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9 December 2024

Lauren Swift - Ballard Link Extension
Sound Transit Board Members
Goran Sparrman, Sound Transit CEO
401 S. Jackson St.,
Seattle, WA 98104

RE: Scoping for Ballard Light Rail Extension DEIS and CID station location

Dear M. Swift and Sound Transit Board Members,

In 2023, community leaders and organizations from Seattle's Chinatown International District (CID) came together to oppose a Ballard Link Extension station (BLE) in the heart of their neighborhood. This included the Fifth Ave Deep, Fifth Ave Shallow, and Fifth Avenue Diagonal alternatives. As a result, the Sound Transit Board (through Motion No. M2023-18) designated a new option – two stations just north and south of the CID – as the preferred alternative. The Board also requested additional investigation of a new Fourth Ave "shallower" station in response to concerns raised by some that the North and South stations were not co-located with the existing CID transit hub.

We were subsequently very surprised to see the Fifth Avenue diagonal included in a recent report to the Sound Transit Board, as if that alternative was now being considered along with the other two. For the purpose of this letter, and the BLS DEIS scoping in general, it is unclear what alternatives are now being studied in the upcoming EIS. No outreach or advanced notice to the CID community was given. This failure on the part of Sound Transit is consistent with the inadequate community engagement in the lead up to the larger WSBLE DEIS in 2022 and 2023.

Furthermore, based on M2023-18 and the Board's discussion of alternatives at the time, Fourth Avenue shallower no longer meets their criteria for station location and should not be further considered. Sound Transit's purpose in M2023-18 was to study how the high cost and disruption to the CID community could be reduced for the Fourth Ave Shallower alternative. In *Additional Study Results: Construction Approach and Duration for CID Alternatives*, Sound Transit staff and experts determined that reduction of both cost and harm is not possible with a Fourth Avenue option and therefore would not be considered further.

For the following comments on BLE scoping, we will assume that all three alternatives (Fourth Ave Shallower, Fifth Ave diagonal, and the South station) are being seriously considered. We also expect the following from the NEPA DEIS analysis:

- The three station options mentioned in the *Additional Study Results* will be compared so the public and Sound Transit Board can clearly identify the costs and benefit tradeoffs of these station alternatives to the CID community and neighborhood.
- Additional and deeper study of the impacts for both construction and operational periods.
- Deeper analysis of environmental justice impacts to the CID neighborhood, especially cumulative impacts.

Concentration of Impacts in the CID

The CID is a highly concentrated, highly integrated and dense neighborhood. For its size, the neighborhood provides more social cohesion and cultural access than any other in Seattle. Although small, the neighborhood provides larger than expected social and economic benefit to members, visitors, and the region. For this reason, impact analyses to the neighborhood must be fine-tuned and specific. As was revealed by strong community opposition to station sites in the middle of the CID, construction impacts are especially important to the community.

To that end, we believe the 2023 DEIS provided an inadequate level of detail and specifics to understand construction impacts. Given the high amount of commercial, industrial, tourist, customer, resident, and unhoused people's use of streets in a concentrated neighborhood, Sound Transit must gain a better understanding of local dynamics - a small change in one part of the neighborhood could greatly affect another. For example, a statement in the WSBLE DEIS that a six-year (or more) construction period will be merely an inconvenience misses the interdependence of both stakeholders and the CID's sub areas. For example, under a Fifth Ave Diagonal station, closure of King Street and presence of large-scale construction across the street from the CID's most important park will have major ripple effect not captured in the prior DEIS.

As another example, the WSBLE EIS stated that "Hing Hay Park would experience proximity impacts due to construction staging across the street on the west side of 6th Avenue South. Impacts would include a temporary increase in construction traffic, dust, noise, and would also be visible to park users." This is not an analysis of levels of particulate matter caused by construction nor levels of construction noise, but a vague statement that anyone could come up with – it also lacks a cumulative analysis. We expect Sound Transit to provide measurements and more detailed comparisons when it comes to historically impacted communities.

Transportation Impacts

<u>Current Travel Modes</u>
The BLE EIS must study the current modes of travel for the CID's myriad users.

During the debate on a CID station location, many people outside of the neighborhood complained that a South station would make the new light rail line too inaccessible. Several residents said that they would not be able to travel to a South station from their apartment. However, no analysis was provided by Sound Transit on who uses light rail now and who will use it in the future. A Sage-conducted survey of 70 CID residents and workers – most of whom were older than 60 – showed that few people rely on

light rail to travel. By far the highest modes were walking and Metro bus. This mode split is likely a reflection of both the frequent destinations of residents as well as cultural familiarity with bus travel.

Furthermore, the high ridership figures for a future CID station, by Sound Transit's own estimates, does not reflect people coming to the CID or Pioneer Square neighborhoods, but transferring within the light rail system or to other travel modes. Sound Transit should provide clarity on whether or not the CID will benefit from the high ridership or simply be a transfer point. We need a comparison of the station options and their benefit to the community, based on a projection of actual visitors disembarking in the CID. This will illuminate the tradeoff between impacts to the CID versus benefits for the rest of the region – a tradeoff the CID and its BIPOC community have been forced to endure for decades.

Pedestrian Impacts

Sound Transit must provide an analysis of pedestrian activity in the CID. During construction, the 5th Ave Diagonal and the 4th Ave Shallower locations will be very disruptive to key pedestrian corridors and access to the CID. In the WSBLE DEIS, Sound Transit claims that rerouting pedestrian traffic around construction hazards will create an "inconvenience" for people using the sidewalks. The problem with this conclusion is that the CID is already hazardous for pedestrians, despite its high walkability. Streetcar rails, deteriorated sidewalks, cars short-cutting through the neighborhood, massive car influx during sports events, delivery drivers to the dozens of restaurants, and delivery trucks to the many businesses create a maze of hazards that pedestrians must navigate. We need to know which of the station locations will exacerbate this cumulative impact the most and least. Sound Transit can collect data on pedestrian traffic volume on different streets and roads (just like is done for intersections) especially for those being closed or partially closed.

On the flip side, the community needs to know how many large trucks and construction vehicles will be on the streets during the different phases. For example, the 5th Ave and South stations will require an enormous removal of soil – how many dump trucks will be driving through the neighborhood and on what streets? Again, the CID is not a typical neighborhood. We have a disproportionate number of elderly, unhoused, low-income and BIPOC residents that have different travel patterns and needs than in other Seattle neighborhoods. The community does not want to experience death or injury from the conflict between construction vehicles and local mobility.

Gateway to CID

The Chinatown gate monument that welcomes visitors to the neighborhood is more than symbolic – most people exiting the Union Station transit hub walk east on King Street to the center of the historic part of the CID. Closing off King Street for a Fifth Ave Diagonal station for a proposed 3 years (minimum) could be harmful to far more businesses than just the ones being displaced by building demolition. The BLE DEIS's analysis of pedestrian activity assumes walkers will just go around (although Weller may be closed as well) the block. However, fewer people may visit the CID as a result, having an undirect impact on other businesses, social service providers, and cultural attractions.

Cumulative Impacts

The BLE DEIS mentions the impact of multiple development projects occurring at the same time as a source of disruption and displacement. But the DEIS lacks the details needed to compare station locations.

For example, several large buildings have recently been developed or are being developed now in the CID. Given the tight quarters and scale, project construction is slow and requires long lasting sidewalk closures. The BLE DEIS should include potential development projects through the end of construction to determine cumulative impacts.

More specifically, the Fifth Ave Diagonal and South Station locations offer significant TOD potential. Construction of new, affordable and community-oriented projects will be key to the success of the new station. However, this will add to cumulative impacts – even though construction may end after 6-7 years, how many more years of building construction also close sidewalks and create hazards? Given how long in-fill development takes, the station area could experience 10-15 years of construction.

Bus Cuts

After the opening of the Link Light Rail Line to SeaTac Airport, King County Metro cut several bus lines and reduced frequency of others, concluding that they are redundant with the new light rail line. However, the light rail stops every mile or so, while the cut buses (such as the 42) stop every few blocks, serving children, elderly people, and other mobility-limited users. Instead of an enhancement, the riders on these buses experienced a loss in service, either experiencing longer trips or shifting to a different mode altogether.

The DEIS needs to show whether transit dependent CID residents will lose more local service than gained from a light rail station. Will Metro cut buses from West Seattle? Or buses coming from South Seattle to circulate downtown? Community members need to understand these implications before being able to weigh in on alignment and station locations.

Congestion

An analysis of intersection Level of Service should be done for the South Station alternative for comparison with the other two, which were included in the WSBLE DEIS.

Environmental Impacts

Noise and Vibration

The CID experiences a disproportionate level of noise and vibration, compared to many other residential neighborhoods in Seattle. Many residents and people on the street are already impacted by I-5, the Streetcar, heavy traffic on arterials (Jackson St, Dearborn St, and 12th Ave), as well as congested streets within the neighborhoods. Continuous building construction adds yet more noise. Moreover, a large portion of affordable housing in the neighborhood lacks air conditioning, and closing their windows in the summer is not a safe option.

The WSBLE states that “Distribution of [noise] impacts to minority and low-income populations would be similar to the distribution to the general public” (page 5-55) and that “No monitoring was done in the SODO, Chinatown-International District, or Downtown segments because the project would be in a tunnel or in areas without noise-sensitive receivers” (4.3.7-4). The DEIS further states that dBA could be as high as 89 at 50 feet for cut and cover construction, which could be painful for a large number of people around a construction site. Because of this, we believe Sound Transit has not adequately assessed the noise impacts during construction.

Sound Transit should measure current noise volumes in the areas near the proposed station location alternatives, so an adequate cumulative impact can be calculated. Sound Transit should also consider Hay Hing Park as a sensitive receiver – cultural events and outdoor concerts occur there all the time.

Air Quality

The CID has some of the poorest air quality in the city. Airborne particulate matter from I-5, the Port of Seattle's maritime operations, commercial truck traffic and some fossil fuel powered buses blanket the community with pollution. The community also experiences disproportionate respiratory illness. While a new transit line will reduce pollution for the region, the question for Sound Transit is whether the construction of the new station will create a harmful cumulative impact, especially on residents and workers who live nearby the proposed station alternatives.

As with noise impacts, Sound Transit has not measured actual particulate matter levels are in the neighborhood. Furthermore, the WSBLE DEIS states that "According to Code of Federal Regulations Title 40, Section 93.123(c)(5), because the duration of major construction activities for the project would not exceed 5 years in any one location, construction emissions are considered a temporary impact and a project-level conformity analysis is not required" (page 4.3.6-7). As we state above, construction involving large vehicles and equipment may last six years or more on the station alternatives, and even longer with construction of TOD near the stations. Sound Transit should provide air quality data on both diesel and dust particulates already present and projected during construction for each station area.

Business Displacement

Small businesses are the life blood of the CID's local economy. Several factors allow restaurants and shops to succeed – older buildings that are more affordable, proximity to multiple high-capacity transit lines, many local and regional visitors of Asian heritage to specialty shops, proximity to sports facilities, and cultural assets that attract tourists and visitors. But small businesses in the CID are also fragile, consisting of many small mom-and-pop that operate at thin margins and are very sensitive to changes in the above factors. Sound Transit further states, "These displacements include businesses that are important to the community because of the history, strong cohesion, and long-standing community connections in the neighborhood."

While the WSBLE DEIS identifies exactly which buildings will be torn down and the number of businesses displaced for station location alternatives, it fails to consider the broader impact of station construction on the rest of the CID. For example, closure of King Street and Weller Street could create enough diversion away from the area around Hing Hay park that other businesses east of 6th Ave will suffer as well. The potentially displaced businesses on 5th and King Street, under the 5th Ave Diagonal option, may not be able to succeed in any other location, relying heavily on being across the street from Union station.

Sound Transit should study the number of commercial spaces available for small businesses, the importance of proximity to foot traffic, and whether or not displaced businesses could successfully relocate. In addition, subsequent construction of mixed-use buildings should not be considered replacement space, as rents for new construction are far higher than in older buildings. As the CID could suffer a permanent loss of key affordable business space with the demolition considered for 5th Ave Diagonal, Sound Transit should also compare the locations to determine the least harm.

Historic Preservation

The WSBLE DEIS states that no station options in the CID can avoid demolition of a potentially historic building. However, the CID South station was not considered. Because the Federal Transit Administration requires a determination of least harm, and the South station does not result in demolition of a historic building, the new DEIS must compare all three alternatives.

Transit Oriented Development

We believe that equitable TOD that creates affordable housing, affordable commercial space, cultural spaces, new recreation space, and cultural preservation is the most important, long-lasting benefit of a new station. It will be an opportunity to grow the neighborhood in ways that include, not displace, existing community members.

To that end, Sound Transit should study the actual TOD potential in detail, not in the vague way described in the WSBLE DEIS. To compare station location alternatives, we should know:

- Total area of land available for TOD after station construction.
- Total number of affordable units that could be built, with a baseline of Sound Transit's TOD policy, but also beyond.
- Specific opportunities for joint development with CID-based developers.
- Potential for a new park or recreational open space, which the neighborhood currently lacks.

Closing Notes

The CID has always been a welcoming space for strangers and working-class people, as well as a hub of commercial activity for Seattle. Public transit has been key to the longevity of the community and is today used widely by the CID's BIPOC residents and workers. Despite perennial construction in and around the CID, public transit is one of the clear benefits to the community, in contrast with I-5. However, the proposed WSBLE system may only marginally improve transit access to CID stakeholders. We don't want to see, once again, an infrastructure that is a benefit to the region (and State) but causes disproportional harm to the CID – with little upside. We believe that if Sound Transit can study and answer the questions we pose in this letter, everyone will be better informed about these tradeoffs, and which station location ensures maximum benefit to our special community. Please reach out to us with any questions you have about our comment letter at howard@pugetsoundsage or jm@pugetsoundsage. Thank you for your time and attention.

Sincerely,

JM Wong, Organizing Director
Howard Greenwich, Research Director

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December 9, 2024

VIA E-MAIL

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Seattle, WA 98104
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Re: Scoping of Ballard Link Extension DEIS ("BLE DEIS")

Dear Ms. Swift:

We represent the Seattle Center Foundation and the following resident organizations at Seattle Center: KEXP, Seattle Repertory Theatre, The Vera Project, Cornish College of the Arts, Classical KING FM 98.1, MoPOP, Seattle Children's Theater, PNW Ballet, and Seattle Opera (collectively the "Clients"). We commented previously on behalf of the Clients regarding the West Seattle Ballard Link Extension Draft Environmental Impact Statement ("WSBLE DEIS"). A copy of that letter is attached as Attachment A for background and context for the comments this letter contains regarding the scoping of the BLE DEIS. Our Clients are ardent supporters of the Ballard Link Extension ("BLE") as this transit facility will ultimately make it easier for people throughout the region to visit Seattle Center and partake of the offerings this cultural mecca provides. However, the construction of the BLE will create many impacts that must be analyzed both individually and cumulatively. Building six light rail stations and two tunnels simultaneously will create many related and interlinked impacts with potentially huge unintended consequences for the Clients.

TRANSPORTATION

This element of the environment is perhaps the most complicated one to assess the extent of the impacts due to the unpredictability of the decisions motorists will make as they confront closed streets and intersections. Sound Transit must do more analysis of the transportation impacts than it did in the WSBLE DEIS. Construction laydown sites must be identified and construction traffic routes must be identified to assess the transportation impacts. Sound Transit seems fairly committed to using design build contracts for the light rail stations which means postponing important means and methods decisions until contractors are hired. However, the potential magnitude of the impacts of the BLE necessitate earlier decisions regarding construction lay-down sites, construction routes, and closures of roads and intersections. Meaningful analysis of the construction impacts cannot otherwise occur. Additionally, there must be cumulative analysis that accounts for disrupted traffic taking routes that might not normally be considered due to the simultaneous construction of other light rail stations. For the Seattle Center and its resident organizations, the analysis needs to include impacts for both event times and nonevent times.

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Parking is another critical issue for the Clients. Even with no closed streets or intersections, parking is a scarce resource when there are large or multiple events happening at Seattle Center. Construction of the Seattle Center Station will result in loss of street parking for periods of time and existing surface parking lots may be lost to lay-down and construction staging areas. The loss of parking that occurs due to the construction activities for the Seattle Center Station and potential mitigation options should be analyzed. Construction worker parking should also be considered and mitigation such as bussing the workers to the construction site(s) should be considered.

One aspect of the Seattle Center Station that will create very large transportation impacts is the very large trench that will be dug in the Republican Street right-of-way from the station to the north tunnel portal. This will close a number of intersections and severely complicate north-south travel in the Uptown/Seattle Center neighborhood. Mitigation for these impacts, such as bridging the trench with steel plates, must be incorporated into the construction plans, and the bridging must occur at all the impacted intersections.

Another transportation impact that the Uptown/Seattle Center neighborhood will incur is the export of most of the dirt from excavating the tunnel. This will necessitate hundreds of dump truck loads going from the Seattle Center Station location to I-5 or other highways. The haul route(s) for these trips must be analyzed and the timing of the trips must be managed to avoid significant adverse transportation impacts.

The BLE DEIS must also account for the concurrent development of significant transportation infrastructure contemplated by Proposition 1 which the voters of Seattle approved in November. The Revive I-5 project proposed by the Washington Department of Transportation may also present concurrent transportation impacts depending on the timing of Sound Transit's construction work. These concurrent projects and their cumulative impacts must be analyzed and mitigated.

NOISE AND VIBRATION

The Clients appreciate and thank the Sound Transit Board for moving the preferred location of the Seattle Center Station further west on Republican Street. That decision eliminated many potential construction impacts to Seattle Center and its resident organizations. However, the route from the South Lake Union Station to the new Seattle Center Station location further west on Republican Street will still traverse beneath the Seattle Center Campus. Our Clients all have buildings and performances that will be subject to potential noise and vibration impacts both during and after construction. Those potential impacts are serious and must be analyzed. Some of those impacts may be unavoidable, but they must be analyzed and mitigation measures must be evaluated. Potential mitigation measures include scheduling construction activities to avoid times when performances are occurring; utilizing vibration absorbing mats beneath the tracks; and using vehicles with rubber wheels for construction and to move materials and equipment into and out of the tunnels.

UTILITIES

The BLE will require extensive relocation of utilities. The BLE DEIS must analyze the timing of those relocations and the potential cumulative effects of those relocations. There are not only utility service concerns but also transportation impacts that will result from this work. Roads, bike lanes, and sidewalks will all be impacted by the relocation work. Impacts and mitigations must be analyzed.

ECONOMIC IMPACTS

Although the State Environmental Policy Act regulations so not require rigorous economic analysis, where the proposed action may result in blight, economic impact analysis must occur during environmental review. The pandemic demonstrated that blight can occur even in a vibrant city such as Seattle. Rows of closed shops and stores appeared in Downtown Seattle during the pandemic as a result of the owners having to close because they had no customers. Seattle has still not recovered from that blight. The same thing can happen in the Uptown/Seattle Center neighborhood if closed streets and intersections make it difficult or impossible for pedestrians and motorists to access stores and shops. The owners of those businesses may have no choice but to close, especially given the seven to ten year period of construction.

SUMMARY

The BLE will be perhaps the most disruptive construction project for the City of Seattle since I-5 was constructed through the City in the sixties. With the Proposition 1 projects being constructed concurrently, it is imperative that Sound Transit, and the City, plan carefully in a coordinated manner to minimize the impacts of these projects. Lack of analysis of the specific and cumulative impacts will likely create unintended consequences that become existential threats for the cultural organizations at Seattle Center as well as the many small businesses in the Uptown/Seattle Center neighborhood. Thank you for your consideration of our suggestions for the scope of the BLE DEIS.

Sincerely,

Donald E. Marcy

cc: Jane Zalutsky, Executive Director Seattle Center Foundation
Brenda Barnes, CEO Classical KING FM 98.1
Pinky Estell, Director of Operations Cornish College of the Arts
Jeffrey Herrmann, Managing Director Seattle Repertory Theater
Kevin Malgesini, Managing Director Seattle Children's Theater
Ethan Raup, CEO KEXP
James Robinson, General Director Seattle Opera
Ellen Walker, Executive Director Pacific Northwest Ballet
Jason Clackley, Artistic Director The Vera Project
Michele Smith, CEO MoPOP
Tom Mara, Executive Director Seattle International Film Festival
Marshall Foster, Seattle Center Director

Attachment A

SCF-Resident Orgs DEIS Comment Letter
April 27, 2022

ATTACHMENT A

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April 27, 2022

WSBLE Draft Environmental Impact Statement Comments
c/o Lauren Swift
Sound Transit
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Re: West Seattle Ballard Link Extension Draft Environmental Impact Statement ("DEIS")

Dear Ms. Swift:

We represent the Seattle Center Foundation and the following resident organizations at Seattle Center: KEXP, Seattle Repertory Theatre, The Vera Project, Cornish College of the Arts, Classical KING FM 98.1, MoPOP, Seattle Children's Theater, PNW Ballet, and Seattle Opera (collectively the "Clients"). Our concerns and comments are focused on the Downtown Segment and the Seattle Center Station in particular. The preferred alternative creates many significant adverse environmental impacts to our Clients, particularly KEXP and The Vera Project which, along with the Seattle International Film Festival, are located in the Northwest Rooms ("NW Rooms" and KEXP, The Vera Project, and Seattle International film Festival ("SIFF") are referred to collectively the "NWR Occupants") and the Seattle Repertory Theatre ("Seattle Rep") and Cornish College of the Arts ("Cornish") which are also adjacent to the proposed Seattle Center Station for the Preferred alternative. All of the Clients are tenants of the City of Seattle ("City").

We and the Clients have reviewed the DEIS which was issued recently by Sound Transit as lead agency under the State Environmental Policy Act ("SEPA") and the United States Department of Transportation Federal Transit Administration as lead agency under the National Environmental Policy Act ("NEPA"). Although the DEIS recognizes there will be some significant impacts to the Clients, the document does not recognize all of the significant impacts nor does it capture accurately the full effect the Seattle Center Station in the preferred location (the "Project") will have on the Clients. It appears that the construction impacts will be so severe that the NWR Occupants, Seattle Rep, and Cornish will be unable to operate in the ordinary course of business for a significant period of time. While we recognize and appreciate that Sound Transit has been working with the Clients on refinements to the Seattle Center Station, we do not address those refinements in this letter as they are not in the DEIS and have not been evaluated other than to establish that they might be feasible for Sound Transit to construct.

