nighttime project sound levels (hourly Leq) generated and received in residentially-zoned districts to 45 dBA.

Based on the current anticipated construction schedule, nighttime construction activities are expected to occur for approximately 60 months, starting in 2018, with an estimated completion date in 2023. Consequently, WSDOT is requesting a 60-month Noise Variance starting from the date that nighttime construction activities start on the site to allow for potential schedule delays.

BACKGROUND

The intent of the Noise Control Code, Chapter 25.08 SMC is to "control the level of noise in a manner that promotes commerce; the use, value, and enjoyment of property; sleep and repose; and the quality of the environment," SMC 25.08.010. The standards for issuing a Noise Variance are in SMC 25.08.590, and the standards for issuing a major public project construction variance are in SMC 25.08.655. SDCI's rules governing the issuance of noise variances are in Directors Rule 3-2009.

The application materials submitted for this Noise Variance identify the following activities that may occur during nighttime hours and may exceed the allowable nighttime construction noise limits:

- Demolishing structures;
- Constructing lid walls (adjacent or over traffic);

- Installing West Approach Bridge South shaft;
- Delivering equipment or material;
- Relocating utilities;
- Making traffic shifts and adjustments to ramps and roadways; and
- Paving operations on City streets.

Limiting Montlake Phase construction to daytime hours only would be unreasonable considering public and worker safety and would render the project economically and functionally unreasonable. Many work activities for this project cannot be completed over or adjacent to active traffic because they are too risky or dangerous to the driving public and workers. It would also require closure of SR520, Montlake Boulevard, and Lake Washington Boulevard during peak traffic periods, which would result in:

- Extensive delays to the traveling public;
- Increased traffic volumes on City streets and nearby highways; and
- A potential increase in the number of accidents in the project work zone.

In the application materials submitted for this Noise Variance, WSDOT identified the closest residential uses likely to be affected by the nighttime noise, presented data on existing sound levels and projected construction sound levels, provided documentation of sound levels for specific activities and equipment, and outlined required noise mitigation proposals to be followed by the contractor.

WSDOT's application includes a Noise Management and Mitigation Plan ("Mitigation Plan") required by SMC 25.08.590.D. The Mitigation Plan includes a description of the type of construction activities and equipment that will generate noise during nighttime hours. It also describes the expected exterior sound levels at each of the receiving sites, and compares these to the nighttime hourly Leq that would be established through the Noise Variance process.

The Mitigation Plan includes prescriptive specifications for noise control at the construction sites that require WSDOT's contractor to implement measures to establish compliance with the nighttime noise limits established in the Noise Variance application. Mitigation measures include prohibiting the use of compression brakes and tonal backup alarms, paving access roads, using radios for all long-range communication, not allowing equipment to idle unused for longer than five minutes, and requiring the contractor to use sand-, rubber-, or plastic-lined truck beds for all haul trucks. Potential additional mitigation measures include using electric welders, critical or double mufflers on equipment such as cranes, and noise blankets for mobile equipment. WSDOT's proposal also includes procedures and programs for effectively monitoring, evaluating, and resolving public complaints by taking appropriate corrective measures. A 24-hour construction hotline shall be maintained by WSDOT. A Nighttime Noise Monitor shall act as an independent third party and provide oversight on nighttime work to represent the public's interest and to determine that the contractor strictly adheres to the Noise Control Code and permit conditions.

SDCI held a public meeting on April 6, 2017, to take public comment on the Noise Variance application. As required by SDCI Director's Rule 3-2009, Section D.2, notice of the April 6 public meeting was published in the Seattle Times on March 9, more than 21 days before the meeting.

Notice of the meeting also was published in SDCI's Land Use Information Bulletin on March 9, 2017. Notice was also mailed to residents within the immediate vicinity of the sound sources covered by the application.

Public comments and letters were received and considered during preparing this Analysis and Decision. Copies of all written public comments received by SDCI are contained in the SDCI file and are posted on the Public Resource Center webpage:

<http://web6.seattle.gov/dpd/edms/> (enter the SDCI Project Number 3027364)

Public comments on the Noise Variance application proposed by the applicant regarding nighttime construction activities were considered in relation to the noise impacts of the proposed activities.

SDCI retained the services of BRC Acoustics and Audiovisual Design ("BRC") to assist in reviewing and analyzing the Noise Variance application. BRC reviewed the Noise Variance application and the revised application and the written public comments, and provided comments and recommendations to SDCI.

FINDINGS

Under DPD Director's Rule 3-2009, Section E, the following standards for a Noise Variance were considered in reviewing the application. SDCI comments follow each code section.

1. Whether the applicant's information and analysis is accurate and complete (i.e., does it contain all of the elements required by the code).

The information submitted by the applicant has been reviewed by SDCI and BRC and has been determined to be accurate and complete.