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Initially, it may be helpful to provide you with some context regarding the Clients and their operations in the at Seattle Center:

KEXP

Besides its radio broadcasts, KEXP hosts live music and related events on site each year. 2017 was the last complete year of programming before embarking on arena mitigation construction work in late 2018. That year, there were 377 such events including 136 live music sessions that were free and open to the public. Among the many other music related events open to the public were the KEXP Record Fair, the Songbook author reading series, Mastering the Hustle workshops for artists, City of Music Career Day, monthly "Flights and Rights" partnership with ACLU, as well as civic related events such as a Mayoral Forum on Arts and the Environment, a naturalization ceremony in partnership with ARTvocacy, an ArtsFund event "Setting the Table for More Diverse Nonprofit Boards," and more. These live sessions and events are the engine that drives many critical aspects of KEXP's mission and business, including donations and business support. Virtually all live performances are recorded for future use by KEXP, including on YouTube, which serves KEXP's largest audience with 2.7 million subscribers and over 1 billion views. The performances are also broadcast on KEXP's 24-hour FM signal, broadcast stream and 14-day archive, all of which are available to the public at no cost. The in-person traffic created by the live sessions and events not only builds momentum for KEXP, but also sustains the Caffe Vita coffee shop and Light in the Attic Record Shop, KEXP's subtenants located in the Gathering Space. If KEXP is required, on account of the Project impacts, to move or curtail these public events, then all three entities will suffer.

Seattle Children's Theater

Seattle Children's Theatre (SCT) offers theatre programs that center on children and youth, with great attention to the people in their lives – their families, their teachers, and their communities. Since 1975, SCT has produced 274 plays, including 117 world premiere productions, with many of these works going on to other stages. In 2019-20, Theatre for Young Audiences/USA ranked SCT #1 in the country as an influencer in developing TYA titles. SCT has served nearly six million people through our Mainstage, Drama School, and school access programs. These programs create a dynamic entry point to the arts for many children in the region, inspiring their imaginations, empowering their creativity, and instilling an appreciation for a diversity of stories and people. Providing access for ALL young people is of primary importance to SCT. We strive to be inclusive, diverse, and equitable, and to remove any and all barriers to children's access. A school field trip to SCT is often the very first live arts experience for many of our young people. We hold proud the role we play in opening a world of imagination and possibility to the youth of our region.

Seattle Opera

Since 1963, Seattle Opera is committed to serving the people of the Pacific Northwest through music, storytelling, and programs for people of all ages, income levels and demographics. Annually, more than 80,000 attend the company's performances and another 150,000 are served through school performances, radio broadcasts, and more. We bring opera to life in many ways, offering artistic

excellence through national and international collaborations. Seattle Opera strives to create an environment where artists, staff, behind-the-scenes workers, and members of the community feel a strong connection to the company and to the art of opera. Seattle Opera constructed and in December 2018 opened the $62M Opera Center headquarters adjacent to the McCall Hall performance venue. The 105,000 square foot building hosts the administrative offices, rehearsal halls, stage crew workshops, hair/make-up/wardrobe work areas, community program spaces, and a glass-box performance area. The building also hosts the Classical 98.1 KING-FM radio station headquarters. Pre-pandemic, Seattle Opera had an operating budget of $25M and annually issued 700 Form W2s to full and part-time employees, the majority of whom are represented by six collective bargaining units. Currently, Seattle Opera has 7,000 subscribers, approximately two-thirds of which are over the age of 50, and 90% of whom request parking with their annual subscriptions.

Classical KING FM 98.1

Classical KING FM 98.1 is the primary institution developing new audiences for classical music and the arts in Seattle, Bellevue, and the Puget Sound Region. In addition to creating programming that offers everyone in the region an opportunity to make classical music and the arts a part of daily life, Classical KING FM partners with arts and culture organizations of all size and scope in the region. We offer broadcast performances of local concerts as well as an opportunity for local musicians to perform on our signature Friday evening program *Northwest Focus LIVE.* Teachers and parents use Classical KING FM to introduce children to classical music, and the station has additional programs to supplement this important work. Through our popular Instrument Petting Zoos, the annual Young Artist Awards competition, and other partnerships, KING FM provides support for arts education in the region. More than 15,000 members are supporters of Classical KING FM, helping to pave the way for a bright future for the station, and bringing the richness of classical music to diverse audiences in the rapidly growing Puget Sound Region.

SIFF

For 48 years, SIFF has been creating experiences that bring people together to discover extraordinary films from around the world. In 2011, SIFF Film Center moved its main offices and classroom to Seattle Center and built a 90-seat jewel box, state-of-the-art movie theater. The Film Center at Seattle Center is one of the few independent art-house cinemas remaining in Seattle where communities can watch independent films together on the big screen, and get a direct connection to the movie's director, screenwriter, and actors. SIFF supports underrepresented communities such as showcasing Indigenous films by and about Native Americans giving a voice to storytelling from around the world through the universal themes of the environment, social justice, and the human experience. There is no other film organization in the Pacific Northwest with the depth and breadth of SIFF. SIFF also owns and operates the three-screen SIFF Uptown Cinema located just off of the Seattle Center grounds at the corner of Republican and Queen Anne Avenue.

Every year at SIFF (pre-Covid)

- Seattle International Film Festival showed (2019) over 400 films, from over 80 countries, and with over 45% women filmmakers
- Engaged over 8500 students in free education programs with filmmakers
- Distributed over 17,000 free tickets to underserved communities

Cornish College of the Arts

Founded in 1914, Cornish College of the Arts is a nationally recognized leader in the study of visual and performing arts offering undergraduate degrees in Art, Dance, Design, Film, Interior Architecture, Music, Performance Production, and Theater. The Cornish Playhouse serves as the nerve center for a wide range of internal curricular and external community base activities related to the college's mission. These facilities house classroom, office, studio, rehearsal, public meeting/conference room, gallery, and scene shop spaces. The Cornish Playhouse is used not only by the college but shared with other non-profit organizations and the general public as well. Each year 35-40 local non-profit organizations rely on the Playhouse to produce their events and shows. These are often companies that do not own their own space and, in some cases, have already been recently displaced due to other development in the city. Without the Playhouse companies like Whim W'Him Dance Company, Seattle Musical Theater, Show Tunes, and Theater Anonymous, just to note a few, who would have a nearly impossible task of finding equivalent space to produce. Even today with the venues in full operation, we have to turn down dozens of productions due to the limited space and time available. In addition to the shows, we provide space for groups to gather for meetings, tests, fundraisers, exhibitions and many more activities that support the creative economy. In the average year we see over 13,000 people engage at these facilities, not including Folklife and Bumbershoot which average an additional 10,000 audience members during their time in the Playhouse facilities. If construction activities unfold as currently proposed, Cornish is deeply concerned with its ability to continue carrying out any or all of the activities as previously described and the harm such an outcome may cause. The College currently enrolls 500 undergraduates and annually serves more than 300 youth and adult learners through extension programming. 88% of the College's undergraduates are from the State of Washington, and the majority of Cornish's alumni remain in the Puget Sound region after graduation, fueling the region's creative economy.

The Vera Project

The Vera Project is an all-ages nonprofit space dedicated to fostering personal and community transformation through collaborative, youth-driven engagement in music and art. A music venue, screen print shop, recording studio, art gallery, educational institution, and safe space for radical self-expression, VERA is a home to Seattle's creative community. As of 2022, we annually offer access and opportunity in the arts to over 35,000 young people, place youth audio engineers and production workers at every major venue and festival in King County, disburse tens of thousands of dollars in scholarships, train the next generation of youth community leaders, and feature more young, BIPOC artists on our stages than anywhere else in town.

Seattle Rep

Founded in 1963 by local citizens as an investment in a thriving city, Seattle Repertory Theatre was the very first performing arts institution to be located at Seattle Center. Nearly 60 years later, Seattle Rep anchors the NW corner of the campus in a two-theater facility that it has occupied continuously since 1983. Seattle Rep's mission is to collaborate with extraordinary artists to create productions and programs that reflect and elevate the diverse cultures, perspectives, and life experiences of the Pacific Northwest. Guided by the values of artistic vitality, sustainability, and generous and inclusive practices, Seattle Rep's vision is a world where theater sits at the heart of public life, positioning the work on its stages as a vital source for collective imagination, meaningful conversation, and healthy social debate. Seattle Rep reaches 150,000 audience members annually (pre-COVID) through its mainstage season, new play activities, arts engagement work, and Public Works programming. Each production is built onsite at Seattle Rep by an internal production team of skilled artisans and craftspeople that also supports other production needs throughout the city. Seattle Rep's resources and reputation attract theater professionals from across the country and world who are working at the top of their craft, earning Seattle Rep the 1990 Tony Award for Outstanding Regional Theater (awarded once in a theater's lifetime), and positioning Seattle Rep as a home for local artists and a national incubator and destination for great art. Over the course each season, Seattle Rep employs more than 400 individuals, including upwards of 50 carpenters, seamstresses, and painters.

PNW Ballet

Founded in 1972, Pacific Northwest Ballet (PNB) is one of the largest arts employers in the Puget Sound region and one of the top professional ballet training institutions in the country. PNB serves over 200,000 community members each year through mainstage performances, PNB School classes and productions, partnerships with Bellevue and Seattle Public Schools, dance education, community education programming, and tours. PNB is a key contributor to the artistic, economic, social, and cultural vibrancy of Puget Sound and beyond, driven by our guiding principle to inspire, engage, and educate through dance. While PNB distinguishes itself in the depth and breadth of its educational efforts, reinforcing its role as a community asset, the entire organization aspires to reflect and engage citizens in our region's diverse communities and ensure that all paths in to PNB are welcoming and inclusive.

MoPOP

Since opening in 2000, the Museum of Pop Culture has used the universal appeal of our content — be it anything from music, film, and television, to games, sports, and tattoos — to build connections and spark creativity. Having produced more than 100 exhibitions, reached more than 1 million young people through our educational programming, and stewarded more than 100,000 artifacts in our collection, we harness pop culture as a way to make creative expression a life changing force for our visitors. As a nonprofit institution in Seattle, we proudly showcase the Pacific Northwest's pop culture history and empower young people in our community — especially those with limited access to creative opportunities — to see themselves as tomorrow's visionaries and risk-takers. We are also an international destination as a gateway to American cultural heritage having reached more than 11

million people across six continents. But no matter where you're from, MoPOP offers experiences that inspire and connect.

Our comments on the DEIS are as follows:

A. Chapter 2 ALTERNATIVES CONSIDERED

2.1.2.2.3 Downtown Segment

SEPA and NEPA do not require that all reasonable alternatives be studied, but a reasonable number and range must be studied. WAC 197-11-440(5)(b)(i), (c)(vi). The DEIS provides only two alternatives for the Seattle Center Station and they are only a block apart. This is an inadequate number of alternatives given that both Seattle Center Station alternatives have significant impacts. At least one or two more alternatives including an alternative that serves Seattle center from its south side, should be included in the DEIS.

B. 2.5.1 Development of DEIS Alternatives

p. 2-79 Evaluation Criteria used for evaluating alternatives do not include consideration of sensitive receivers which should be a criterion given the large number of sensitive receptors on the north side of Seattle Center.

comment: Another important failure of the DEIS is to provide adequate information regarding Alternative DT-2. There is inadequate discussion and analysis of the impacts of this alternative, particularly regarding access impacts from street closures and noise and vibration impacts.

C. 2.6.2 Typical Construction Activities

p. 2-85 The DEIS notes that dewatering could be needed throughout the project corridor. However, there is no analysis of what impacts this might have on structures in the vicinity of the dewatering.

comment: The NW Rooms experienced cracked floors on account of the dewatering that occurred in conjunction with the Arena Renovation in 2019. Further analysis of dewatering impacts to the NW Rooms, Seattle Rep, and Cornish should be conducted.

D. Chapter 3 TRANSPORTATION

3.19.4.1 Arterial and Local Street Operations

Table 3-30 summarizes the major construction closures for the Downtown Segment. There are significant closures noted for the Seattle Center Station construction:

1. Republican Street Queen Anne Avenue North to Warren Avenue North: Full closure, 5 years (includes 15- month full closure of intersection at 1st Avenue North);

2. Mercer Street/West Mercer Street Warren Avenue North to 1st Avenue West: Partial closure, 3.5 years; and

3. Harrison Street for construction of the South Lake Union Station.

comment: These are significant impacts to the NWR Occupants, Seattle Rep, Cornish, and the organizations on the east side of the Seattle Center campus. Republican Street is a critical access point for the NW Rooms. Republican Street is used extensively by KEXP and The Vera Project for unloading and loading of equipment used by musicians who perform in their spaces. Collectively, these two organizations have approximately 600 such performances per year. Loss of this road for five years will have a significant adverse impact on their ability to fulfill important parts of their missions. Similarly, construction of the South Lake Union Station will have significant adverse impacts to the Clients on the east side of Seattle Center.

There will also be closures of August Wilson Way and portions of 2nd Avenue N. for five years or more as these streets will be used for construction and construction staging. These closures have a very significant adverse impact to Seattle Rep and Cornish as they use these streets for access and ADA parking.

Portions of 1st Avenue N. both north and south of Republican Street will also be closed for construction staging which will further exacerbate impacts to access and loading operations for the NWR Occupants. Republican and 1st Avenue N. is also where dedicated school bus parking is located so this closure will limit access to Seattle Center for groups of school children. The parenthetical reference to the closure of Seattle Republican and 1st Avenue N. intersection does not reflect the significant disruption to traffic and transit service needing to cross the construction zone.

The cumulative effect of these closures has not been adequately addressed, and the mitigation suggested for these impacts is totally insufficient. Sound Transit has not analyzed sufficiently temporary rerouting of traffic needed on account of street closures. The DEIS notes there are alternative access point to Seattle Center even though such alternatives will not provide the necessary access for the NWR Occupants, Seattle Rep, or Cornish. Although the closures are "temporary" that temporary period will last five or more years. Five years is a very long period for these non-profit arts and cultural organizations to be unable to fulfill their missions.

Besides the impacts to the Clients the DEIS does not detail viable detours that will be required for the street closures. Moreover, there is no analysis of the resulting levels of service at intersections that are part of the detour route. Traffic around Seattle Center can be problematic when all streets are

open, but when key links are closed for significant periods of time, traffic will be incredibly bad and the DEIS does nothing to evaluate this significant impact.

E. Chapter 4 AFFECTED ENVIRONMENT

4.3.3 Economics

p. 4.3.3-15 The DEIS notes with either alternative, road and lane closures around the Seattle Center Station would cause increased congestion in the area and could make access to Climate Pledge Arena and other Seattle Center venues and amenities more difficult. Project construction is not expected to notably affect attendance at larger events and performances, such as hockey games. However, there could be effects on event attendance and revenue for smaller non-profit events.

comment: The DEIS is inadequate for failing to quantify more precisely the significant financial impacts on smaller events and festivals. The impacts noted are more severe than suggested. The street closures and increased congestion will have a large and potentially devastating effect upon smaller venues and festivals that may cease to exist on account of the significant financial impact. The assumption that attendance at larger events such as hockey games will not be notably affected is also not substantiated. Large events may also suffer a decrease in attendance creating a significant adverse financial impact.

p. 4.3.3-15 The DEIS notes with Preferred Alternative DT-1, the closure of 2nd Avenue North and August Wilson Way during construction could affect access for maintenance and event vehicles in this area.

comment: The DEIS is inadequate for failing to note the closures of Republican Street, and 1st Avenue N. The cumulative effect of these street closures will have a significant impact on the Clients due to lack of access by delivery vehicles and vehicles bringing performers and their equipment to the NW Rooms, Seattle Rep, and Cornish.

p. 4.3.3-15 The DEIS notes that during construction, Sound Transit would coordinate with Seattle Center to minimize impacts to events on the campus and to permanent tenants. Impacts to freight mobility and access would be minimal and are described in Section 3.19.4.6, Freight and Mobility Access, in Chapter 3.

comment: The DEIS is inadequate for failing to recognize the significance of the impacts caused by the street closures required for Preferred Alternative DT-1. The construction impacts will have a large detrimental impact on attendance for organizations that have struggled with holding events and getting patrons to attend during the two plus years of COVID-19 pandemic.

p. 4.3.3-18 The DEIS notes that construction might cause adverse impacts on businesses due to reduced access or general construction activity. Mitigation measures presented in Chapter 3 and Section 4.3.1 and in Section 4.3.5, Visual and Aesthetics, and Section 4.3.7, Noise and Vibration, would

minimize these impacts. Construction management plans would be developed to address the needs of businesses and could include, but are not limited to, seven specified measures.

comment: The proposed mitigation measures are inadequate if vehicles, performing artists and their equipment, and viewers cannot get to the NW Rooms, Seattle Rep, and Cornish. The Clients are being surrounded by a significant construction zone for five or more years which will cause significant adverse economic impacts to the Clients.

4.3.4 Social Resources, Community Facilities, and Neighborhoods

p. 4.3.4-9 The DEIS notes that Seattle Center is a publicly owned recreational area, arts hub, and tourist destination, attracting over 12 million annual visitors. It is home to roughly 30 arts and cultural organizations and hosts thousands of events annually, including several of Seattle's largest signature community events and festivals. Seattle Center also functions as an emergency shelter when needed.

comment: The DEIS is inadequate for failing to account adequately for the significant adverse social impacts that will result from construction of a station on the Seattle Center Campus and the consequent inability of Seattle Center to accommodate the many events that depend on access to the venues and the inability of the venues to function due to construction impacts. The DEIS needs to recognize the arts, science, and sports "ecosystem" that exists at Seattle Center and how the loss of one or two organizations can cause the entire to ecosystem to potentially fail.

p. 4.3.4-23 The DEIS notes that Cornish Playhouse, Seattle Repertory Theatre, The Vera Project, the Seattle International Film Festival Film Center, and KEXP radio station and recording studio facility may be affected by construction noise or vibration. Construction would also temporarily prevent access along 2nd Avenue North (now a pedestrian walkway within Seattle Center and used by Seattle Center maintenance and event vehicles) and impact access to Seattle Center in this location. Construction of Alternative DT-2 could also have vibration or ground borne noise impacts on the Seattle Repertory Theatre, Seattle Opera and KING FM, and McCaw Hall.

comment: The DEIS is inadequate for failing to consider the other significant impacts from closing Republican Street, August Wilson Way, and 1st Avenue N.; for providing inadequate disclosure of the noise and vibration impacts to the Clients; and for failing to disclose the potential loss of events and festivals for five or more years during construction, a significant adverse social impact. The impact on youth and education as field trips by school children become infeasible due to construction impacts is also ignored by the DEIS.

F. 4.3.6 Air Quality

4.3.6.6 Mitigation Measures

The DEIS states the air pollutant and greenhouse gas emissions analyses demonstrated that no substantial air quality impacts are expected to occur during the operation and construction of the project; therefore, no mitigation measures would be required.

This statement of no air quality impacts is a gross oversimplification of the facts. The NWR Occupants, Seattle Rep, and Cornish are essentially going to be existing in a construction site with station construction occurring on one side of them and construction staging occurring on Warren Avenue and 1st Avenue N. Exhaust emissions from construction equipment and dust from the excavation and construction will significantly impact air quality for these organizations. Increased dust is problematic for SIFF's projection equipment and screens, for the sound equipment at KEXP and the Vera Project, for Climate Pledge Arena's sophisticated audio-visual system, and for the throats and lungs of vocalists and dancers who perform for Seattle Opera, PNW Ballet, Seattle Rep, Cornish, and the other arts groups that utilize McCall Hall, Seattle Rep theaters, and Cornish Playhouse.

G. 4.3.7 Noise and Vibration

Table 4.3.7-2 of the DEIS notes that the Clients' buildings are Category 1 and Special Building Vibration-Sensitive Receivers.

comment: Noise and vibration impacts, particularly during construction, are significant adverse impacts to the Clients. These are all arts and cultural organizations that require a quiet environment and feature live performances with music, dance, theater, and recording sessions. They are all Category 1 and Special Building receivers. Exhibits A and B to this letter are noise and vibration analyses performed by Landau Associates for KEXP and Seattle Rep, respectively, detailing the significant noise/vibration impacts to be experienced by the NWR Occupants, Seattle Rep, and Cornish as a result of construction of the Preferred Alternative DT-1 and Alternative DT-2.

p. 4.3.7-12 The DEIS states the Preferred Alternative DT-1 would have vibration impacts at Seattle Center Category 1 special buildings including KEXP radio station, Seattle Repertory Theatre, the Seattle International Film Festival (SIFF) Film Center, and The Vera Project.

comment: The DEIS fails to include Cornish, MoPOP, and SIFF Uptown Theater among the impacted buildings. MoPOP's building is almost exclusively a steel structure, which has a high possibility of amplifying ground vibrations throughout and suffering negative impacts to the integrity of the building's features and artifacts.

4.3.7.4.1 Noise

p. 4.3.7-17 The DEIS notes the cut-and-cover construction of the Seattle Center Station for Preferred Alternative DT-1 would likely result in noise impacts at the NW Rooms at Seattle Center, which house several noise-sensitive spaces including KEXP, the Vera Project, the SIFF Film Center, and the A/NT Art Gallery. The construction noise would also impact spaces in the north end of Seattle Center, including Seattle Rep and Cornish. Cut-and cover construction of the Seattle Center Station for Alternative DT-2 could result in noise impacts at the Seattle Repertory Theatre and Cornish Playhouse.

comment: Given the particularly significant noise impacts from the cut-and-cover method, the DEIS should evaluate alternative construction techniques such as mining to mitigate these significant adverse noise impacts.

4.3.7.4.2 Vibration

Table 4.3.7-9. Groundborne Noise and Vibration Impacts at Category 1 and Special Buildings During Construction – Ballard Link Extension Sensitive Receiver Alternatives with Impact
This table fails to include Pacific Northwest Ballet and SIFF Uptown Theater.

p. 4.3.7-21 The DEIS states, that where construction would be in close proximity to sensitive Category 1 performance or recording spaces, Sound Transit would work with the venue to coordinate periods of the loudest construction noise around their events. If the loudest work could not be scheduled around performances, Sound Transit would coordinate with the venue regarding modifications to their facility or temporary relocation.
comment: Given that the most affected Clients operate during the day and the evening, rescheduling is not likely to be feasible. This is especially so for Seattle Children's Theater and other Clients who provide events for school children during the day Monday through Friday. Similarly, modifying their facilities is not likely to be successful given the proximity of the noise and vibration, literally next to their building walls. Based on the Landau data and the FTA thresholds in the DEIS, tenants of the NW Rooms will face construction noise and vibration impacts that will likely make ordinary course operations impossible. For example, the ambient noise level in the KEXP Audio Edit 2 studio, as measured by Landau, is 24 dBA, which lines up with the applicable FTA threshold of 25 dBA for this space. The DEIS contemplates ground borne noise levels from tunneling at 42 dBA, a very perceptible 18-dBA increase over ambient levels. This increase would be perceived as approximately 3.5 times louder than ambient levels and the applicable FTA threshold. Similar impacts are anticipated from airborne noise generated from surface construction north of the building. Landau anticipates that ground borne noise impacts from Republican Street demolition and below-grade slurry wall demolition may be even higher, although the DEIS does not provide an estimate of these impacts. The DEIS statement that NW Rooms tenants "may" be required to relocate during construction should read "will likely be required to relocate."

Thus, due to the expected significant impacts from road closures and construction noise and vibration, temporary relocation will likely be required if the Preferred Alternative DT-1 Seattle Center Station location remains the preferred one. However, temporary relocation may not be possible for the Clients. These arts and cultural organizations have very specialized spaces and finding a replacement space in Seattle may not be possible. This could result in the permanent loss of those organizations.

H. 4.3.11 Geology and Soils

4.3.11.4.3 Groundwater

p. 4.3.11-8 As noted above, the DEIS notes that high groundwater levels make soils less stable during excavation and could also require dewatering during construction. Dewatering would likely be needed during construction of all Downtown Stations: Midtown, Westlake, Denny, South Lake Union, and Seattle Center. Saturated soils could flow when disturbed and increase the potential for volume loss and settlement.

comment: This was substantiated during the renovation of the Arena when KEXP experienced cracked floors. The DEIS states no mitigation is required. This is an inadequate response. The NW Rooms is a Seattle landmark, is over 60 years old, and deserves further analysis and protection from this potentially significant impact.

I. 4.3.16 Historic and Archeological Resources

Table 4.3.16-5. Effects to Built Environment Historic Properties: Downtown Segment p. 4.3.16-30 This table states for Survey Number 1396a the International Commerce and Industry Building, which is another name for the NW Rooms, is Adversely Affected with the Preferred Alternative DT-1 due to Construction Disruption and Permanent Proximity Effects.

comment: The DEIS fails to note Cornish Playhouse is eligible for listing in the National Historic Register and the International Plaza in front to the NW Rooms is landmarked. Moreover, no mitigation is proposed for these significant adverse impacts. Evaluation of appropriate and feasible mitigation should be done.

p. 228, Appendix N.5 The DEIS notes that one historic property, the NW Rooms, would be adversely affected due to construction impacts. The north façade canopy would be removed during construction and rebuilt after construction. Overall, Preferred Alternative DT-1 would diminish the building's integrity of materials, setting, and feeling.

comment: The DEIS is inadequate for providing no explanation of the duration, nature or severity of the diminished integrity and not providing appropriate mitigation. As an important historical structure with a landmark designation, the buildings' integrity should not be diminished.

J. 4.3.17 Parks and Recreational Resources

p. 4.3.17-10 The DEIS notes Figure 4.3.17-6 shows the permanent impacts to this resource from Alternative DT-1, which would permanently impact Seattle Center for a Seattle Center Station entrance. The entrance would be on the east side of the Seattle Repertory Theatre and could remove the southern exit to the Seattle Repertory Theatre, as well as landscaping, which includes Donnelly Garden and Theater Commons. Views of the International Fountain and the Space Needle from the Seattle Repertory Theatre lobby could be blocked by the station entrance. The station would be primarily under

Republican Street but would extend to the south under the NW Rooms. Potential vibration impacts during operation are discussed in Section 4.3.7, Noise and Vibration. Alternative DT-2 could require a small area of underground easement on the northwest corner of the Seattle Repertory Theatre, but this would not affect the current use of this property.

comment: The DEIS is inadequate for failing to include removal of exceptional trees along August Wilson Way as a permanent impact, discuss the loss of approximately half an acre of open space, or mention the loss of space to accommodate the festivals at Seattle Center.

p. 4.3.17-19 The DEIS notes that Figure 4.3.17-6 shows the temporary construction impacts to this resource from the Downtown Segment alternatives. Preferred Alternative DT-1 would have temporary impacts to Seattle Center for construction of a Seattle Center Station entrance for up to 6 years, plus time for park restoration. Construction activities and staging would occur for this cut-and-cover station entrance in front of the Seattle Repertory Theatre, in a landscaped area known as Donnelly Garden and Theater Commons.

comment: The DEIS is inadequate for failing to provide any mitigation for these impacts. Alternative construction techniques such as mining to create the station should be evaluated.

p. 4.3.17-19 The DEIS notes that cut-and-cover construction would also occur on Republican Street, east of 1st Avenue North, to the north of the Northwest Rooms. The Northwest Rooms house KEXP radio station, the Vera Project, and the Seattle International Film Festival Film Center. These facilities in the NW Rooms are expected to continue to operate during construction, but temporary relocation may also be considered due to noise and vibration impacts.

comment: The DEIS is inadequate for failing to consider alternative construction techniques such as mining to construct he station. The suggestion that the residents of the NW Rooms could relocate is not sufficient mitigation as there may not be suitable space that can accommodate all the functions provided in the NW Rooms.

p. 4.3.17-19 The DEIS notes that access from Mercer Street to August Wilson Way on the east side of the Seattle Repertory Theatre (2nd Avenue North) would be closed during construction, but other access points exist to the west and east along Mercer Street. This would affect non-motorized access as well as campus maintenance and delivery access that uses this roadway. It is expected the theatre would maintain operation during construction, accessible from the main entrance off Mercer Street. Access to Seattle Center from the west along Republican Street and August Wilson Way would also be closed, but access farther south at the current Climate Pledge Arena and Thomas Street would be maintained. Seattle Center events and activities are expected to be able to continue during construction. Mature trees along August Wilson Way that are designated as Exceptional Trees by the City would be removed for construction. New landscaping would be provided after construction in coordination with the City of Seattle and Seattle Center. Public artwork at 2nd Avenue North and August Wilson Way would also be removed during construction but would be replaced following construction. Sound Transit would coordinate with Seattle Center during final design regarding construction phasing and timing for work

on and near the campus to minimize the construction impacts described above on events at the campus as well as permanent campus tenants.

comment: The DEIS is inadequate for providing inadequate mitigation for significant construction impacts. Loss of access is a significant operational impact for arts and cultural organizations who must move equipment and materials in and out of their performance spaces. Providing new landscaping is insufficient mitigation for the loss of exceptional trees. While coordination is appreciated, it is not mitigation for the significant impacts that cannot be avoided.

p. 4.3.17-20 The DEIS notes that Alternative DT-2 would require partial closure of Mercer Street for 3.5 years, between Warren Avenue North and 1st Avenue North, for construction of the Seattle Center Station, which would affect access to the north side of Seattle Center from Mercer Street. Closure of Mercer Street would affect traffic in this area and could make passenger and vehicle access to parking and event loading areas for Seattle Center more difficult. Sound Transit would coordinate with the Seattle Center for road closures during construction in order to minimize impacts on access.
comment: The DEIS is inadequate for noting the impacts but providing inadequate mitigation. Coordination will not ameliorate the impacts. In addition, the conceptual drawing of the Mercer station shown in Appendix J, Drawing B11-ASP700 shows cut-and-cover disrupting one additional block and two major intersections of Mercer (Mercer and Queen Anne, and Mercer and 1st Ave W) for a scissors cross-over. Which is accurate, the drawing, or the text of the DEIS?

K. 4.3.18 Section 4(f) Summary

Under Section 4(f) of the United States Transportation Act of 1966, 49 U.S.C. 303(c), the FTA cannot approve the "use" of a Section 4(f) resource unless it determines that:

- There is no feasible and prudent avoidance alternative to the use of land from the property; and the action includes all possible planning to minimize harm to the property resulting from such use; or

- The use of the property, including any measure(s) to minimize harm (such as any avoidance, minimization, mitigation, or enhancement measures) committed to by the applicant, will have a de minimis impact on the property.

Table 4.3.18-4 In this table the DEIS states that the Preferred Alternative DT-1 will have *de minimis* impact on the Seattle Center and Alternative DT-2 will have no use/temporary occupancy of Seattle Center.

comment: There is certainly a feasible and prudent avoidance alternative and the action has not included all possible planning to minimize harm to the property, so the first finding cannot be made. The DEIS concludes, however, there is a *de minimis* impact in order to satisfy the second finding. This conclusion is clearly wrong. The impacts of constructing a light rail station in the location proposed for

Preferred Alternative DT-1 are significant. Open space will be lost permanently. Festival space will be lost permanently. The Donnelly Garde and Theater Commons as well as the beautiful mature exceptional trees along August Wilson Way will be lost permanently. Construction of the proposed station also may result in the loss of valuable arts and cultural organizations for five or more years, and they may or may not return. Such impacts are not *de minimis.* The Section 4(f) analysis is incorrect and inadequate.

L. Failure to Provide Timely Information to Decision Makers.

The DEIS is also inadequate because it fails to provide adequate information to decision makers by the time alignment and station locations are to be recommended by the Sound Transit Board in June of 2022. This inadequacy is all the more striking because the Sound Transit Board will be acting contrary to the requirements of WAC 197-11-070 by taking action that will limit the choice of reasonable alternatives prior to the issuance of the Final EIS.

Conclusion

The DEIS has not adequately analyzed the significant adverse environmental impacts associated with putting the Seattle Center Station at the location proposed in Preferred alternative DT-1. The significant impacts that will be created for the arts and cultural organizations in close proximity to the proposed station are enormous and cannot be mitigated without relocation of the organizations which creates other issues because adequate spaces do not exist in Seattle. Yet the organizations are put into a purgatory where they do not know whether the construction impacts can be mitigated or whether they need to relocate owing mostly to the construction methods not being finalized for a couple of years after the Sound Transit Board selects a proposed route. The DEIS does not discuss this very possible occurrence which in turn could lead to the permanent loss of valuable arts and cultural organizations. The only logical solution is to place the Seattle Center Station at a location other than that shown for Preferred Alternative DT-1.

Thank you for the opportunity to comment on the DEIS. If you have any questions regarding the foregoing comments, please contact the undersigned.

Sincerely,

Donald E. Marcy
dmarcy@cairncross.com

cc: Jane Zalutsky, Executive Director Seattle Center Foundation
Brenda Barnes, CEO Classical KING FM 98.1
Raymond Tymas-Jones, President Cornish College of the Arts
Jeffrey Herrmann, Managing Director Seattle Repertory Theater
Clare Hausman, Sr. Director Strategic Initiatives, Seattle Children's Theater
Tom Mara, Executive Director KEXP
Christina Scheppelmann, General Director Seattle Opera
Ellen Walker, Executive Director Pacific Northwest Ballet
Jason Clackley, Program Manager The Vera Project
Alexis Lee, Executive Director MoPOP
David Cornfield, Board Member Seattle International Film Festival

EXHIBIT A

April 26, 2022

KEXP
472 1st Avenue N
Seattle, WA 98109

Attn: Jamie Alls

Transmitted via email to: ***jalls@kexp.org***

Re: Sound Transit WSBLE DEIS Review for KEXP
Seattle, Washington
Project No. 2055001.010

Dear Jamie:

At the request of KEXP, Landau Associates, Inc. (Landau) prepared this summary of our assessment of the noise and vibration sections of the Sound Transit West Seattle and Ballard Link Extensions (WSBLE) Draft Environmental Impact Statement (DEIS).

Landau understands that KEXP has concerns regarding the proposed WSBLE project, specifically the preferred alternative Downtown-1 (DT-1) alignment that includes the Seattle Center Station. The station would be located immediately adjacent to the north of KEXP. Specific to this letter report, Landau understands that KEXP is concerned that construction and operation of DT-1 may result in noise and vibration impacts that could inhibit the use of some facilities within KEXP, such as for recording and live broadcasts.

KEXP has retained Landau noise and vibration expert consultants to review the DEIS and provide comment on the document's accuracy and completeness regarding assessment of noise and vibration impact. Further, Landau has been asked to provide additional supporting information as needed to inform this review.

This letter report summarizes Landau's assessment of the DEIS noise and vibration section and technical appendix as it relates to the potential for impact to KEXP, and includes a summary of our findings, a list of documents that were reviewed, and a detailed review of selected chapters of the DEIS.

Summary

Landau finds the assumptions and methods used by Sound Transit to analyze noise and vibration impacts to be reasonably correct. However, Landau finds some elements of the WSBLE DEIS analysis to be incomplete and/or incorrect. These missing or incorrect analysis elements result in an

incomplete assessment of noise and vibration impacts and mitigation. The key findings of this review include:

- City of Seattle (City) noise limits are not applied in the construction noise impact section when determining the potential for noise impacts and whether additional mitigation is warranted.
- There are missing receptors, including the Northwest Plaza, an outdoor use area between KEXP and the Climate Pledge Arena.
- The noise limit used for the KEXP Mastering Suite (now Production 1 and 2) is incorrect.
- The assessment of airborne noise impacts during construction is incomplete.
- An assessment of mitigation measures is required for expected airborne noise impacts at KEXP.
- Additional assessments of groundborne noise and vibration mitigation measures from construction are warranted to fully address impacts from preferred alternative DT-1.
- Station construction methods for DT-1 include breaking a slurry wall with a hoe ram, a potential major source of groundborne noise and vibration that was not evaluated.
- Operational groundborne noise impacts warrant additional assessment of proposed high-resilience fasteners as mitigation for DT-1.

Landau's assessment focused on the DT-1 alignment identified in the WSBLE DEIS. Downtown-2 (DT-2) is located sufficiently far from KEXP facilities that impacts from construction and operation of DT-2 are unlikely at KEXP.

Review Documents

Landau reviewed the following documents in support of the assessment:

- Sound Transit and Federal Transit Administration's (FTA's) WSBLE DEIS, Chapter 4.2.7: Noise and Vibration (pp. 4.2.7-1 to 4.2.7-23) (USDOT et al. 2022a)
- Sound Transit and FTA's WSBLE DEIS, Appendix N.3: Noise and Vibration Technical Report (USDOT et al. 2022b)
- Sound Transit and FTA's WSBLE DEIS, Attachment N.3A: Noise Measurement Data, Site Details, and Photographs
- Sound Transit and FTA's WSBLE DEIS, Attachment N.3B: Vibration Measurement Site Photographs
- Sound Transit and FTA's WSBLE DEIS, Attachment N.3C: Vibration Propagation Measurement Results
- Sound Transit and FTA's WSBLE DEIS, Attachment N.3D: Maps of Noise Impact Assessment
- Sound Transit and FTA's WSBLE DEIS, Attachment N.3E: Maps of Vibration Impact Assessment
- Sound Transit and FTA's WSBLE DEIS, Attachment N.3F: Tables of Noise Predictions
- Sound Transit and FTA's WSBLE DEIS, Attachment N.3G: Tables of Vibration Predictions

- Sound Transit and FTA's WSBLE DEIS, Attachment N.3H: Vibration Analysis of Category 1 Land Uses and Special Buildings
- FTA's *Transit Noise and Vibration Impact Assessment Manual* (FTA Guidance Manual; FTA 2018)
- Sound Transit's Design Criteria Manual, Revision 5, Amendment 11 (Sound Transit 2021).

Review Format

The following review of the DEIS has been organized by the chapters in DEIS Appendix N.3. The headings in the follow review therefore represent the chapter numbers in DEIS Appendix N.3.

Landau's assessment focused on chapters in the WSBLE DEIS that are relevant to the assessment of noise and vibration impacts at KEXP from DT-1. Headings that begin with "Chapter" refer to the corresponding chapter in WSBLE DEIS Appendix N.3: Noise and Vibration Technical Report (USDOT et al. 2022b).

Chapter 3: Noise and Vibration Impact Criteria

The WSBLE DEIS applies the noise and vibration impact criteria established for transit projects according to the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (FTA 2018). Sound Transit is a public transit authority that receives federal funding to support its projects. Landau finds the use of the FTA criteria to be appropriate for assessment of noise and vibration impacts from this project.

WSBLE DEIS Appendix N.3, Chapter 3.1.3 identifies the City noise criteria, as established in Chapter 25.08 of the Seattle Municipal Code (SMC). SMC noise limits are applicable during daytime and nighttime hours for various source and receiving "Districts." Further, SMC 25.08 includes sound level limits that apply specifically to construction. Landau finds the DEIS interpretation of the City's noise criteria to be correct.

Landau finds that the assessment does not identify impacts relative to the City's noise criteria. That is, the assessment is focused only on FTA criteria (that are applicable) and on whether construction or operation would meet FTA criteria. The assessment refers to the required compliance with City construction noise limits in WSBLE DEIS Appendix N.3, Chapter 7, Construction Noise Mitigation (p. 7-16), but not when evaluating the potential for noise impacts throughout Seattle Center. Because City construction noise limits apply to this project, the noise assessment should consider whether construction noise is expected to meet these limits. If the project cannot meet these limits, sufficient noise mitigation measures should be required; otherwise, alternative construction methods should be explored.

Chapter 4: Noise and Vibration Impact Analysis Assumptions and Methods

WSBLE DEIS Appendix N.3, Chapter 4 summarizes the analysis assumptions and the methods for assessment of noise and vibration impacts. This chapter reviews multiple elements that are considered when predicting noise and vibration emissions from light rail projects and includes results of vibration propagation testing and discusses noise and vibration measurements made by Sound Transit to support the noise and vibration impact assessment. Landau finds the impact analysis assumptions and methods to be reasonably correct.

Chapter 6: Impact Assessment

The following summarizes Landau's review of the WSBLE DEIS impact assessment of DT-1, including airborne noise from construction and groundborne noise and vibration from construction and operation, as received at KEXP. The Station Area Below Grade figure on p. 3 of the KEXP Sound Transit Construction Impact, April 26, 2022 presentation (KEXP Presentation; Attachment 1) provides an area map that shows the location of KEXP relative to the location of DT-1, including the rail alignment, station platform, and construction area extents, as well as nearby Seattle Center resident organizations and facilities.

Noise and Vibration Limits

WSBLE DEIS Appendix N.3, Chapter 6.4 (p. 6-63) indicates that noise and vibration from construction, including tunneling (cutterhead and supply train) and surface construction, were compared to the same FTA operational noise limits "because this can be a relatively long-term activity." Landau agrees with this determination.

Landau notes that the noise limits in WSBLE DEIS Appendix N.3 are generally correct for most resident organizations within the Seattle Center. However, a required adjustment and an omission were noted for KEXP, as summarized below.

Noise and Vibration Limits – Adjustments

Landau notes that adjustments to the operational (and construction) groundborne noise and vibration limits at the Mastering Suite within KEXP are warranted following measurements by Landau staff and review of the noise- and vibration-sensitive nature of this space. That is, because the Mastering Suite (now Production 1 and Production 2) is used for audio recording, a noise limit of 30 A-weighted decibels (dBA), as provided in the DEIS, is not appropriate. An adjusted noise limit to 25 dBA aligns with the FTA criteria for a "Recording Studio."

A summary of the recommended adjustments to the groundborne noise and vibration limits, including a rationale for the adjustments, is provided in Table 1 below.

Table 1: DEIS Appendix N.3 KEXP Noise and Vibration Limit Adjustments

KEXP Space	DEIS Limits for Operation and Construction (a)		Recommended Adjustments to DEIS Limits (b)		Notes Justification for Adjusted Limits
	Noise (dBA)	Vibration (VdB)	Noise (dBA)	Vibration (VdB)	
Mastering Suite	30	72	25 dBA	65 VdB	Noise limit is appropriate as "Recording Studio" per FTA Guidance Manual, confirmed through Landau measurements.

(a) Sound Transit WSBLE DEIS Appendix N.3, Attachment N.3H, Tables 8-2 and 8-3.

(b) Based on use of Mastering Suite (Production 1 and 2) as an audio recording space.

dBA = A-weighted decibels

VdB = vibration decibels

Noise and Vibration – Missing Sensitive Receivers

Landau finds that WSBLE DEIS Appendix N.3 omits the International Plaza, also known as the Northwest Courtyards. The International Plaza is a hardscape area between the Northwest Rooms and Climate Pledge Arena. Northwest Courtyards will be used by KEXP to host future outdoor performances. This area also includes the historic DuPen Fountain, a popular family recreation spot in the summer, and is used heavily during campus events and festivals.

The International Plaza is likely to be impacted by DT-1 construction noise and is classified as an FTA Category 1 noise-sensitive receiver. FTA defines Category 1 receivers as "Land where quiet is an essential element of its intended purpose. Example land uses include preserved land for serenity and quiet, outdoor amphitheaters and concert pavilions, and national historic landmarks with considerable outdoor use." A summary of the missing noise-sensitive receiver is provided in Table 2 below.

Table 2: DEIS Appendix N.3 Missing KEXP Noise and Vibration Sensitive Receiver

Omitted Facility	Suggested Noise and Vibration Limits	Summary of Use	Potential Source(s) of Noise or Vibration Impact (b)
International Plaza	FTA Category 1 Noise Limits (a)	Recreational Outdoor Use Area, Concerts	DT-1 Surface Construction

(a) Outdoor use areas at Seattle Center are subject to FTA noise limits for a Category 1 receiver. Applicable noise limits are based on ambient levels; the City of Seattle construction noise limits identified in the Seattle Municipal Code (SMC) Chapter 25.08 also apply.

(b) Potential for impact may be due to activities identified in this table and may also include activities not identified here. A complete assessment is required.

Chapter 6.2: Construction Noise Impacts

The construction noise impact assessment (i.e., airborne noise) was completed using the methods described in the FTA Guidance Manual.

Chapters 6.2.1.5 (Tunneling) and 6.2.1.6 (Cut-and-Cover)

WSBLE DEIS Appendix N.3, Chapter 6.2.1.5 summarizes surface-level construction noise that would occur in support of tunneling operations; WSBLE DEIS Appendix N.3, Chapter 6.2.1.6 summarizes surface-level construction noise that would occur in support of cut-and-cover station construction.

As identified in WSBLE DEIS Appendix N.3, Table 6-30, the location of the cut-and-cover construction area for DT-1 could be as near as 8 feet from KEXP. Therefore, noise from excavation of the cut-and-cover station would be near enough to result in potential impact to operations at KEXP.