2. The physical characteristics of the sound proposed to be emitted pursuant to the Noise Variance.

As noted above, WSDOT has developed expected construction activities and a schedule for the Montlake Phase. The analysis contained in the Mitigation Plan demonstrates that means and methods are available to meet the noise limits requested in this Noise Variance. The contractor will propose its own construction activities and schedule, and create a detailed Mitigation Plan to meet the commitments WSDOT has made in its Noise Variance application and the Noise Variance permit conditions issued by SDCI. The design build contractor's construction activities and equipment shall be substantially similar to those identified by WSDOT.

During the fall of 2016, and early months of 2017, WSDOT took measurements of existing ambient sound levels at the following seven sites identified as representative of nighttime noise — sensitive land uses close to each construction area. All sites are in residential zones except site 2, which is in a commercial zone.



- Site 1: 2449 E. Lake Washington Boulevard
- Site 2: City of Seattle Property near Montlake Market
- Site 3: Beaver Lodge Sanctuary
- Site 4: 2740 Montlake Boulevard E.
- Site 5: 2015 E. Roanoke St.
- Site 6: 2800 block E Park Drive East and WABN construction site
- Site 7: 2209 E. Lake Washington Boulevard

The results of these measurements are in the Noise Variance application and summarized in Table 1 below.

Table 1. Average Measured Existing Nighttime Noise Levels – 1-Hour Leq (dBA)

Location	Average Late Nighttime Noise Level (midnight – 5:00 a.m.) Leq
Site 1	61
Site 2	72
Site 3	56
Site 4	60
Site 5	59
Site 6	57
Site 7	60

The nighttime code limit on construction noise in residential receiving districts is an hourly Leq of 45 dBA. Six of the seven sites listed above are in residential districts. Site 2 is in a commercial district with a nighttime hourly Leq code limit of 47 dBA.

Table 2: Ambient levels, Seattle Municipal Code limits, and Requested Nighttime Sound Levels, Hourly Leq

Receiving Residential Property	Ambient Levels	SMC Limits	Requested Limits
Site 1	61	45	67
Site 2	72	47	78
Site 3	56	45	62
Site 4	60	45	66
Site 5	59	45	65
Site 6	57	45	63
Site 7	60	45	66

Sound level compliance monitoring for prior noise variances has revealed challenges with monitoring Leq and Lmax to assess compliance with Noise Variance limits. Leq has been found to be easily influenced by changes in ambient conditions from non-project noise sources. Lmax measures the loudest single event in an hour, which may have nothing to do with construction noise and may represent jet planes, vehicles, non-project sources, an accident, or the dropping of equipment that only lasts for a second or two and is unlikely to be repeated. In a prior Noise Variance decision, SDCI shifted to tracking hourly L01 sound levels to assess compliance under the nighttime Noise Variance limits. L01 measures the sound level that is exceeded one percent of the time, or 36 seconds each hour. After moving to the L01 metric, compliance assessment at job site became more efficient, and the occurrences of potential but unverified site exceedances were greatly reduced. Leq and L01 shall be used to ensure compliance with variance limits for this Noise Variance.

3. The proposed times and proposed duration of the sound to be emitted.

The Noise Variance is requested for the length of time that is needed to complete substantial construction of the Montlake Phase. Nighttime construction activities requiring a Noise Variance are expected to occur intermittently throughout the project duration. Major construction is scheduled to begin in 2018, with an estimated completion date in 2023. The length of the requested Noise Variance is 5 years, which is the anticipated duration necessary to complete the major construction activities. As required by SMC 25.08.665 D, the Noise Variance shall be subject to review by SDCI following one year of operation, with an opportunity for public comment.

4. The topography and population density of the area in which the sound is proposed to be emitted.

This Noise Variance application proposes nighttime construction noise limits for nighttime noise-sensitive receivers in proximity to the Montlake Phase construction area. Nighttime noise-sensitive receivers are generally properties where people are sleeping, such as a residence.

5. Whether the public health and safety is endangered.

It is generally accepted that very high levels of noise have adverse physical impacts on humans including, but not limited to, hearing damage. Many standards apply to occupational exposures at high levels for prolonged periods of time. For example, the Occupational Safety and Health Act mandates a hearing conservation program by employers if sound levels exceed 85 dBA continuously over an 8-hour workday. If sound levels exceed 90 dBA continuously over an 8-hour workday, hearing protection is required. The project sound level limits proposed by this Noise Variance application, as shown in Table 2, would maintain sound levels well below these identified levels.

The requested 6 dBA increase above the measured baseline levels that are sought by WSDOT will likely affect some people, but is not expected to cause a danger to public health or safety.

6. Relative interests of the applicant, other owners or possessors of property likely to be affected by the noise, and the general public.

WSDOT has completed the application process for a Noise Variance because construction crews will work at night within City limits during the Montlake Phase. Nighttime construction work is necessary to avoid disrupting weekday traffic and to provide a safe environment for construction crews and the traveling public. Since nighttime work will be unavoidable, this Noise Variance shall set limits on the noise levels for nighttime construction activities.

While the conditions imposed on this Noise Variance will require additional cost, effort, and flexibility on the part of WSDOT, the conditions are not expected to cause undue hardship. WSDOT appropriately identifies several affected receiving properties. Mitigation described in this analysis, including prohibiting the use of compression brakes and tonal backup alarms, paving access roads, using radios for all long-range communication, not allowing equipment to idle unused for longer than five minutes, and requiring the Contractor to use sand-, rubber-, or plastic-lined truck beds for all haul trucks are expected to substantially reduce impacts to affected properties. The interests of the general public also will be served by the earlier completion of this transportation project and by the shorter overall construction period that nighttime construction will make possible, as a shortened construction schedule will result in cost savings and in reduced construction-related impacts.

7. Whether the proposed noise mitigation approaches are likely to be effective.

WSDOT's "Proposed Noise Mitigation Measures," see pages 31 and 32 of the revised application, include mitigation that shall be implemented during the proposed nighttime construction activities. WSDOT has proposed that the contractor will update the Noise Management and Mitigation Plan

(NMMP) upon award of the contract. WSDOT has proposed review of the NMMP by WSDOT and submittal to SDCI.

WSDOT shall comply with DR 3-2009 by providing an Independent Noise Monitor who is independent from WSDOT control. WSDOT shall also implement and maintain the public outreach and community involvement provisions described in the Mitigation Plan, including a 24-hour construction hotline to be answered by a live person.

BRC concurs that WSDOT's proposed mitigations described in the Noise Variance application will be effective in reducing project sound levels such that impacts to the surrounding residential uses will be substantially reduced.

In addition to the requirements of DR 3-2009 that are discussed above, a Noise Variance applicant must demonstrate that these standards in SMC 25.08.655.A.1 and .2 are met:

A. The Administrator may grant a major public project construction variance to provide relief from the exterior sound level limits established by this chapter during the construction periods of major public projects. A major public project construction variance shall provide relief from the exterior sound level limits during the construction or reconstruction of a major public project only to the extent the applicant demonstrates that compliance with the levels would:

1. Be unreasonable in light of public or worker safety or cause the applicant to violate other applicable regulations, including but not limited to regulations that reduce impacts on transportation infrastructure or natural resources; or
2. Render the project economically or functionally unreasonable due to factors such as the financial cost of compliance or the impact of complying for the duration of the construction or reconstruction of the major public project.

Regarding subsection 1, WSDOT demonstrated that it is not possible to operate the equipment necessary to support nighttime construction activities without violating the nighttime noise limits in SMC 25.08.410 and .420. Nighttime work would allow construction of the State Route 520 project in the safest way practical and minimize surface settlements and potential resulting damage to the built environment and risks to worker safety. Additionally, limiting nighttime work would extend the project duration, increasing traffic, dust, and noise impacts.

Regarding subsection 2, WSDOT has demonstrated that delay in constructing the State 520 Project and associated increased costs will result without nighttime construction.

CONCLUSIONS

1. Findings 1, 3, 4, 5, 6, and 7 above are incorporated as Conclusion 1.
2. Addressing finding 2, WSDOT does not adequately propose measures to ensure compliance with noise levels proposed in the application and included in Finding 2 above. The application section identified as "Compliance Monitoring and Reporting" calls for four monitor locations. The seven locations used to establish baseline sound levels are, however, necessary as measurement and

recording instrument locations for the project's duration. Further, the Application is not clear how an Independent Noise Monitor ("INM") will independently function from the project's production efforts. WSDOT proposed to have a trained staff member as the INM, but no means for how independence would be established.

3. Proper notice was given of the proposed Noise Variance and the required public meeting took place.
4. Requiring WSDOT to comply with the nighttime noise limits in SMC 25.08.410 and .420 would be unreasonable considering the increased risks to both worker safety and public safety that would result from not allowing nighttime construction at State Route 520. The delay and substantial estimated increased cost that would result from compliance with SMC 25.08.410 and .420 would render the construction of the SR 520 Bridge Replacement economically and functionally unreasonable.
5. Practical known and available mitigation measures for reducing the nighttime project sound levels and their effects on nearby residents are described in the Noise Variance application and shall be incorporated into the project. The contractor's construction activities, equipment, and mitigation measures shall be substantially similar to those presented in the Noise Variance application.
6. After reviewing WSDOT's submitted information, the comments made by interested residents and organizations including their statements made at the public meeting and the World Health Organization's report cited in the public comments, and the current body of scientific knowledge, SDCI found no significant or adverse impact to public health and safety if mitigating measures are put in place and followed as provided in this Decision.