WSBLE DEIS Appendix N.3, Chapter 6.2.1.5 identifies the use of excavators and backhoes for portal and shaft excavation, and of trucks and loaders for transporting spoils. In addition, WSBLE DEIS Appendix N.3, Chapter 6.2.1.5 identifies ventilation fans that "would likely run continuously to provide fresh air to construction crews working inside the tunnel." For cut-and-cover construction, Chapter 6.2.1.6 identifies haul trucks and vibratory rollers as the loudest sources of construction noise, "over 88 dBA at 50 feet."

Landau finds that the DEIS does not fully evaluate the potential for impact from surface noise construction of stations or station entrances. Specifically, the following activities (i.e., sources of surface construction noise) were either not identified in the DEIS or additional information is required.

Tunnel Exhaust Fans

DEIS Chapter 6.2.1.5 states that "Ventilation fans would likely run continuously to provide fresh air to construction crews working inside the tunnel". Further, the DEIS states that "sound levels near the tunnel portals may be over 86 dBA at 50 feet from construction activities". DEIS Chapter 2.6.6, p 2-88 states that "fans could run for 24 hours a day and could be audible at tunnel portals, stations, or access locations."

Given the high volume of air required to maintain fresh air for construction workers, and the proximity of KEXP to the station and potentially to the tunnel portals, additional information is required to fully identify noise impacts from exhaust fans.

Truck Haul Routes

DEIS Chapter 2.6.6 (p. 2-88) states, "truck hauling would require a loading area, staging space for trucks awaiting loading, and provisions to prevent tracking soil on public streets. Truck haul routes and trucking hours would require approval by the City of Seattle. Surface hauling could occur at night

during off-peak traffic periods or could be concentrated during the day to minimize noise in noise-sensitive areas." Table 7-1 of the FTA Guidance Manual (p. 176) identifies a sound level for haul trucks of 84 dBA at 50 feet.

The DEIS does not include assessment of noise from haul trucks. Noise from haul trucks includes engine idling during loading, travel to and from loading locations, and banging noise when trucks drive over uneven or unsecured surfaces that are often found at and near construction sites. Airborne noise from haul trucks collecting and moving spoils away from the DT-1 station, located very near KEXP, could represent major sources of noise.

As indicated in the DEIS, haul trucks may operate during daytime or nighttime hours, depending on the permitted hours of hauling. KEXP operates noise-sensitive recording spaces 24 hours per day, and therefore impacts from truck hauling may impact KEXP during any hour of the day or night.

Construction Staging Areas

Noise from construction staging areas was not evaluated in the DEIS. Airborne noise from equipment moving within and to/from staging areas could represent a major source of airborne noise during construction.

Given the potential near proximity of KEXP to construction staging areas, an assessment of noise impact from staging areas should be completed.

Cut and Cover Construction

WSBLE DEIS Appendix N.3, Chapter 6.2 (p. 6-30) identifies construction activities that would produce the highest levels of airborne construction noise and includes tunneling and cut-and-cover station construction proposed for preferred alternative DT-1, which would occur immediately adjacent to KEXP. Landau finds this section to be incomplete based on predicted levels of construction noise.

Appendix N.3, Table 6-8 (p. 6-31) of the WSBLE DEIS provides a range of sound levels, referenced to 50 feet, that are anticipated from tunneling and cut-and-cover construction. Sound levels are based on the FTA Guidance Manual. As identified in Table 6-30 (p. 6-70), and as illustrated in DEIS Drawing B11-ASX102, construction activities could occur as near as 8 feet from KEXP. Table 3 below identifies noise levels from construction summarized in DEIS Table 6-8, and calculates sound levels at 50 feet, 15 feet, and 8 feet from construction equipment. Distance adjustments are based on noise propagation from a stationary source at +6 dBA per halving of distance to the source.

Table 3: Surface Construction Airborne Noise Equipment and Sound Levels

Construction Activity (a)	Construction Equipment (a)	Sound Level at 50 feet L_{eq} (dBA) (a)	Sound Level at 15 feet L_{eq} (dBA) (b)	Sound Level at 8 feet L_{eq} (dBA) (b)
Tunneling	Excavators, backhoes, haul trucks, loaders	84 to 86	94 to 96	100 to 102
Cut-and-Cover Station Construction	Excavators, backhoes, haul trucks, loaders, vibratory rollers	84 to 88	96 to 99	102 to 104

(a) Sound Transit WSBLE DEIS Appendix N.3, Table 6-8.

(b) Calculated using standard adjustment for distance from a point source: SPL2 = SPL1 + 20*Log(D1/D2).

L_{eq} = equivalent sound pressure level

WSBLE DEIS Appendix N.3 does not include a detailed assessment of noise from tunneling and cut-and-cover construction. Rather, WSBLE DEIS Appendix N.3, Chapter 6.2.3.2, p. 6-38 indicates that cut-and-cover construction of DT-1 "would likely result in airborne construction noise impacts at Northwest Rooms at Seattle Center, which house several noise-sensitive spaces including KEXP, the Vera Project, the SIFF Film Center, and the A/NT Art Gallery. The construction noise would also impact spaces in the north end of the Seattle Center including Seattle Repertory Theatre (Seattle Rep) and Cornish Playhouse."

As noted in Table 3, for alternative DT-1, airborne noise levels from tunneling and cut-and-cover station construction could reach up to 104 dBA at the building facade of KEXP. The SMC sound level limits for construction, as correctly noted in WSBLE DEIS Appendix N.3, Table 3-4 (p. 3-7), is 85 dBA for a commercial district noise source affecting a commercial district receiving property, with shorter-duration increases permitted for impact-type equipment. This limit would apply to noise received at KEXP from DT-1 construction. Predicted sound levels from construction therefore could well exceed City sound level limits at KEXP when equipment operates within approximately 50 feet of the building facade.

Noise reductions provided by the building envelope of KEXP (i.e., transmission loss, or "TL," provided by building construction materials) are not identified in the DEIS. Therefore, measurements were made at KEXP in February 2022 by Landau staff members to document interior/exterior reductions in noise provided by the building's north wall (i.e., TL). The findings suggest that the building provides approximately 61 dBA exterior-interior reduction in noise. Therefore, for sound levels at the exterior facade that are 104 dBA, interior levels from exterior construction equipment could be up to 43 dBA. As summarized below and in DEIS Appendix N.3, Chapter 6.3, the applicable sound level limits for noise-sensitive recording spaces within KEXP is 25 dBA. Noise from construction could reach up to 18 dBA over applicable interior sound level limits. The DEIS does not quantify the potential for impacts at interior recording spaces at KEXP; additional detail regarding mitigation measures is provided later in this report, in the section covering Chapter 6.4.2. Surface Construction Vibration Impacts.

Table 4 summarizes expected increases over ambient noise levels at rooms along the north facade of the KEXP facility. Increases are based on surface construction noise reaching 43 dBA inside the north facade of KEXP due to exterior noise levels that are up to 104 dBA; ambient noise levels are based on measurements made by Landau staff in December 2021 (see Figure 1). Reductions through the north wall facade of KEXP are based on Landau's measured exterior-interior reduction of 61 dBA.

Table 4. KEXP Surface Construction Airborne Noise Impacts (DT-1)

KEXP Room Along North Wall	Landau Ambient Noise Measurement (a)	DT-1 Construction Noise	
		Noise Level Inside North Facade of KEXP (dBA) (b)	Increase Over Existing Ambient Interior Level (dBA)
DJ 2	37	43	6
Audio Edit 2	30	43	13
Production 1	27	43	16
Production 2	27	43	16
Video Edit 2	24	43	19
Video Control Room	43	43	0

(a) Ambient measurements taken by Landau Associates staff on December 21, 2021. See Figure 1 (attached).
(b) Based on exterior sound level of 104 dBA and reduction of 61 dBA through KEXP north facade.

The Construction Noise – Multiple Years figure on p. 6 of the KEXP Presentation (Attachment 1) shows the potential noise impact to KEXP as a "heat map," highlighting potential impact from airborne construction noise during station construction for DT-1. As summarized in Table 4 and shown on the Construction Noise – Multiple Years figure on p. 6 of the KEXP Presentation (Attachment 1), airborne noise from construction is expected to be up to 19 dBA over existing ambient interior sound levels at KEXP along the north facade (at Video Edit 2), including up to 16 dBA over existing ambient levels at audio recording spaces, including Production 1 and Production 2. Actual increases may be higher or lower and will depend on the sound frequencies of exterior source of construction noise.

It is noted in WSBLE DEIS Appendix N.3, Chapter 6.2.3.2, p. 6-38 that "the loudest construction phase is expected to be near the beginning of construction during the cutting and removal of the existing street, which would likely include the use of impact equipment such as jackhammers or hoe rams." Landau notes that during other phases construction noise levels may be lower. Note that the ranges of sound levels provided in Table 4, and estimates of impacts provided in Table 5, are based on the FTA reference sound levels for excavators, backhoes, haul trucks, loaders, and vibratory rollers. Therefore, reference sound levels in Table 4 do not represent the loudest noises that could occur from use of jackhammers and hoe rams, and actual noise impacts during the initial phases are likely to be higher than is predicted in Table 4.

Landau finds that airborne noise impacts from DT-1 station construction, including during the initial phases of demolition work and during ongoing use of heavy machinery, is likely to adversely impact the use of these spaces.

Impact Noise

As indicated above, the loudest construction phase would likely include the use of impact equipment such as jackhammers or hoe rams. WSBLE DEIS Appendix N.3, Chapter 3.1.3 correctly summarizes the City construction criteria. Specifically, this section notes that impact noises, such as those noises generated by jackhammers and hoe rams, will be limited to the daytime hours of 8 a.m. to 5 p.m. weekdays and 9 a.m. to 5 p.m. weekends. The Final Environmental Impact Statement (FEIS) and subsequent construction management plans should include consideration of timing restrictions for these types of impact noises.

Northwest Courtyard

In addition to the above assessment of impact at interior recording spaces within KEXP, noise impacts from airborne construction may occur within the Northwest Courtyard, located between KEXP and the Climate Pledge Arena. The Northwest Courtyard is used as a public gathering space and is also expected to be used for KEXP live performances. Noise from surface construction propagating through the breezeway between KEXP and Vera Project may result in sound levels that impact the ability of KEXP to stage a live performance at the Northwest Courtyard.

Chapter 6.3: Operational Vibration Impacts

The operational vibration section of WSBLE DEIS Appendix N.3 includes predicted impacts from both vibration and groundborne noise during operation of the proposed WSBLE project. WSBLE DEIS Appendix N.3, Tables 6-13 (p. 6-51) and 6-14 (p. 6-53) identify operational groundborne noise and vibration impacts for DT-1 and DT-2, respectively.

The results in WSBLE DEIS Appendix N.3, Table 6-13 (and in WSBLE DEIS Appendix N.3, Attachment N.3H, Table 8-2) indicate that during operation of DT-1, KEXP would likely experience groundborne levels of up to 32 dBA at DJ2 and up to 35 dBA at the Mastering Suite. At DJ2 this level is a 7-dBA increase over the applicable limit; at the Mastering Suite this level is 10 dBA over the corrected limit of 25 dBA for a recording studio (see Table 1).

Landau finds that additional information and/or corrections are required to evaluate completely the potential for operational vibration and groundborne noise impacts to KEXP. The following summarizes these findings.

Groundborne Noise Limits

DEIS Appendix N.3, Table 6-13 (p. 6-51) and 6-14 (p. 6-53) identifies groundborne noise limits for KEXP. As indicated in these tables, a limit of 25 dBA applies to the KEXP DJ booth, and as documented

in Attachment N.3H, this limit also applies to the studio (live performance room) and audio edit room. As noted, the limit applied for the Mastering Suite (Production 1 and 2) is incorrectly listed at 30 dBA and should be 25 dBA, similar to other recording spaces and per FTA criteria.

Revised Assessment of Operational Groundborne Noise Impact

Landau conducted ambient measurements to further validate the limits established in the DEIS and evaluate further potential for operation noise impacts at spaces within KEXP (see Figure 1). Note that Landau also conducted ambient vibration measurements of these same spaces (see Figure 2). Included in Table 5 is a summary of the DEIS operational noise limits and results of measurements made within each space at KEXP. Also included for reference are measurements made in support of the DEIS, as documented in WSBLE DEIS Appendix N.3, Attachment N.3H, Table 8-1.

With the noted exception of the Mastering Suite (Production 1 and 2), the limits established in the DEIS are appropriate and highlight the need for mitigation of light rail operation. Note however that DEIS Appendix N.3, Tables 6-13 and 6-14, should include an expanded assessment to include a complete list of spaces within KEXP.

The final column of Table 5 below identifies the potential increase over existing ambient noise levels during operation of DT-1.

Table 5. KEXP Noise Limits, Ambient Noise Levels, and Operational Noise Levels

KEXP Room	Sound Level (dBA)				
	DEIS Noise Limit (a)	DEIS Ambient Measurement (b)	Landau Ambient Noise Measurement (c)	DEIS Operational Noise Level (d)	Increase over Ambient Levels (e)
DJ 1	25	-	38	26	0
DJ 2	25	33	37	32	0
Audio Edit 1	25	29	28	32	4
Audio Edit 2	25	-	30	32	2
Production A	30 (f)	-	27	35	8
Production B	30 (f)	-	27	35	8
Video Edit 1	30	-	25	32	7
Video Edit 2	30	-	24	32	8
Control Room	30	-	36	26	0
Live Room	25	28	28	26	0
Video Control Room	30	-	43	32	0

(a) Sound Transit WSBLE DEIS Appendix N.3, Attachment N.3H, Table 8-2. For DJ2, Audio Edit 1, Production 1, Video Edit 1 and 2, Control Room and Video Control Room, sound level limits are based on use of similar spaces within KEXP as defined in the DEIS.

(b) Ambient measurements summarized in Sound Transit WSBLE DEIS Appendix N.3, Attachment N.3H, Table 8-1.

(c) Ambient measurements taken by Landau staff on December 21, 2021. See Figure 1.

(d) Sound Transit WSBLE DEIS Appendix N.3, Attachment N.3H, Table 8-2. For DJ2, Audio Edit 1, Production A, Video Edit 1 and 2, Control Room and Video Control Room, predicted levels are based on impacts at spaces with similar setbacks within KEXP.

(e) Increase based on DEIS predicted noise levels over Landau-measured ambient noise levels.

(f) DEIS noise limit is incorrect for Production 1 and 2. Should be 25 dBA based on use as recording spaces.

To further illustrate the results in Table 5, the Ongoing Light Rail Operational Groundborne Noise figure on p. 8 of the KEXP Presentation (Attachment 1) provides a noise “heat map” that shows operational noise impacts by room within KEXP, based on predicted DEIS operational noise over ambient levels measured by Landau.

Train Speed

As summarized in DEIS Appendix N.3, Table 6-13 (p. 6-51) and 6-14 (p. 6-53) light rail train speeds were assessed as part of the calculation of groundborne noise and vibration. It is noted that there are inconsistencies or potentially errors that warrant further clarification.

For preferred alternative DT-1, the train speed through the Seattle Center campus is assumed to be 45 mph at all receivers except at KEXP, where speeds would be 55 mph and at the Seattle Rep and

Vera, where it would be 30 mph. The DEIS does not provide an explanation for the discrepancy in rail speeds. It understood that rail speeds would slow when trains were arriving at the station and would increase when trains were departing. However, at KEXP DJ2, the nearest section of rail is at the station itself, where trains would be driving at slow speeds or stopped, and would not likely be traveling 55 mph. Additional clarification and analysis is needed to ensure that train speed calculations are correct, and that resulting operational groundborne noise impacts from rail operation are correct.

For the DT-2 alternative, the train speed through the Seattle Center campus is 45 mph at all receivers except at the KEXP DJ booth, where is identified at 30 mph. Although impacts are not expected at KEXP from DJ2, the discrepancy in train speeds suggests that additional analysis may be warranted to ensure that the effect of rail speed has been adequately addressed.

Chapter 6.4: Construction Vibration Impacts

WSBLE DEIS Appendix N.3, Table 6-25 (p. 6-65) summarizes vibration impacts from construction. Table 6-25 identifies a predicted supply train vibration level of 69 vibration decibels (VdB) at KEXP, with a limit of 64 VdB, an exceedance of vibration thresholds at KEXP by 4 VdB. Further, predicted vibration from operation of the supply train and cutterhead (69 VdB and 60 VdB, respectively) would exceed ambient vibration levels at each space within KEXP (see ambient vibration measurements made by Landau in Figure 2).

WSBLE DEIS Appendix N.3, Table 6-27 predicts groundborne noise impacts at KEXP during tunneling, both with the cutterhead and supply train. Predicted groundborne noise levels would reach 42 dBA with the supply train and 38 dBA during use of the cutterhead, representing increases over the 25-dBA groundborne noise limit of 17-dBA and 13-dBA, respectively.

Table 8 below summarizes predicted tunneling groundborne noise emissions at each space within KEXP and compares these predictions with existing ambient conditions, as documented by Landau through noise measurements that were made in December 2021.

Table 6. KEXP Tunneling Groundborne Noise Increases of Existing Ambient Noise Levels, DT-1

KEXP Room	Landau Ambient Noise Measurement (a)	DT-1 Tunneling – Cutterhead		DT-1 Tunneling – Supply Train	
		Noise Level (dBA) (b)	Increase Over Existing Ambient (dBA)	Noise Level (dBA) (b)	Increase Over Existing Ambient (dBA)
DJ 1	38	38	0	42	4
DJ 2	37	38	1	42	5
Audio Edit 1	28	38	10	42	14
Audio Edit 2	30	38	8	42	12
Production 1	27	38	11	42	15
Production 2	27	38	11	42	15
Video Edit 1	25	38	13	42	17
Video Edit 2	24	38	14	42	18
Control Room	36	38	2	42	6
Live Room	28	38	10	42	14
Video Control Room	43	38	0	42	0

(a) Ambient measurements taken by Landau staff on December 21, 2021. See Figure 1.

(b) Sound Transit WSBLE DEIS Appendix N.3, Table 6-27.

As summarized in Table 6, predicted groundborne noise levels from tunneling, including from the cutterhead and supply train, were compared to existing ambient sound levels. The results suggest high levels of impact at most spaces within KEXP for DT-1. The biggest impacts to KEXP recording spaces are at Production 1 and 2, where groundborne tunneling noise is predicted to be up to 11 dBA over ambient conditions during construction with the cutterhead, and 15 dBA over ambient conditions during use of the supply train. Similar increases would occur at Audio Edit 1. Increases at this level would be clearly audible and discernible and may inhibit use of KEXP's audio recording facilities with low-frequency "rumbling" noise.

Mitigation is addressed later in this letter report, including the effectiveness of rubber tires on supply train vehicles. However, it is worth noting here that mitigation of supply train vehicles is strongly recommended to minimize potential for impact to KEXP. That is, that rubber tires should be required for the supply trains during tunneling given the high levels of groundborne noise anticipated at KEXP and the long duration of tunneling activity (multiple years).

To further illustrate the results in Table 6, the Tunneling Groundborne Noise figure on p. 7 of the KEXP Presentation (Attachment 1) provides a noise "heat map" that shows tunneling groundborne noise

impacts by room within KEXP, based on predicted DEIS operational noise over ambient levels measured by Landau.

Tunneling Equipment

WSBLE DEIS Appendix N.3, Section 6.4.1.2 and Table 6-26 (p. 6-66) identify equipment that would generate the highest levels of vibration during tunneling, including the boring machine cutterhead, thrust-jack retraction, and supply trains with steel wheels and jointed tracks.

In the footnote of Table 6-27 (p. 6-67), the WSBLE DEIS states, "The predicted levels for the thrust-jack are more than 5 dB below the impact threshold for all sensitive receivers." Groundborne noise predictions for thrust jack retraction are not provided in the WSBLE DEIS. However, Table 6-26 (p. 6-66) provides a range of sound levels of 13 to 29 dBA, as measured between 0 and 200 feet from thrust-jack operation. The range in sound levels for supply trains with steel wheels and jointed tracks is 24 to 28 dBA. While the median level of groundborne noise for supply trains is clearly higher than for thrust jack retraction, there is a potential for thrust jack retraction to generate groundborne noise levels that are as high as supply trains, according to the data provided in Table 6-26. The potential for groundborne noise impact is further increased when the limits for KEXP are adjusted (i.e., lowered).

A more detailed assessment should be conducted that further evaluates the potential for groundborne noise and vibration impact from thrust jack retraction.

Chapter 6.4.2. Surface Construction Vibration Impacts

WSBLE DEIS Appendix N.3, Table 6-29, p. 6-70, identifies distances for impact to Special Buildings during surface construction. The minimum distance for the least sensitive spaces (i.e., Vibration Criteria A, or V.C.-A) is greater than would be realized at KEXP for the equipment identified in this table. For example, the minimum distance for potential impact from a bulldozer under the V.C.-A curve is 125 feet, and the nearest distance to Special Buildings located near surface construction areas (i.e., KEXP) is 8 feet, as documented in Table 6-29.

WSBLE DEIS Appendix N.3, Chapter 6.4.2.2, p. 6-70 states that "surface construction vibration has not been assessed for Category 1 or special-use buildings near tunnel alignments. However, vibration from surface construction may be of concern if these buildings are close to the tunnel portals or station construction. These activities should be assessed in the Construction Vibration Control Plan."

Given the degree of impact that may occur from surface vibration during construction (see WSBLE DEIS Appendix N.3, Tables 6-29 and 6-30) and given the need to understand if effective mitigation of these impacts is feasible, a more detailed assessment of potential impacts and proposed mitigation should be included in a supplemental DEIS study, in lieu of requiring future assessments only through a control plan. Specifically, for cut-and-cover station excavation, in addition to the potential for usage impacts to tenants of the Northwest Rooms, an additional assessment should be completed that evaluates the potential for structural damage to the KEXP building.

Slurry Wall Demolition

The south wall of the DT-1 station design includes a diagonal portion that would extend underneath the Northwest Rooms, including underneath most of northern side of the KEXP building. A profile view of the station is provided on WSBLE DEIS Appendix J, Drawing B11-ASX102. Landau understands, through ongoing workshops hosted by Sound Transit during the WSBLE DEIS review period, that the southern wall of the DT-1 station would be constructed first as a vertical slurry wall, and then widened below grade toward the south to provide sufficient width for a station platform. Further, Landau understands that construction methods to expand the station footprint include breaking large portions of the slurry wall with a hoe ram. An illustration of how this construction activity may occur is provided in figures from the KEXP Presentation [Section A – Slurry Wall Demo (p. 4) and Perspective – Slurry Wall Demo (p. 5); Attachment 1].

The WSBLE DEIS does not include a review of impacts that are specific to the breaking of the slurry wall. However, demolition of this wall would occur very near Seattle Center resident organizations, including KEXP. It is anticipated that high levels of vibration would be emitted during use of the hoe ram, and impacts from this activity were not considered or included in the DEIS. Given the likely lengthy construction schedule (up to a year or more), there is a high potential for substantial impacts to KEXP during this phase of construction.

In addition to the use of a hoe ram, excavation of materials behind the slurry wall and directly underneath KEXP may result in additional vibration and groundborne noise impacts to multiple spaces within this facility.

Chapter 7: Noise and Vibration Mitigation Measures

Chapter 7.2: Construction Noise Mitigation

DEIS Appendix N.3, Chapter 7.2 (p. 7-16) identifies standard mitigation measures for construction noise. The following summarizes mitigation measures that were not included but should be considered:

General Construction Equipment

Loud construction equipment operating within the cut-and-cover construction area could operate as near as 8 feet from the KEXP building. As summarized above, estimated sound levels at the KEXP building could reach 104 dBA, and accounting for measured 61 dBA transmission loss through the building, could reach up to 43 dBA at interior spaces, potentially impacting recording operations within KEXP.

Mitigation measures summarized in the DEIS are effective strategies to reduce construction noise but do not specifically target the KEXP building and the potential for impacts therein.

Mitigation measures could include administrative controls, scheduling the noisiest activities during times that would be less likely to interfere with KEXP operations, including interior operations and outdoor performances within the Northwest Plaza. In addition, a noise barrier should be installed along the north wall of KEXP to provide additional shielding from construction equipment. A well-placed barrier of sufficient density (mass) and tall enough to break line-of-sight between the KEXP building and Northwest Plaza and construction equipment, could be effective at reducing noise emissions by 5 to 10 dBA or more. While this would not remove entirely the potential for impact at KEXP, it could reduce the degree of impact, especially if implemented in conjunction with other mitigation measures. Noise barriers should be required as part of the project's Construction Noise Control Plan.

Tunnel Ventilation Fans

Ventilation fans will be required to provide fresh air to crew within the tunnel and could operate 24-hours per day. The location of the fans is not yet defined but could be located very near to KEXP, including adjacent to the north wall, near noise-sensitive recording spaces. Due to the low-frequency noise generated by such fans, mitigation may be required to ensure fan noise at KEXP does not result in impacts to interior recording spaces or during outdoor performances at the Northwest Plaza.

Potential mitigation measures could include quieter fan models, strategic placement of fans, silencers, barriers, or other measures. Further, the EIS should include specific language within the Construction Noise Control Plan regarding exhaust fan noise.

Haul Trucks

Noise from idling and movement of haul trucks during construction, as well as noises from driving over uneven or unsecured surfaces, may result in impacts at noise-sensitive recording spaces within KEXP. Haul truck routes are not yet defined; however, an assessment should be completed to determine if mitigation of noise from haul trucks is warranted.

Further, the FEIS should include specific language within the Construction Noise and Vibration Control Plan regarding permitted haul routes that minimize the potential for impact to KEXP.

Staging Areas

Mitigation of staging area noise should be included in an updated noise impact assessment. Mitigation measures could include the strategic location of staging areas to minimize noise impacts, noise barriers, and other measures as defined in WSBLE DEIS Appendix N.3, Chapter 7.

Chapter 7.3: Operational Vibration Mitigation

Operational groundborne noise impacts are predicted at KEXP to be 32 dBA, 7 dBA over the limit at noise-sensitive recording spaces (see DEIS Appendix N.3, Attachment N.3H, Table 8-2, p. 8-21). DEIS Appendix N.3, Chapter 7.3.2.2 (p. 7-26) provides DT-1 operational groundborne noise and vibration

mitigation measures that would mitigate impacts at "recording studios and performances spaces in Seattle Center" (Chapter 7.3.2.2., p. 7-26). Included are high-resilience fasteners along 900 feet of new track between construction alignment stations 79+00 and 88+00.

The FTA 2018 Design Manual, in Table 6-11 (p. 140) states that high-resilience fasteners can achieve 5 dB of reduction in groundborne noise from tracks at frequencies above 40 hertz(Hz). As stated in DEIS Appendix N.3, Attachment N.3H, Chapter 8.4, p. 8-20, "Because Sound Transit expects at least 5 decibels of reduction from the tunnel structure that is not included in the prediction model, no additional mitigation measures beyond high-resilience fasteners are proposed."

If the above-noted Sound Transit expectation is true, groundborne noise impacts from tunnel operation would be mitigated. However, without additional predictive modeling to confirm, there is not clear evidence provided in the DEIS that supports Sound Tpreransit's position. Quantitative assessment of proposed mitigation suggests that groundborne noise impacts would likely occur at KEXP even with high-resilience fasteners. Therefore, additional assessment is needed to confirm that operational groundborne noise impacts would not occur at KEXP with the use of high-resilience fasteners and additional mitigation provided by the tunnel structure.

Chapter 7.4: Construction Vibration Mitigation

Chapter 7.4.1: Potential Surface Construction Vibration Mitigation

DEIS Appendix N.3, Chapter 7.4.1 (p. 7-31) identifies surface vibration mitigation measures that include pre-construction surveys, construction timing, equipment locations, continuous vibration monitoring, and alternative construction methods. The following summarizes mitigation measures that are not included.

Construction Vibration Control Plan

As noted in Chapter 6.4.2.2 (p. 6-70) of the WSBLE DEIS Appendix N.3, "surface construction vibration has not been assessed for Category 1 or special-use buildings near tunnel alignments, However, vibration from surface construction may be of concern if these buildings are close to the tunnel portals or station construction. These activities should be assessed in the Construction Vibration Control Plan."

Construction vibration measures should be updated once a more detailed assessment of surface vibration measures is completed, to support a Construction Vibration Control Plan. Given the high potential for surface vibration impact during construction, mitigation of surface vibration will be critical to KEXP.

Slurry Wall Demolition

As indicated, the DEIS does not include detailed assessment of the potential for vibration impacts from demolition of the slurry wall underneath KEXP. It is expected that both vibration and

groundborne noise impacts would occur at KEXP as a result of the slurry wall demolition, and therefore mitigation measures should be clearly evaluated and provided in the Construction Vibration Control Plan.

Chapter 7.4.2: Potential Tunneling Vibration Mitigation

DEIS Appendix N.3, Chapter 7.4.2 (p. 7-32) identifies mitigation measures to reduce the potential for vibration and groundborne noise impact during tunneling. The following summarize key elements of this review.

Supply Train

Details provided in WSBLE DEIS Appendix N.3, Chapter 7.4.2 are focused on mitigating vibration from the supply train, including reduced supply train speeds, smooth running surfaces, reduced gaps between rail sections, adding rubber pads between ties, and using rubber tires on supply trains. Specifically, WSBLE DEIS Appendix N.3, Chapter 7.4.2, p. 7-32 suggests that rubber tires on supply trains could provide effective mitigation of vibration and groundborne noise at frequencies above 10 Hz.

As noted in WSBLE DEIS Appendix N.3, Table 6-27 (p. 6-67), groundborne noise from unmitigated supply trains could result in noise levels inside KEXP that are up to 42 dBA, exceeding the 25-dBA recording studio noise limit by 17 dBA. Mitigation of noise from supply trains in the vicinity of KEXP is warranted.

Given the high level of impact that may occur due to the supply trains at multiple noise-sensitive Seattle Center facilities and resident organizations, and that predictive modeling has not been completed to fully evaluate the mitigating effect of rubber tires on supply trains, the Construction Vibration Control Plan should be supported by a detailed assessment of rubber tires on supply trains, including an assessment of impacts and mitigation effectiveness at KEXP. The assessment should evaluate whether impacts to each of the spaces within KEXP are effectively mitigated to below ambient levels.

Thrust Jack

As indicated, mitigation of vibration from thrust jacks may be warranted through slower retraction of the jacks. A mitigation assessment of thrust jacks should be completed once a more detailed assessment of the potential for impact from this activity is completed. If necessary, mitigation measures should be included in the Construction Vibration Control Plan.

Cutterhead

As stated in WSBLE DEIS Appendix N.3, Chapter 7.4.2, p. 7-32, it is not possible to mitigate vibration from the tunneling cutterhead. However, as stated, mitigation can be achieved through vibration monitoring and coordination with Category 1 and special use buildings (i.e., KEXP). The Construction

Vibration Control Plan should specify locations to be monitored at KEXP, including the number of monitors and duration of monitoring, as well as the established thresholds above which action is taken. Also, the Plan should include clear direction for the General Contractor to coordinate with KEXP so that noise-sensitive events can be schedule accordingly.

* * * * *

If you have you any questions or comments regarding the information provided in this letter report, please contact the undersigned.

LANDAU ASSOCIATES, INC.

Kevin Warner
Principal

Kristen Wallace
Principal

References

FTA. 2018. Transit Noise and Vibration Impact Assessment Manual. FTA Report No. 0123. Federal Transit Administration. September. https://www7.fta.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf.

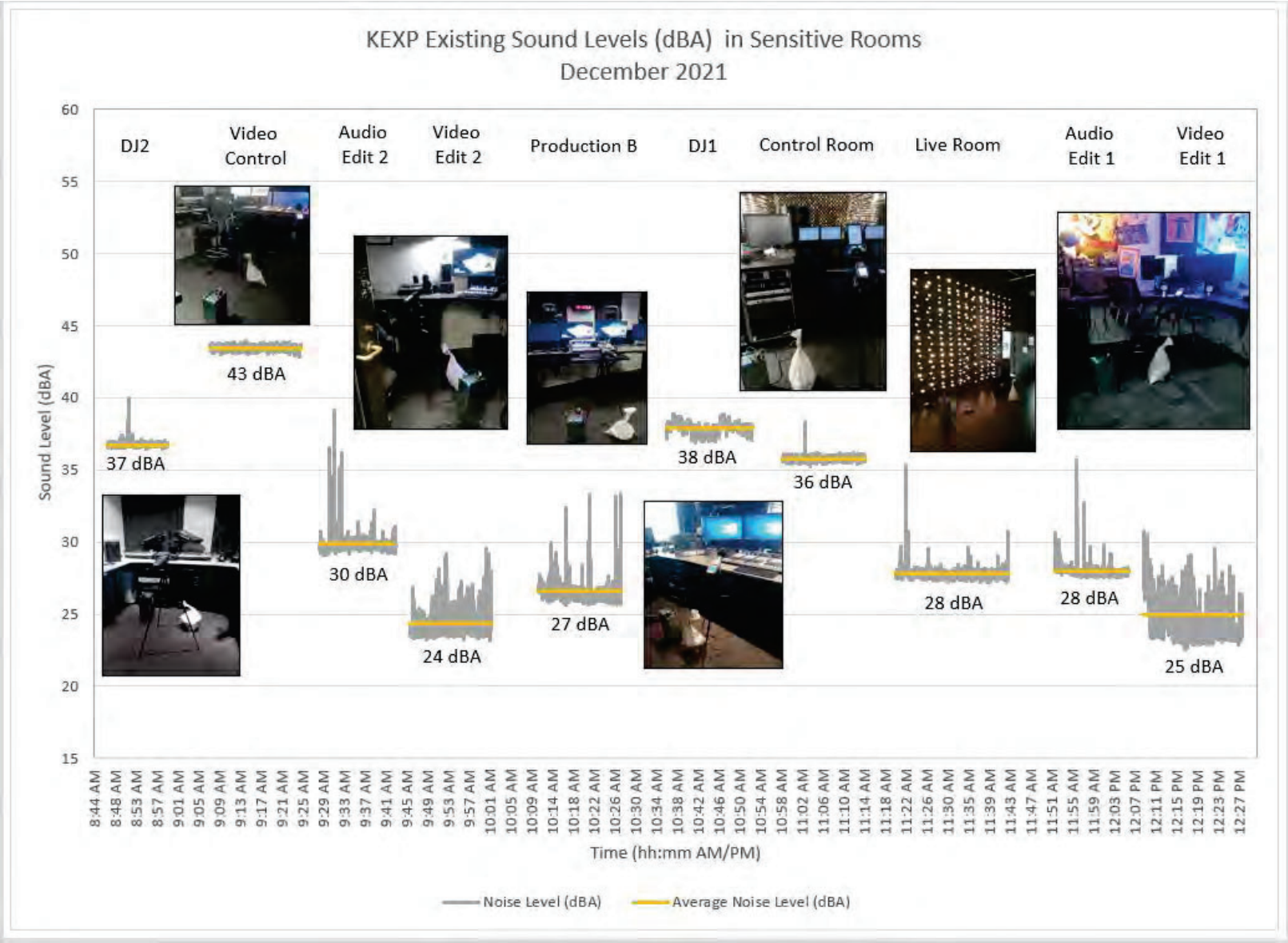
Sound Transit. 2021. Design Criteria Manual. Amendment 11 Revision 5. May. https://www.soundtransit.org/sites/default/files/documents/design-criteria-manual-may-2021.pdf.

USDOT, FTA, and Sound Transit. 2022a. West Seattle and Ballard Link Extensions Draft Environmental Impact Statement. US Department of Transportation, Federal Transit Administration, and Central Puget Sound Regional Transit Authority (Sound Transit). January. https://www.soundtransit.org/get-to-know-us/documents-reports/west-seattle-ballard-link-extensions-draft-environmental-impact-0.

USDOT, FTA, and Sound Transit. 2022b. West Seattle and Ballard Link Extensions Draft Environmental Impact Statement, Appendix N.3: Noise and Vibration Technical Report. US Department of Transportation, Federal Transit Administration, and Central Puget Sound Regional Transit Authority (Sound Transit). January. https://www.soundtransit.org/sites/default/files/documents/16a-wsble-drafteis-noisetechreport-202201.pdf.

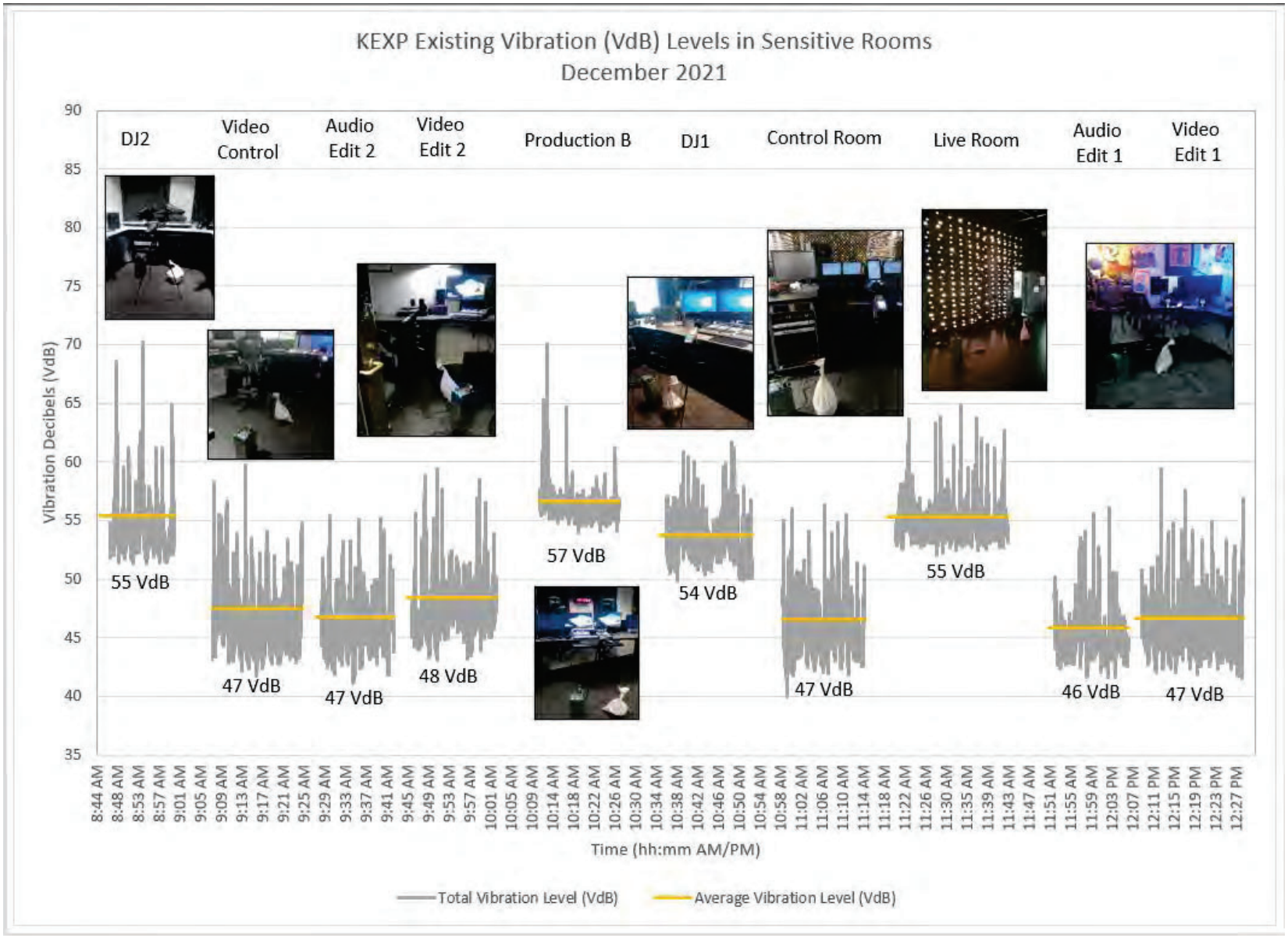
Attachments

Figure 1: Chart of Landau Ambient Noise Measurements at KEXP
Figure 2: Chart of Landau Ambient Vibration Measurements at KEXP
Attachment 1: KEXP Sound Transit Construction Impact, April 26, 2022



Sound Transit WSBLE DEIS KEXP Seattle, Washington	**Chart of Landau Ambient Noise Measurements at KEXP**	Figure 1

LANDAU ASSOCIATES

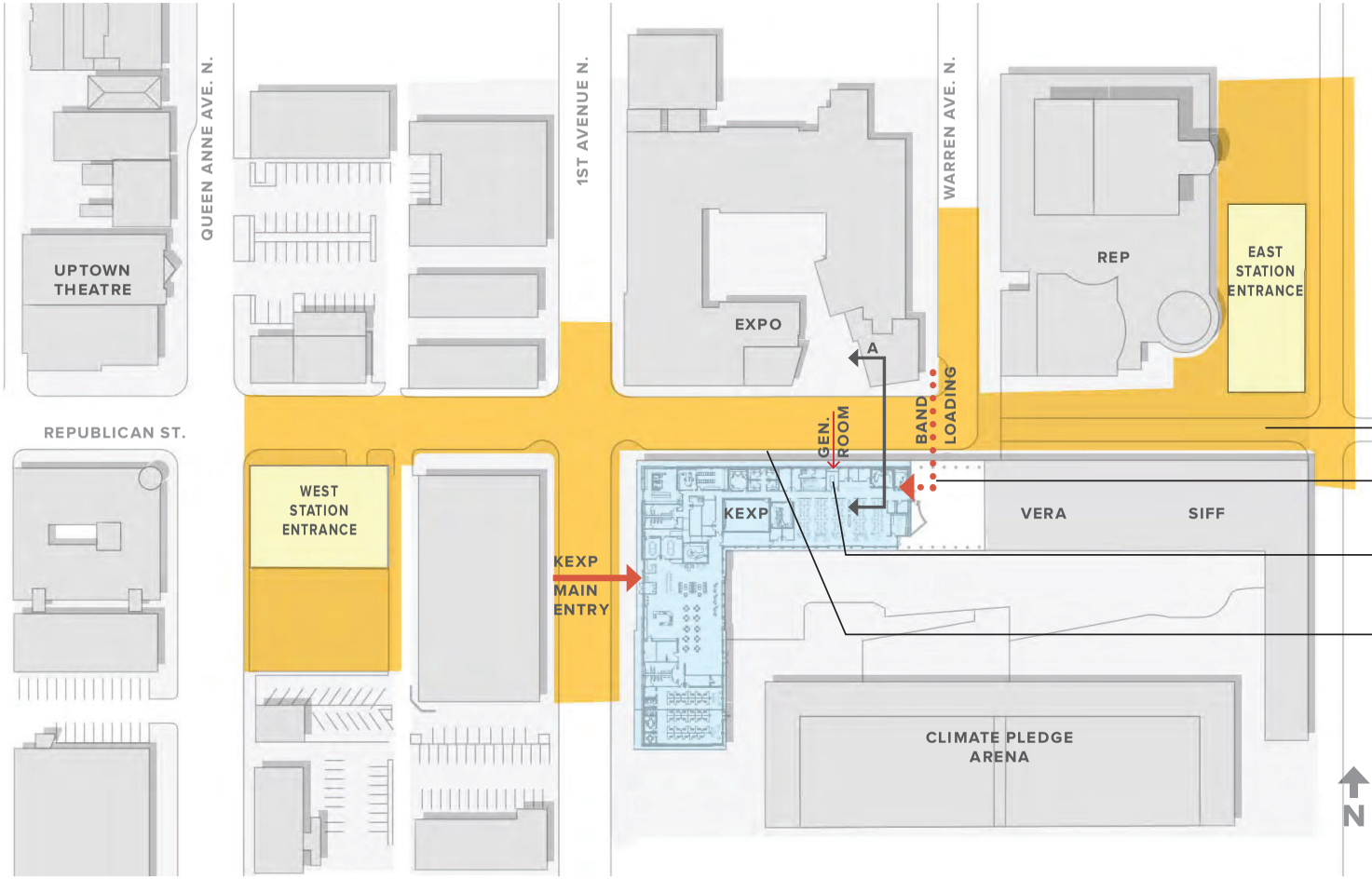


Sound Transit WSBLE DEIS KEXP Seattle, Washington	**Chart of Landau Ambient Vibration Measurements at KEXP**	Figure 2