DECISION

This Noise Variance is granted for 60 months starting at the beginning of nighttime construction. subject to revocation as provided for in SMC 25.08.615 for the noise related to the nighttime construction activities described in this Analysis, Decision, and WSDOT's March 6, 2017 submittal as revised in the July 6, 2017 submittal.

This Noise Variance is subject to the below conditions and to all requirements, specifications, standards, limits, and mitigation measures identified by WSDOT in its application.

CONDITIONS

1. WSDOT, the primary contractor, and any subcontractors shall follow and execute all noise control measures identified in the application, appendices, and attachments, and this Decision. If there is a conflict between the application's noise mitigation and control requirements or specifications and this Decision, the requirements of this Decision shall control.
2. Nighttime project sound levels shall not exceed the proposed Noise Variance limits specified in Table 2 of this Analysis and Decision. These sound level limits are intended to ensure that

nighttime project sound levels do not exceed the Noise Variance limits at identified receiving sites by more than 6 dBA (Leq). In addition, the nighttime allowable noise limit (L1 based on a slow-response A-weighted level) would be 10 dBA above the one-hour equivalent nighttime noise-level limit (Leq) to account for potential short-term noises. These limits shall apply during the following schedule: weekdays 10:00 p.m. to 7:00 a.m.; and weekends (including legal holidays) 10:00 p.m. to 9:00 a.m.

3. As noted in the July 6, 2017 application, WSDOT shall require the contractor and all subcontractors to use its equipment and trucks in a manner that minimizes the sound that is generated. Specific measures are identified as “Minimum Mitigation Measures” and “Additional Noise-control Measures.” Measures listed under these headings are incorporated into this Decision. All seven monitoring locations used as baseline measurement locations shall be equipped with permanent monitoring devices. Independence of the INM shall be established by WSDOT and approved by SDCI prior to the start of nighttime construction.
4. Public notification and communication shall occur as described in the DR 3-2009 Section F.
5. SDCI shall provide oversight of the nighttime work to ensure that the public interest is protected and that the contractor and subcontractors strictly adhere to the Noise Control Code and the conditions imposed by this Decision. SDCI shall assign a Noise Control Program Specialist who shall serve as the City’s primary contact for noise-related issues at this site. WSDOT representatives with authority to stop work shall be present on the project site during all work hours to ensure that mitigation measures are being followed. Periodic noise monitoring shall occur consistent with Director’s Rule 3-2009. Specifically, monitoring for this project shall occur as described in the July 6, 2017 Noise Variance application.
6. Fourteen days before the start of construction that is subject to this Noise Variance, WSDOT shall provide notice of the start date to the Administrator and to community members who were notified of the original Noise Variance application. The form and content of the notification shall be approved by the Administrator.
7. WSDOT, its contractor, and subcontractors shall be responsible for implementing and adhering to the Mitigation Plan. WSDOT, its contractor, and subcontractors shall be responsible for all equipment used on site whether being used by the contractor or sub-contractor. If noise barriers are used to mitigate sound, the contractor or subcontractor shall be responsible for providing the barriers. Where necessary, due to repeated non-compliance with sound levels established in this variance, substantial sound walls shall be erected to provide effective barriers between the project and adjacent residents.
8. Under SMC 25.08.655.D, the Administrator shall conduct a one-year review and may modify the terms and conditions of the Noise Variance, Decision, or Mitigation Plan if it is determined that the terms or conditions of the Noise Variance, Decision, or Mitigation Plan are not adequately protecting public health and safety or reasonably controlling or mitigating the construction noise, or that more reasonable methods of mitigating the construction noise should be implemented.

10. After the one-year review provided for in SMC 25.08.655.D, subsequent annual evaluations shall be performed of the track record on noise compliance and effectiveness of construction noise mitigating conditions in place. If necessary, new or modified conditions may be imposed to improve compliance results.
11. Violation of any condition of this Noise Variance or Decision shall result in a review of the conditions imposed by this Noise Variance and Decision, and may result in: modifying the conditions; or revoking this Noise Variance as allowed by SMC 25.08.615.

Dated the 21st day of August, 2017

Nathan Torgelson
Director, City of Seattle Department of Construction and Inspections
Administrator, Chapter 25.08 SMC

APPEAL

The Noise Control Code, Chapter 25.08 SMC, provides that any person aggrieved by the denial, approval, or the terms and conditions imposed on a Noise Variance or by the extension of a Noise Variance by the Administrator, may appeal such decision to the City of Seattle. Hearing Examiner pursuant to the provisions of the Seattle Municipal Code Section 25.08.610. Appeals of this decision must be received by the Hearing Examiner no later than ten days following the date of the decision and be accompanied by a check for \$85 made payable to the City of Seattle.