LANDAU ASSOCIATES

Attachment 1

KEXP Sound Transit Construction Impact
April 26, 2022



CONSTRUCTION BARRIER EXAMPLE

CONSTRUCTION BARRIER EXAMPLE

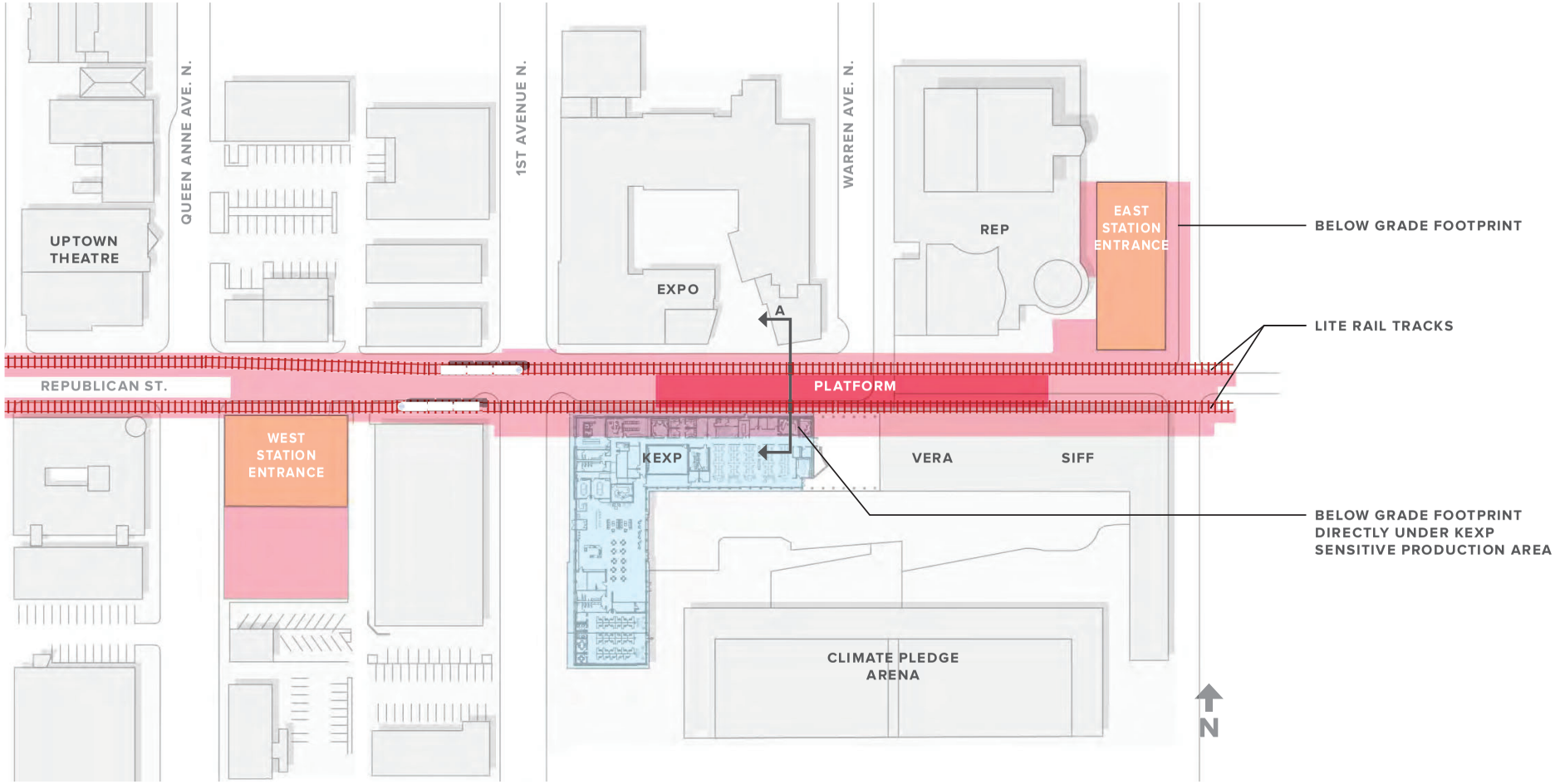
CONSTRUCTION AREA

BAND LOADING PATH
200x PER YEAR

GENERATOR ROOM - ACCESS APPROXIMATELY ON MONTHLY BASIS

SOUND BARRIER TO MITIGATE CONSTRUCTION NOISE IN FRONT OF KEXP, VERA, AND SIFF

STATION AREA CONSTRUCTION AND STAGING ZONE



STATION AREA BELOW GRADE

DISRUPTION STEPS

STEPS 1-4 CONSTRUCTION OF STATION ESTIMATED 2-4 YEARS

STEP 5 TUNNELING ESTIMATED 2-2.5 YEARS

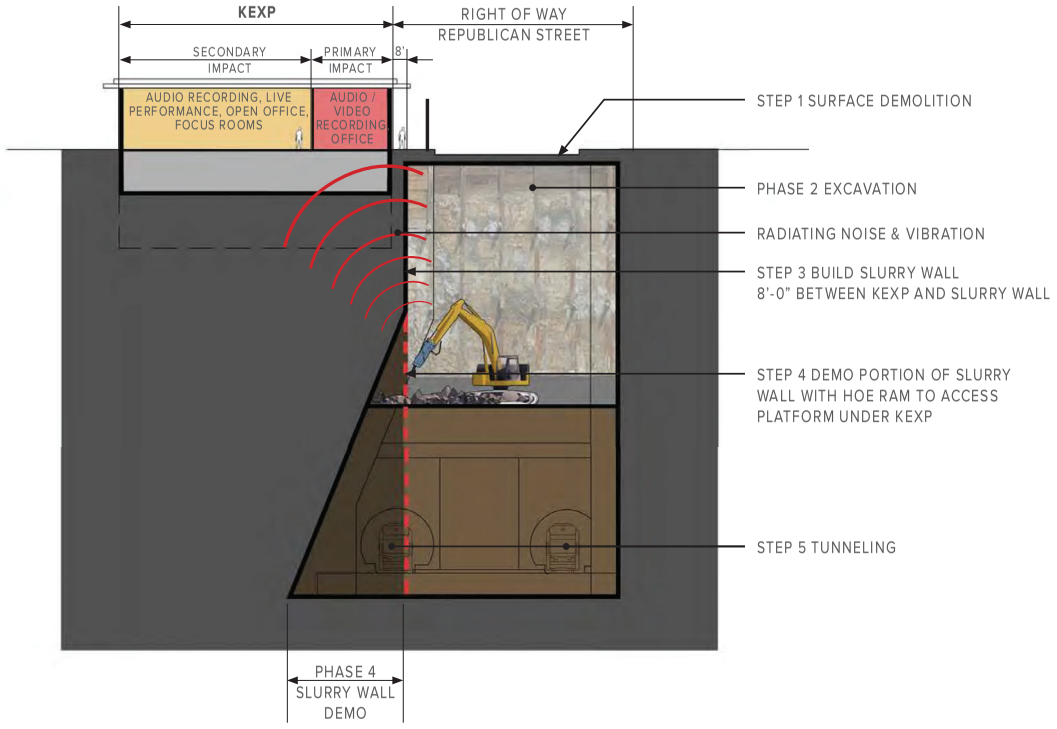
STEP 1: DEMOLITION

STEP 2: EXCAVATION

STEP 3: BUILD SLURRY WALL

STEP 4: DEMO PORTION OF SLURRY WALL BELOW KEXP

STEP 5: TUNNELING

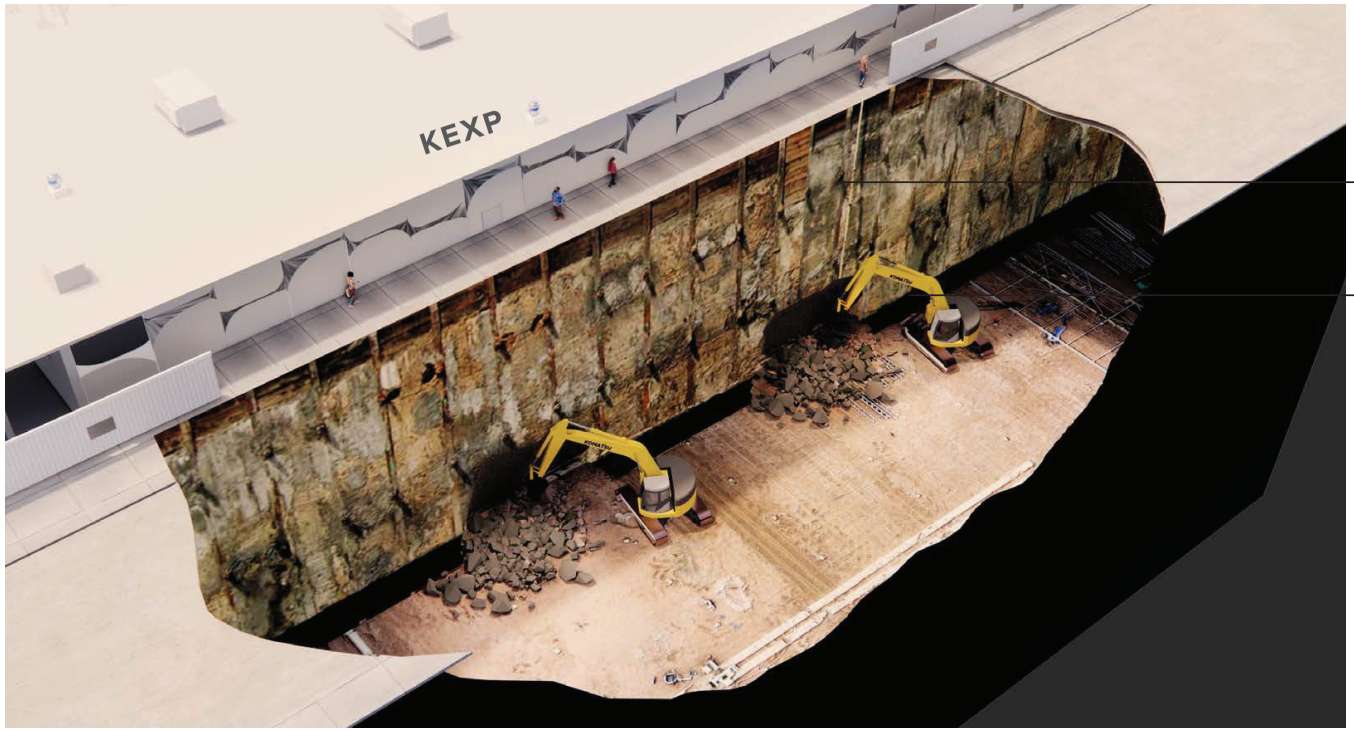


*CHAPTER 6.2.1.6 (6-33) NOTES WORST CASE NOISE LEVEL WILL BE 88 dBA AT 50' AWAY. KEXP IS 8' LOCATED FROM CONSTRUCTION AND AWAY AND ESTIMATED TO HAVE A NOISE LEVEL OF 104 dBA AT THE EXTERIOR OF KEXP.

SECTION A - SLURRY WALL DEMO

PHASE 4: DEMO PORTION OF SLURRY WALL BELOW KEXP

AFTER SLURRY WALL IS BUILT, DEMOLITION TO PORTION OF SLURRY WALL WILL OCCUR TO ACCESS AREA BELOW KEXP.

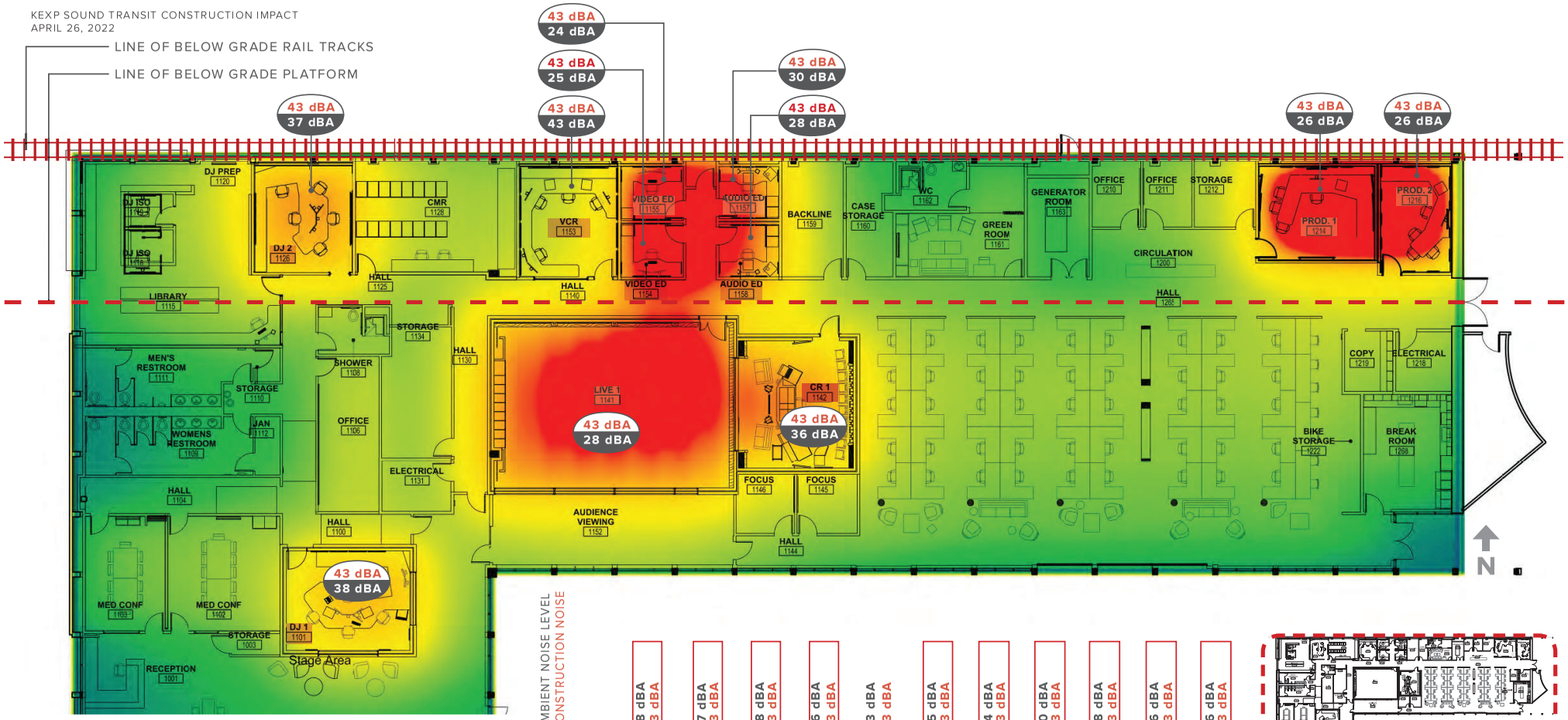


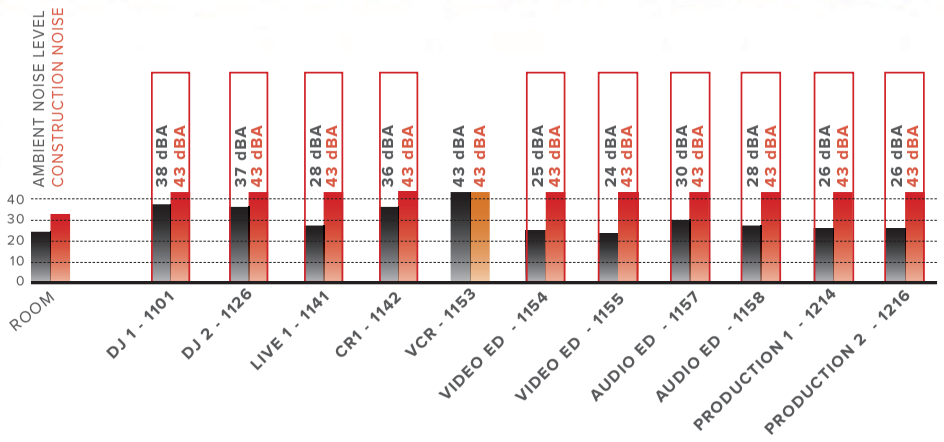
PERSPECTIVE - SLURRY WALL DEMO

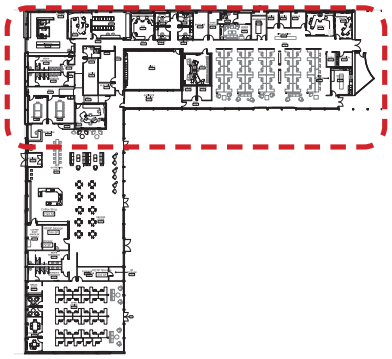
KEXP SOUND TRANSIT CONSTRUCTION IMPACT
APRIL 26, 2022

LINE OF BELOW GRADE RAIL TRACKS

LINE OF BELOW GRADE PLATFORM







KEY PLAN

32 dBA
25 dBA

PREDICTED GROUNDBORNE NOISE DURING CONSTRUCTION

AMBIENT NOISE LEVEL
Ambient noise numbers come from Landau's measurements in KEXP's space

LIVE 1
1141

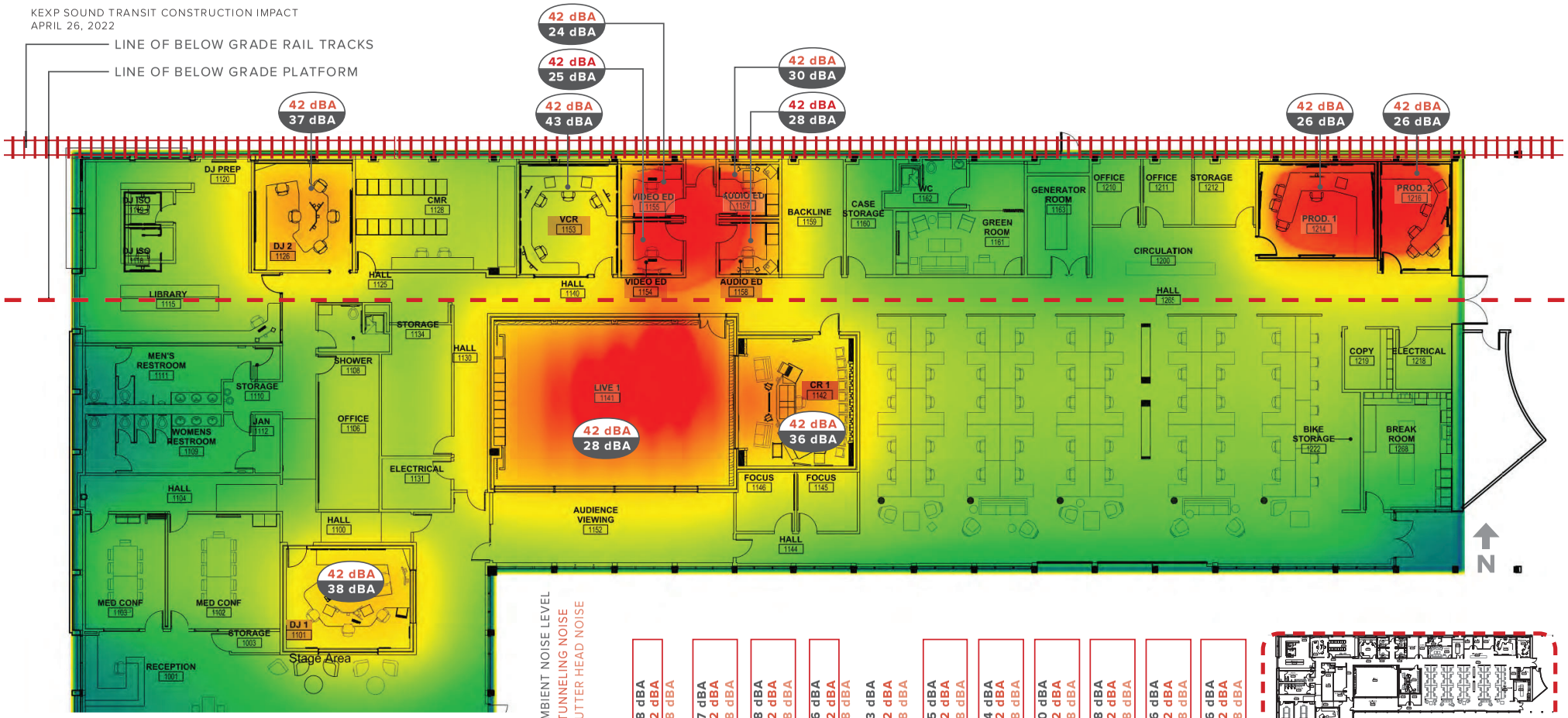
RECTANGLE DENOTES NOISE SENSITIVE SPACE

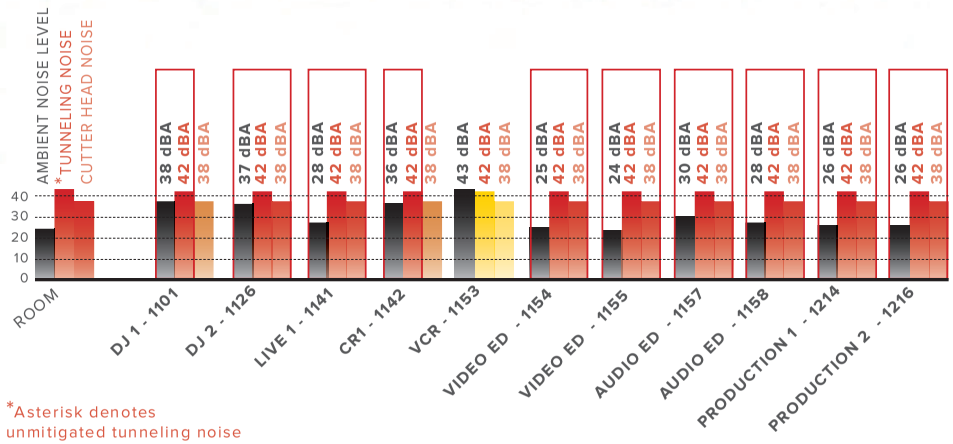
CONSTRUCTION NOISE - MULTIPLE YEARS

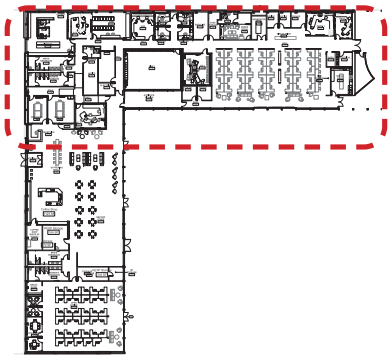
KEXP SOUND TRANSIT CONSTRUCTION IMPACT
APRIL 26, 2022

LINE OF BELOW GRADE RAIL TRACKS

LINE OF BELOW GRADE PLATFORM







KEY PLAN

PREDICTED TUNNELING GROUNDBORNE NOISE
(CUTTER HEAD NOISE SHOWN ON GRAPH ONLY)

32 dBA
25 dBA

AMBIENT NOISE LEVEL
Ambient noise numbers come from Landau's measurements in KEXP's space

LIVE 1
1141

RECTANGLE DENOTES NOISE SENSITIVE SPACE

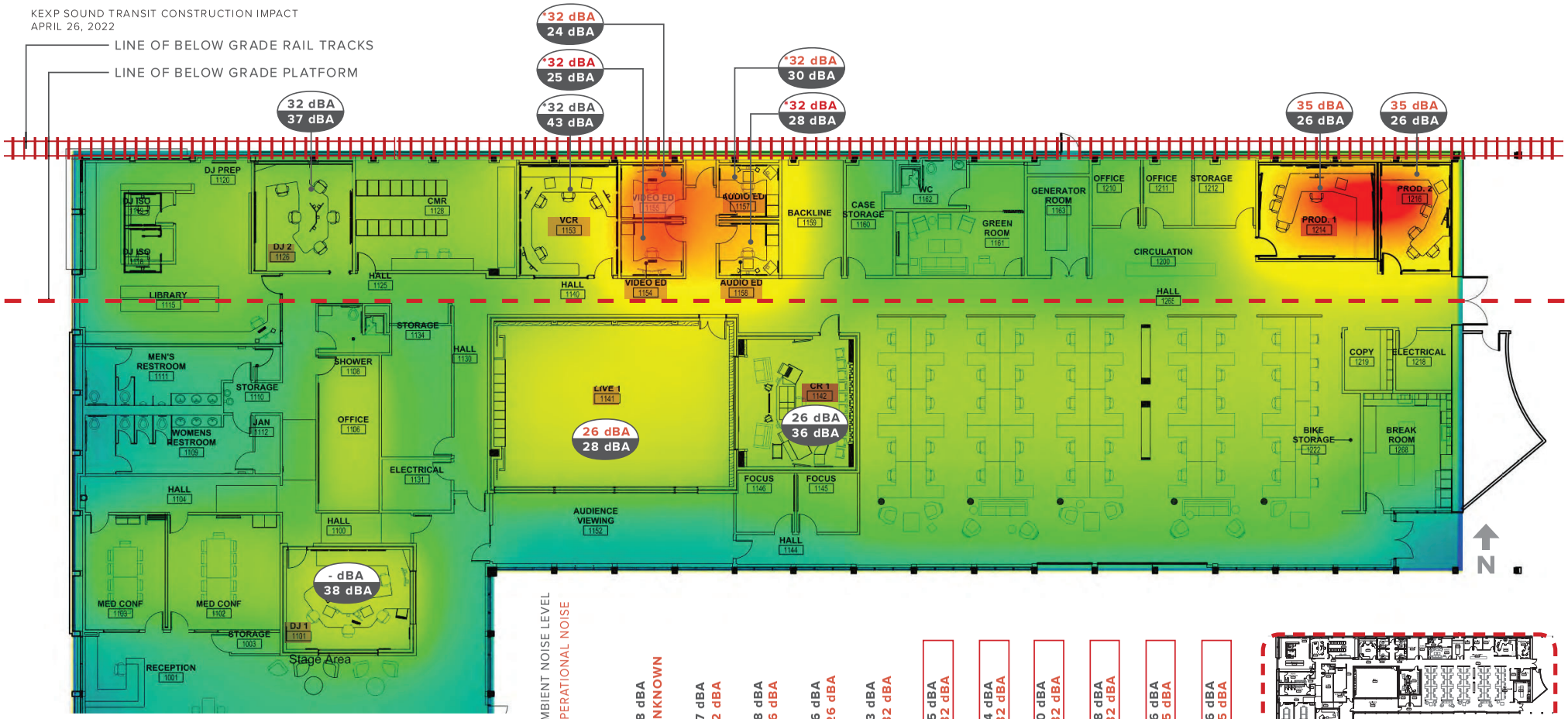
*Asterisk denotes unmitigated tunneling noise

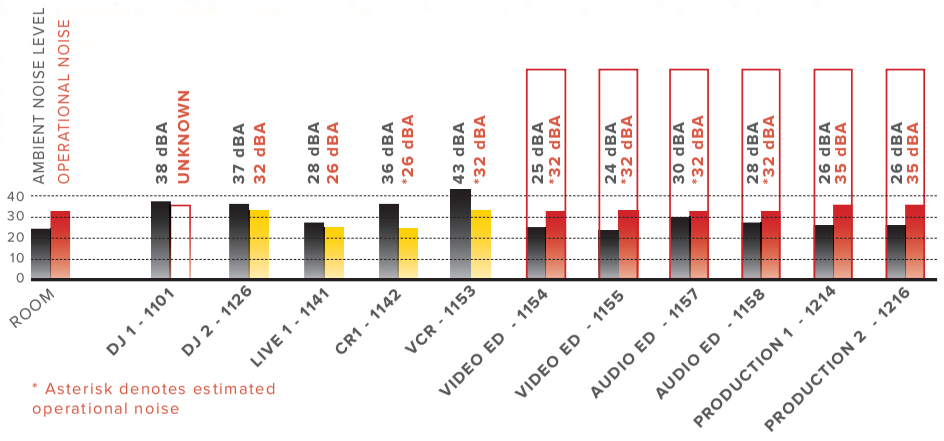
TUNNELING GROUNDBORNE NOISE

KEXP SOUND TRANSIT CONSTRUCTION IMPACT
APRIL 26, 2022

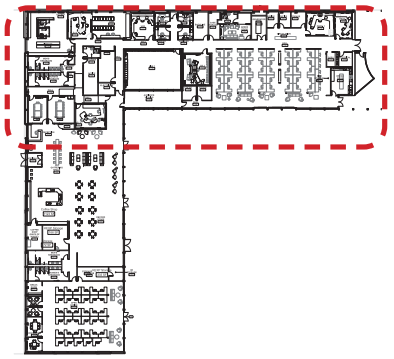
LINE OF BELOW GRADE RAIL TRACKS

LINE OF BELOW GRADE PLATFORM





* Asterisk denotes estimated operational noise



KEY PLAN

* ASTERISK WHERE OCCURS:
ASSUMED CONSTRUCTION NOISE
(INFO NOT PROVIDED BY CITY)

PREDICTED OPERATIONAL GROUNDBORNE LIGHT RAIL NOISE

*32 dBA 25 dBA

AMBIENT NOISE LEVEL
Ambient noise numbers come from Landau's measurements in KEXP's space

LIVE 1 1141

RECTANGLE DENOTES NOISE SENSITIVE SPACE

ONGOING LIGHT RAIL OPERATIONAL GROUNDBORNE NOISE

EXHIBIT B

April 26, 2022

Seattle Rep
P.O. Box 900923
155 Mercer Street
Seattle, WA 98109

Attn: Jeffrey Herrmann

Transmitted via email to: ***jeff.herrmann@seattlerep.org***

Re: Sound Transit WSBLE DEIS Review for Seattle Repertory Theater
Seattle, Washington
Landau Project No. 2063001.010

Dear Jeff:

At the request of Seattle Repertory Theatre (Seattle Rep), Landau Associates, Inc. (Landau) prepared this summary of our assessment of the noise and vibration sections of the Sound Transit West Seattle and Ballard Link Extensions (WSBLE) Draft Environmental Impact Statement (DEIS).

Seattle Rep is located at Seattle Center and contains two main theaters: the 696-seat Bagley Wright Theater and the 282-seat Leo Kreielsheimer (Leo K.) Theater. Seattle Rep also houses additional rehearsal spaces, including the Poncho Forum (also used for performances) and the Leo K. Theater rehearsal space, set, prop, paint, and costume shops, administrative offices, and extensive lobby areas for the general public.

Seattle Rep has retained Landau noise and vibration expert consultants to review the WSBLE DEIS and provide comment on the document's accuracy and completeness regarding assessment of noise and vibration impacts.

This letter report summarizes Landau's assessment of the WSBLE DEIS as it relates to the potential for noise and vibration impact to Seattle Rep, and includes a summary of findings, a list of documents that were reviewed, and a detailed review of selected chapters of the DEIS.

Summary

Landau finds the assumptions and methods used by Sound Transit to analyze noise and vibration impacts to be reasonably correct. However, Landau finds some elements of the WSBLE DEIS analysis to be incomplete and/or incorrect. These missing or incorrect analysis elements result in an incomplete assessment of noise and vibration impacts and mitigation. The key findings of this review include:

- City of Seattle (City) noise limits are not applied in the noise impact section when determining the potential for construction noise impacts and whether additional mitigation is warranted.

- Edits to the document are required to adjust noise and vibration limits for sensitive spaces within Seattle Rep; these adjustments will result in higher levels of impact at some sensitive receivers.
- There are missing receptors, including the Leo K. Rehearsal space and the Poncho Forum, which are sensitive spaces within Seattle Rep.
- The assessment of airborne noise impacts during construction is incomplete.
- An assessment of mitigation measures is required for expected airborne noise impacts at Seattle Rep.
- Additional assessments of groundborne noise and vibration impacts from construction are warranted to fully address potential impacts from both Downtown-1 (DT-1) and DT-2.
- Additional assessments of groundborne noise and vibration mitigation measures from construction are warranted to fully address impacts from both DT-1 and DT-2.
- The surface construction vibration impact and mitigation assessment is incomplete.
- Station construction methods for DT-1 include breaking a slurry wall with a hoe ram, a potential major source of groundborne noise and vibration that was not evaluated.
- East Station Entrances would be located immediately adjacent to Seattle Rep; groundborne noise, vibration, and surface noise impacts from construction are not fully evaluated.
- Operational groundborne noise impacts warrant additional mitigation for DT-1 beyond high-resilience fasteners and beyond the linear extents identified in the DEIS.

Review Documents

Landau reviewed the following documents in support of the assessment:

- Sound Transit and Federal Transit Administration's (FTA's) WSBLE DEIS, Chapter 4.2.7: Noise and Vibration (pp. 4.2.7-1 to 4.2.7-23) (USDOT et al. 2022a)
- Sound Transit and FTA's WSBLE DEIS, Appendix N.3: Noise and Vibration Technical Report (USDOT et al. 2022b)
- Sound Transit and FTA's WSBLE DEIS, Attachment N.3A: Noise Measurement Data, Site Details, and Photographs
- Sound Transit and FTA's WSBLE DEIS, Attachment N.3B: Vibration Measurement Site Photographs
- Sound Transit and FTA's WSBLE DEIS, Attachment N.3C: Vibration Propagation Measurement Results
- Sound Transit and FTA's WSBLE DEIS, Attachment N.3D: Maps of Noise Impact Assessment
- Sound Transit and FTA's WSBLE, Attachment N.3E: Maps of Vibration Impact Assessment
- Sound Transit and FTA's WSBLE DEIS, Attachment N.3F: Tables of Noise Predictions
- Sound Transit and FTA's WSBLE DEIS, Attachment N.3G: Tables of Vibration Predictions
- Sound Transit and FTA's WSBLE DEIS, Attachment N.3H: Vibration Analysis of Category 1 Land Uses and Special Buildings

- FTA's *Transit Noise and Vibration Impact Assessment Manual* (FTA Guidance Manual; FTA 2018)
- Sound Transit's Design Criteria Manual, Revision 5, Amendment 11 (Sound Transit 2021).

Review Format

Landau's assessment focused on chapters in the WSBLE DEIS that are relevant to the assessment of noise and vibration impacts from DT-1 and DT-2. Headings that begin with "Chapter" refer to the corresponding chapter in WSBLE DEIS Appendix N.3: Noise and Vibration Technical Report (USDOT et al. 2022b).

Chapter 3: Noise and Vibration Impact Criteria

The WSBLE DEIS applies the noise and vibration impact criteria established for transit projects according to the FTA Guidance Manual. Sound Transit is a public transit authority that receives federal funding to support its projects. Landau finds that the use of the FTA criteria is appropriate for the assessment of noise and vibration impacts from this project. However, as detailed below, the FTA noise and vibration limits that were applied to some sensitive receiving spaces were incorrect.

WSBLE DEIS Appendix N.3, Chapter 3.1.3 identifies the City noise criteria, as established in Chapter 25.08 of the Seattle Municipal Code (SMC). SMC noise limits are applicable during daytime and nighttime hours for various source and receiving "Districts." Further, SMC 25.08 includes sound level limits that apply specifically to construction. Landau finds the DEIS interpretation of the City's noise criteria to be correct.

Landau finds that the assessment does not identify impacts relative to the City's noise criteria. That is, the assessment is focused only on FTA criteria (that are applicable) and whether construction or operation would meet FTA criteria. The assessment refers to the required compliance with City construction noise limits in WSBLE DEIS Appendix N.3, Chapter 7, Construction Noise Mitigation (p. 7-16), but not when evaluating the potential for noise impacts throughout Seattle Center. Because City construction noise limits apply to this project, the noise assessment should consider whether construction noise is expected to meet these limits. If the project cannot meet these limits, sufficient noise mitigation measures should be required; otherwise, alternative construction methods should be explored.

Chapter 4: Noise and Vibration Impact Analysis Assumptions and Methods

WSBLE DEIS Appendix N.3, Chapter 4 summarizes the analysis assumptions and the methods for assessment of noise and vibration impacts. This chapter reviews multiple elements that are considered when predicting noise and vibration emissions from light rail projects and includes results of vibration propagation testing and discusses noise and vibration measurements made by Sound

Transit to support the noise and vibration impact assessment. Landau finds the impact analysis assumptions and methods to be reasonably correct.

Chapter 6: Impact Assessment

The following summarizes Landau's review of the WSBLE DEIS impact assessment of DT-1 and DT-2, including airborne noise from construction and groundborne noise and vibration from construction and operation, as received at Seattle Rep. Figure 1, a map of Seattle Rep within the Seattle Center campus, illustrates the locations of DT-1 and DT-2, including rail alignments, stations, and station entrances, as well as nearby Seattle Center resident organizations, facilities, and outdoor areas.

Noise and Vibration Limits

WSBLE DEIS Appendix N.3, Chapter 6.4 (p. 6-63) indicates that noise and vibration from construction, including tunneling (cutterhead and supply train) and surface construction were compared to the same FTA operational noise limits "because this can be a relatively long-term activity." Landau agrees with this determination and notes that the noise limits in WSBLE DEIS Appendix N.3 contain errors and omissions for spaces within Seattle Rep. Table 1 summarizes the noise and vibration limits applied for each space, highlighting the errors that require correction or further assessment. The list of noise and vibration limits for Seattle Rep sensitive spaces was compiled from WSBLE DEIS Appendix N.3, Attachment N.3H, Tables 7-2 and 7-3.

Noise and Vibration Limits – Corrections

WSBLE DEIS Appendix N.3, Section 6.3, Tables 6-13 and 6-14 identify operational groundborne noise and vibration limits for DT-1 and DT-2, respectively. For Seattle Rep, the operational groundborne noise and vibration limits were expanded to consider different rooms within the facility as shown in Tables 7-2 and 7-3 in WSBLE DEIS Appendix N.3, Attachment N.3H. For example, in Table 6-13 Seattle Rep is identified as "Seattle Repertory Leo K. Theatre." In Attachment N.3H, Table 7-2, Seattle Rep spaces include the Leo K. and the Bagley Wright Theaters.

Landau notes that adjustments to some Seattle Rep noise limits, as documented in the DEIS, are warranted following measurements by Landau staff and review of the noise- and vibration-sensitive nature of selected spaces. That is, for many spaces within Seattle Rep, a quiet environment is germane to their use. Noise intrusion, such as low-frequency groundborne noise "rumbling" from nearby surface construction, tunneling, and rail operations, may negatively affect Seattle Rep's use and audience experience. Vibration impacts, even at low levels, can affect the stability of Seattle Rep's suspended lighting systems (i.e., vibrations may cause suspending lighting systems to sway).

A summary of the recommended adjustments to the groundborne noise and vibration limits, including a justification for the adjustment, is provided below in Table 1. Additional detail is provided in the text after this table. Graphical illustrations of noise and vibration measurements made at spaces within Seattle Rep are provided on Figures 2 and 3, respectively.

Table 1: Summary of Noise and Vibration Limit Corrections

Resident Organization	Limits for Operation and Construction (a)		Corrections (Source of Adjusted Limits) (b)		Notes Justification for Adjusted Limits
	Noise (dBA)	Vibration (VdB)	Noise (dBA)	Vibration (VdB)	
Seattle Rep Bagley Wright Theater	35	72	--	65 VdB	Vibration limit is appropriate for "Concert Hall" per FTA Guidance Manual. DEIS noise limit appropriate, confirmed through DEIS and Landau measurements
Seattle Rep Leo K. Theater	35	72	25 dBA	65 VdB	Noise and vibration limits are appropriate for "Concert Hall" per FTA Guidance Manual, confirmed through Landau measurements

(a) Sound Transit WSBLE DEIS Appendix N.3, Attachment N.3H, Tables 7-2 and 7-3.

(b) Based on measurements made by Landau staff for Seattle Rep in early 2022.

dBA = A-weighted decibels

VdB = vibration decibels

Measurements at the Leo K. Theater by Landau staff in January 2022 suggest that a more appropriate limit is 25 dBA, aligning with FTA criteria for a "Concert Hall." Although the measurement made for the DEIS and documented in WSBLE DEIS Appendix N.3, Attachment N.3H, Table 7-1 (p. 7-3) was 30 dBA for the Leo K. Theater (which is still 5 dBA lower than what was applied in Tables 6-13 and 6-14), the average ambient measurement by Landau was 26 dBA (see Figure 5) and align with the suggested adjustment to a limit of 25 dBA. Further, Landau notes that Seattle Rep's experience during construction of the Climate Pledge Arena indicates that the Leo K. Theater is highly sensitive to groundborne noise intrusion due to the very low ambient noise levels within the theater and the sensitive use of this space (i.e., unamplified performances).

Similarly, the vibration limit at Seattle Rep is identified as 72 VdB in DEIS Attachment N.3, Tables 6-13 and 6-14. A more appropriate limit for Seattle Rep, including both the Leo K. and Bagley Wright Theaters, is 65 VdB, which also aligns with FTA criteria for a "Concert Hall." In addition to groundborne noise impacts during construction of the Climate Pledge Arena, vibration impacts from this same construction resulted in movement (i.e., swaying) of lighting systems. An adjusted and more stringent vibration limit should apply to the Leo K. and Bagley Wright Theaters, reducing the potential for vibration impacts and stabilizing the lighting systems on these stages.

Noise and Vibration – Missing Sensitive Receivers

WSBLE DEIS Appendix N.3 omits two noise-sensitive spaces within Seattle Rep that should be included in the assessment of impacts from the WSBLE project: the Leo K. Rehearsal Space and the Poncho Forum. The Leo K. Rehearsal Space is regularly used for rehearsals. Performers rehearsing in this space require an ambient environment that is similar to what would be experienced during a live

performance in the Leo K. Theater. That is, it is expected that ambient noise and vibration levels would be low, and that interference from sources exterior to Seattle Rep would be minimal.

The Poncho Forum is used as both a rehearsal space and performance space, with retractable seating for audiences. The room is fitted with acoustic paneling to minimize reverberation of sounds. Similar to the Leo K. Rehearsal Space, use of the Poncho Forum requires that ambient noise and vibration levels are low to minimize disturbances to performers as well as the audience (when applicable).

Table 2 below summarizes proposed noise and vibration limits for these additional spaces, based on measurements and Landau's understanding of their uses. Included on Figure 5 are graphical illustrations of average measurements made in these spaces. Note that Table 2 also includes a summary of potential sources of noise and vibration impact that are anticipated in the Leo K. Rehearsal Space and Poncho Forum from DT-1 or DT-2.

Table 2: DEIS Appendix N.3 – Missing Seattle Center Noise- and Vibration-Sensitive Receivers

Resident Organization Buildings	Suggested Noise and Vibration Limits (a)		Summary of Use	Potential Source(s) of Noise or Vibration Impact (b)
	Noise (dBA)	Vibration (VdB)		
Seattle Rep Leo K. Rehearsal Space	30	65	Rehearsal space for Leo K. Theater; quiet is germane to use	DT-1 and DT-2 surface construction and tunneling; DT-1 and DT-2 operation
Seattle Rep Poncho Forum	30	72	Rehearsal and performance space; quiet is germane to use	DT-1 and DT-2 surface construction and tunneling; DT-1 and DT-2 operation

(a) Suggested limits appropriate for use of space and sensitivities to noise and vibration. Based on measurements by Landau and discussions with Seattle Rep.

(b) Potential for impact may be due to activities identified in this table and may also include activities not identified here. A complete assessment is required.

Chapter 6.2: Construction Noise Impacts

The construction noise impact assessment (i.e., airborne noise) was completed using the methods described in the FTA Guidance Manual. WSLBE DEIS Chapter 2.6, Table 2-6, Major Construction Activities and Duration, provides estimated durations for various construction activities related to WSBLE. Cut-and-cover station construction is estimated to take 4 to 6 years to complete. Therefore, the following review of construction noise impacts applies to a construction schedule that could last up to 6 years. Landau notes that construction noise levels will vary and likely decrease as construction progresses. However, the duration of time required for each element of cut-and-cover station construction (e.g., demolition, excavation, shoring, structural, etc.) is unknown.

Chapters 6.2.1.5 (Tunneling) and 6.2.1.6 (Cut-and-Cover)

WSBLE DEIS Appendix N.3, Chapter 6.2.1.5 summarizes surface-level construction noise that would occur in support of tunneling operations; WSBLE DEIS Appendix N.3, Chapter 6.2.1.6 summarizes surface-level construction noise that would occur in support of cut-and-cover station construction.

As identified in WSBLE DEIS Appendix N.3, Table 6-30, the location of the cut-and-cover construction area could be as near as 8 feet from Seattle Rep under either alternative DT-1 or DT-2. WSBLE DEIS Appendix J, Drawing L50-GSP103, provides an illustration of the DT-1 Seattle Center station and entrances. Upon review of this drawing, Landau notes that DT-1 surface construction near Seattle Rep would impact the south side of the building during cut-and-cover and station construction, the east side of the building during construction of the East Station Entrance, and the west side of the building during construction activities along Warren Avenue North just north of the DT-1 station.

WSBLE Appendix J, Drawing L50-GSP703 provides an illustration of the DT-2 Seattle Center station and entrances. Upon review of this drawing, Landau notes that DT-2 surface construction near Seattle Rep would impact the west side of the building during construction of the East Station Entrance as well as during cut-and-cover and station construction. Additional noise is likely to be received from construction activities along Warren Avenue North just south of Mercer Street.

WSBLE DEIS Appendix N.3, Chapter 6.2.1.5 identifies the use of excavators and backhoes for portal and shaft excavation, and trucks and loaders for transporting spoils. In addition, WSBLE DEIS Appendix N.3, Chapter 6.2.1.5 identifies ventilation fans that "would likely run continuously to provide fresh air to construction crews working inside the tunnel." For cut-and-cover construction, Chapter 6.2.1.6 identifies haul trucks and vibratory rollers as the loudest sources of construction noise, "over 88 dBA at 50 feet."

Give Seattle Rep's close proximity to both DT-1 and DT-2, Landau finds that the DEIS does not sufficiently evaluate the potential for noise impact to Seattle Rep from surface construction of stations or station entrances. Further, in addition to the potential for impact from the equipment identified in the DEIS, the following activities (i.e., sources of surface construction noise) were either not identified in the DEIS or additional information is required:

Truck Haul Routes

DEIS Chapter 2.6.6 (p. 2-88) states, "truck hauling would require a loading area, staging space for trucks awaiting loading, and provisions to prevent tracking soil on public streets. Truck haul routes and trucking hours would require approval by the City of Seattle. Surface hauling could occur at night during off-peak traffic periods or could be concentrated during the day to minimize noise in noise-sensitive areas." Table 7-1 of the FTA Guidance Manual (p. 176) identifies a sound level for haul trucks of 84 dBA at 50 feet.

The DEIS does not include assessment of noise from haul trucks. Noise from haul trucks includes engine idling during loading, travel to and from loading locations, and banging noise when trucks drive over uneven or unsecured surfaces that are often found at and near construction sites. Airborne noise from haul trucks is expected when collecting and moving spoils away from the DT-1 or DT-2 stations and station entrances. The likely haul routes would include Warren Avenue North and Mercer Street, both adjacent to Seattle Rep, and could therefore represent major sources of construction noise.

As indicated in the DEIS, haul trucks may operate during daytime or nighttime hours, depending on the permitted hours of hauling. Seattle Rep hosts both afternoon and late evening performances in the Leo K. and Bagley Wright Theaters. In addition, rehearsals in the Leo K. Rehearsal Space and Poncho Forum occur most days during typical daytime hours and may also occur during late evening hours. Noise from truck hauling therefore may impact facilities within Seattle Rep during day, evening, or late evening hours.

Construction Staging Areas

Noise from construction staging areas was not evaluated in the DEIS. Airborne noise from equipment moving within and to/from staging areas could represent a major source of airborne noise during construction.

Seattle Rep may be located within close proximity to construction staging areas either for DT-1 or DT-2. Although the locations of the staging areas are yet to be defined, an assessment of noise impact from staging areas should be completed that evaluates equipment within the staging areas and potential routes to/from staging areas.

Tunneling and Cut-and-Cover Construction Airborne Noise – Impacts Assessment

WSBLE DEIS Appendix N.3, Chapter 6.2 (p. 6-30) identifies construction activities that would generate the highest levels of airborne construction noise and includes tunneling and cut-and-cover station construction, both of which are proposed for preferred alternative DT-1 and alternative DT-2, both of which could occur near Seattle Rep.

Appendix N.3, Table 6-8 (p. 6-31) of the WSBLE DEIS provides a range of sound levels, referenced to 50 feet, that are anticipated from tunneling and cut-and-cover construction. Sound levels are based on the FTA Guidance Manual. As identified in Table 6-30 (p. 6-70), equipment and activities associated with cut-and-cover station construction (i.e., hydromill, caisson drilling, hoe ram, jackhammer, and bulldozer) could operate as near as 8 feet from Seattle Rep. Table 3 below identifies noise levels from the construction equipment summarized in DEIS Table 6-8, and calculates these sound levels at 8 feet, 15 feet, and 50 feet from construction equipment. Distance adjustments are based on noise propagation from a stationary source at +6 dBA per halving of distance to the source.

Table 3: Surface Construction Airborne Noise Equipment and Sound Levels

Construction Activity (a)	Construction Equipment (a)	Sound Level at 50 feet L_{eq} (dBA) (a)	Sound Level at 15 feet L_{eq} (dBA) (b)	Sound Level at 8 feet L_{eq} (dBA) (b)
Tunneling	Excavators, backhoes, haul trucks, loaders	84 to 86	94 to 96	100 to 102
Cut-and-Cover Station Construction	Excavators, backhoes, haul trucks, loaders, vibratory rollers	84 to 88	96 to 99	102 to 104

(a) Sound Transit WSBLE DEIS Appendix N.3, Table 6-8.

(b) Calculations by Landau based on 6 dBA per halving of distance to a stationary noise source.

L_{eq} = equivalent sound pressure level.

WSBLE DEIS Appendix N.3, Chapter 6.2.3.2, p. 6-38 indicates that for cut-and-cover construction of DT-1, "The construction noise would also impact spaces in the north end of the Seattle Center including Seattle Repertory Theatre and Cornish Playhouse."

For DT-2, the same page of the DEIS states that cut-and-cover construction "could result in noise impacts at the Seattle Repertory Theatre and Cornish Playhouse." Further, the same page of the DEIS states that "Most of these noise-sensitive spaces are on the perimeter of the building and face Republican Street." At Seattle Rep, facilities that are nearest Republican Street include the Leo K. Theater and the Leo K. Rehearsal Space.

As noted in Table 3, airborne noise levels from tunneling and cut-and-cover station construction could reach up to 104 dBA at a distance of 8 feet, expected at the south and east building facades of Seattle Rep. Note that the SMC sound level limits for construction, as correctly noted in WSBLE DEIS Appendix N.3, Table 3-4 (p. 3-7), is 85 dBA for a commercial district noise source affecting a commercial district receiving property, with shorter-duration increases permitted for impact-type equipment. Predicted sound levels from construction therefore could well exceed City sound level limits at Seattle Rep when construction equipment associated with tunneling and cut-and-cover stations operates within approximately 50 feet of Seattle Rep's south facade.

Although not included in the DEIS, and as indicated earlier in this letter, noise impacts from construction of the DT-1 East Station Entrance would occur immediately adjacent to the east side of Seattle Rep. Landau anticipates that much of the equipment identified in Table 3 for cut-and-cover stations also would be required for construction of the East Station Entrance. Therefore, the range of sound levels presented in Table 3 also would be anticipated at the east side of Seattle Rep.

Tunneling and Cut-and-Cover Construction Airborne Noise – Assessment of Impacts at Interior Spaces

Noise reductions provided by Seattle Rep's building itself (i.e., transmission loss provided by building construction materials) are not identified in the DEIS. Although Landau did not take exterior-interior measurements at Seattle Rep, such measurements were made at a resident organization of Seattle Center's Northwest Rooms. Results of these measurements indicate that the north facade of the

Northwest Rooms provides approximately 61 dBA in reduction to exterior noises. For the purposes of this assessment, Landau assumed a similar interior-exterior reduction applies to Seattle Rep. It should be noted that the actual level of reduction will vary depending on the effectiveness of the building to shield exterior noise and on the dominant noise frequency of the construction noise source.

Assuming an exterior-interior reduction of 61 dBA, Landau expects that, for construction noise received at Seattle Rep's south or east facade at 104 dBA (the highest predicted noise level for cut-and-cover construction, as received 8 feet from the noise source), interior noise levels would be 43 dBA (i.e., 104 dBA – 61 dBA = 43 dBA).

Using 43 dBA as an interior reference level 8 feet from construction activity, Landau estimated interior sound levels at each of the sensitive spaces within Seattle Rep. Estimates of sound levels at interior spaces were completed by estimating distances from the nearest areas of construction (i.e., the south or east facades of Seattle Rep) to each interior space and then applying a 6-dBA reduction per doubling of distance from the noise source, with 43 dBA at 8 feet as reference. The assessment assumes an additional reduction of 10 dBA is provided by interior walls to the Poncho Forum and the Bagley Wright Theater. The results of this assessment are summarized below in Table 4 for each noise-sensitive interior space at Seattle Rep.

Table 4: Surface Construction Interior Airborne Noise Impacts (DT-1)

Seattle Rep Noise Sensitive Space	Distance from Nearest Exterior Construction Activity to Interior Space (feet)	Impact Assessment Result			
		Ambient Noise Level (dBA) (c)	Reference Sound Level Inside Building Facade	Interior Construction Noise Level (dBA) (d)	Increase Over Ambient Noise Level (dBA)
Leo K. Theater	8 (a)	26	43	43	17
Leo K. Rehearsal Space	8 (a)	36		43	7
Poncho Forum	75 (b)	30		14 (e)	0
Bagley Wright Theater	45 (b)	32		18 (e)	0

(a) Sound Transit WSBLE DEIS Appendix N.3, Table 6-30, p. 6-70 applies to most sensitive spaces within Seattle Rep.
(b) Estimated by Landau.
(c) Sound level measurements by Landau, January and March 2022.
(d) Calculated using standard adjustment for distance from a point source: SPL2 = SPL1 + 20*Log(D1/D2).
(e) Includes an assumed 10-dBA reduction provide by interior walls.

The impact to the Leo K. Theater and the Leo K. Rehearsal Space is shown on Figure 2, which illustrates impacts as a "heat map," highlighting the spaces within Seattle Rep that would be impacted by airborne construction noise during tunneling and construction of the East Station Entrance for DT-1.

As summarized above in Table 4 and as shown on Figure 2, airborne construction noise could exceed existing conditions in the Leo K. Theater and Leo K. Rehearsal Space by up to 17 dBA and 7 dBA,

respectively for a period of up to 6 years (i.e., the estimated duration of cut-and-cover station construction, as identified in WSBLE DEIS Chapter 2.6, Table 2-6). Note that a 10-dBA increase in noise is perceived as a doubling of sound "loudness." So, an increase of 17 dBA, as predicted at the Leo K. Theater, would be perceived as more than twice as loud as ambient conditions, a clearly perceptible increase in ambient noise. Actual increases in noise may be higher depending on exterior-interior noise reductions provided by the building (i.e., if less than the estimated 61-dBA reduction). The results of this assessment indicate that mitigation will be required during surface construction related to tunneling and the cut-and-cover station. Increases over ambient conditions up to 17 dBA will very likely result in significant impacts to the Leo K. Theater, affecting performances and the audience experience.

It is noted in WSBLE DEIS Appendix N.3, Chapter 6.2.3.2, p. 6-38 that "the loudest construction phase is expected to be near the beginning of construction during the cutting and removal of the existing street, which would likely include the use of impact equipment such as jackhammers or hoe rams." Landau notes that during other phases construction noise levels may be lower. Note that the ranges of sound levels provided in Table 3 and estimates of impacts provided in Table 4 are based on the FTA reference sound levels for excavators, backhoes, haul trucks, loaders, and vibratory rollers. Therefore, reference sound levels in Table 3 do not represent the loudest noises that could occur from use of jackhammers and hoe rams and actual noise impacts may, during the initial phases, be higher than is predicted in Table 4.

For DT-2, WSBLE DEIS Appendix N.3, Table 6-30 indicates that surface construction also could be as near as 8 feet from Seattle Rep. Landau estimates that construction of the DT-2 East Station Entrance would occur as near as approximately 60 feet to the west of Seattle Rep, and the location of the cut-and-cover excavation area for DT-2 would be approximately 130 feet from Seattle Rep. Landau estimates that impacts from DT-2 would be lower than is predicted for DT-1 during cut-and-cover and East Entrance Station construction. However, should Warren Avenue North be used as a staging area or include active construction that is near Seattle Rep, impacts to interior spaces from airborne noise may occur.

Impact Noise

As indicated above, the loudest construction phase would likely include the use of impact equipment such as jackhammers or hoe rams. WSBLE DEIS Appendix N.3, Chapter 3.1.3 correctly summarizes the City construction criteria. Specifically, this section notes that impact noises, such as those noises generated by jackhammers and hoe rams, will be limited to the daytime hours of 8 a.m. to 5 p.m. weekdays and 9 a.m. to 5 p.m. weekends. The Final Environmental Impact Statement (FEIS) and subsequent construction management plans should include consideration of timing restrictions for these types of impact noises.

Chapter 6.3: Operational Vibration Impacts

The operational vibration section of WSBLE DEIS Appendix N.3 includes predicted impacts from both vibration and groundborne noise during operation of the proposed DT-1 and DT-2 alternatives. WSBLE DEIS Appendix N.3, Tables 6-13 (p. 6-51) and 6-14 (p. 6-53) identify operational groundborne noise and vibration impacts for DT-1 and DT-2, respectively.

The results in WSBLE DEIS Appendix N.3, Table 6-13 (and in WSBLE DEIS Appendix N.3, Attachment N.3H, Table 7-3) indicate that the Leo K. Theater would likely experience groundborne levels of up to 48 dBA during operation of DT-1, a 13-dBA exceedance of the DEIS-applied limit of 35 dBA. Table 6-14 indicates that the Leo K. Theater would likely experience groundborne noise levels of up to 28 dBA during operation of DT-2, below the DEIS-applied limit of 35 dBA.

Landau finds that additional information and/or corrections are required to evaluate completely the potential for operational vibration and groundborne noise impacts to Seattle Rep. The following summarizes these findings:

Groundborne Noise Limits

Leo K. Theater

As summarized in Table 1, the groundborne noise limit for Seattle Rep's Leo K. Theater is not sufficiently protective and should be adjusted to 25 dBA, identified as the FTA Special Buildings limit for a "Concert Hall" (i.e., not based on the 35-dBA limit for a theater). Correcting the limit at the Leo K. Theater would result in a greater groundborne noise impact (23 dBA over limit) for operation of DT-1. Further, for operation of DT-2, correcting the limit would result in a groundborne noise impact (i.e., 3 dBA over limit of 25 dBA).

Bagley Wright Theater

WSBLE DEIS Appendix N.3, Attachment N.3H, Table 7-3 identifies groundborne noise levels from DT-2 that are higher at the Leo K. Theater (28 dBA) than at the Bagley Wright Theater (19 dBA). The Bagley Wright Theater is substantially closer to DT-2 than the Leo K. Theater, and it would stand to reason that predicted groundborne noise levels at the Bagley Wright Theater would be higher during operation of DT-2. The assessment of impact at the Bagley Wright Theater should be confirmed and likely corrected to accurately identify whether impacts are predicted for this space under DT-2.

Leo K. Rehearsal Space

The Leo K. Rehearsal Space was not included the DEIS. However, as previously mentioned, this space is used for noise- and vibration-sensitive rehearsals and should be included when considering the potential for groundborne noise and vibration impacts from WSBLE operation. This space is located at the southwest corner of Seattle Rep and near the cut-and-cover area for DT-1; the space is also adjacent to the proposed construction area defined in the DEIS, located east of Seattle Rep within the right-of-way of Warren Avenue North. As suggested in Table 2, the proposed noise limit for this space

is 30 dBA. The suggested noise limit is 6 dBA lower than was measured by Landau (see Figure 5; the measured level at Leo K. Rehearsal Space is 36 dBA); however, groundborne noise is a different character of sound than is present in the Leo K. Rehearsal Space ambient environment. A limit of 30 dBA would ensure that the noise environment of the Leo K. Rehearsal Space is protected.

Poncho Forum

Similar to the Leo K. Rehearsal Space, the Poncho Forum was not included the DEIS. However, as previously indicated, this space is used for noise- and vibration-sensitive performances and rehearsals and should be included when considering the potential for groundborne noise and vibration impacts from WSBLE operation. As suggested in Table 2, the suggested noise limit for this space is 30 dBA, which agrees with results of ambient measurements made by Landau (see Figure 5).

Revised Assessment of Operational Groundborne Noise Impacts

Assessment of Exceedance of Sound Level Limits

For this assessment, Landau compared predicted operational groundborne noise levels to the corrected limits for the Leo K. Theater as well as new limits for spaces not included in the DEIS (i.e., the Leo K. Rehearsal Space and Poncho Forum). The results were compared with the operational groundborne noise assessment results that are summarized WSBLE DEIS Appendix N.3, Table 6-13. The results of this comparison for DT-1 are summarized below in Table 5.

Table 5: Assessment of Groundborne Noise Exceedance of Limits, DT-1

Seattle Rep Noise Sensitive Space	DT-1 Operational Noise Level (a)	Groundborne Noise Limit		Exceedance	
		DEIS (a)	Adjusted and New Limits (d)	Compared to DEIS (b)	Compared to Adjusted and New Limits
Leo K. Theater	48	35	25 (d)	13	23
Leo K. Rehearsal Space	48 (b)	-	30 (d)	-	18
Poncho Forum	43 (c)	-	30 (d)	-	13
Bagley Wright Theater	37	35	35	2	2

(a) Sound Transit WSBLE DEIS Appendix N.3, Table 6-13 and Attachment N.3H, Table 7-2.
(b) Impact assumed identical to Leo K. Theater due to similar distance from DT-1.
(c) Impact assumed approximately equal to average of predicted impact to Leo K. Theater and Bagley Wright Theater.
(d) Based on sound level measurements by Landau in 2022 and sensitivities of each space.

As summarized in Table 5, applying adjustments to the noise limit at the Leo K. Theater and including an assessment of the Leo K. Rehearsal Space and Poncho Forum results in high levels of noise impact at most spaces within Seattle Rep. Specifically, at the Leo K. Theater, DEIS-predicted groundborne noise levels would exceed the adjusted limit by 23 dBA. Similarly, at the Leo K. Rehearsal Space DEIS-predicted groundborne noise levels would exceed the assumed limit by 18 dBA. Exceedances of up to 13 dBA are predicted at the Poncho Forum.

For DT-2, as summarized in WSBLE DEIS Appendix N.3, Attachment N.3H, Table 7-3, predicted groundborne noise impacts would be below applicable limits at the Bagley Wright Theater. Adjusting the Leo K. Theater limit to 25 dBA would result in an exceedance of 3 dBA for DT-2. However, as noted previously, Landau finds that the predicted impacts under DT-2 do not appear correct and should be re-evaluated before a thorough review and conclusion can be made.

Assessment of Impact

In addition to the assessment of exceedance of groundborne noise limits, Landau evaluated the potential for impacts based on increases over existing ambient conditions (i.e., a comparison to actual ambient levels, not limits). The assessment was completed to highlight the degree of impact that may occur at Seattle Rep with the DT-1 alignment. Because Landau is not confident that the DEIS has accurately estimated groundborne noise for DT-2, the following assessment focuses only on DT-1.

Table 6 summarizes predicted operational groundborne noise emissions at each space within Seattle Rep and compares these predictions with existing ambient conditions, as documented by Landau through noise measurements made in early 2022. The increase in sound levels over ambient conditions is provided in the far right column of this table.

Table 6: Assessment of Operational Groundborne Noise Impacts, DT-1

Seattle Rep Noise Sensitive Space	DT-1 Operational Noise Level (dBA) (a)	Existing Ambient Noise Level (dBA) (d)	DT-1 Operational Noise Increase Over Ambient Noise (dBA)
Leo K. Theater	48	26	22
Leo K. Rehearsal Space	48 (b)	36	12
Poncho Forum	43 (c)	30	13
Bagley Wright Theater	37	32	5

(a) Sound Transit WSBLE DEIS Appendix N.3, Table 6-13 and Attachment N.3H Table 7-2.
(b) Impact assumed identical to Leo K. Theater due to similar distance from DT-1.
(c) Impact assumed approximately equal to average of predicted impact to Leo K. Theater and Bagley Wright Theater.
(d) Based on sound level measurements by Landau in 2022.

As summarized in Table 6, a comparison of predicted groundborne noise levels from operation with existing ambient sound levels suggests high levels of impact at Seattle Rep for DT-1. Noise levels at the Leo K. Theater would exceed ambient conditions by up to 22 dBA, a clearly audible and discernible impact that could inhibit use of this facility. That is, as noted earlier, a 10-dBA increase in noise is perceived as a doubling of sound “loudness.” So, an increase of 22 dBA, as predicted at the Leo K. Theater for operational groundborne noise impact, would be perceived as more than four times as loud as ambient conditions, a clearly perceptible increase in ambient noise. Increases in noise at the Leo K. Rehearsal Space and Poncho Forum would be up to 12 dBA and 13 dBA over ambient conditions, respectively, also clearly perceptible as more than twice as loud as ambient conditions. At the Bagley Wright Theater, the impact would be less, but a 5-dBA increase over ambient conditions,

especially from a noise source that is primarily a low-frequency rumble (i.e., groundborne noise), is expected to negatively affect the usability of this theater.

Included on Figure 4 is a heat map that highlights impacts that would occur from increases over ambient conditions from DT-1 operational groundborne noise.

Train Speed

As summarized in WSBLE DEIS Appendix N.3, Tables 6-13 (p. 6-51) and 6-14 (p. 6-53), light rail train speeds were assessed as part of the calculation of groundborne noise and vibration. Landau finds that there are inconsistencies or potential errors that warrant further clarification.

For preferred alternative DT-1, the train speed through the Seattle Center campus is identified in Table 6-13 as 45 miles per hour (mph) near most noise-sensitive receivers, including the Seattle International Film Festival (SIFF) Film Center, which is located immediately southeast of Seattle Rep. But at Seattle Rep and the Vera Project, rail speeds are predicted to be 30 mph. Landau anticipates that rail speeds between Seattle Rep and SIFF would be identical and not differ by 15 mph. Appendix N.3 of the WSBLE DEIS does not provide an explanation for the discrepancy in rail speeds. It is understood that rail speeds would slow when trains are arriving at the station and would increase when trains are departing. However, the discrepancies in rail speeds suggest that there may be calculation errors related to the speed of trains along the rail alignment.

Chapter 6.4: Construction Vibration Impacts

Construction-related vibration impacts, including groundborne noise, are predicted to occur from tunneling (Chapter 6.4.1) and surface construction (Chapter 6.4.2). As indicated earlier, WSLBE DEIS Chapter 2.6, Table 2-6 provides estimated durations for various construction activities related to WSBLE. Tunneling for the Downtown Segment is estimated to take 2.5 to 3 years and cut-and-cover station construction is estimated to take 4 to 6 years to complete.

Chapter 6.4.1: Tunneling Vibration Impacts

During tunneling, the DEIS predicts that vibration impacts would not occur at Seattle Rep. The following summarizes adjustments in vibration and groundborne noise limits, as previously identified (see Table 1), as well as limits for spaces that should be included in the assessment (see Table 2) that would result in additional or greater impacts to sensitive spaces within Seattle Rep.

As summarized in Table 1, Landau recommends adjusting the vibration limit for Seattle Rep to 65 VdB from 72 VdB for both the Leo K. and Bagley Wright Theaters. WSBLE DEIS Appendix N.3, Chapter 6.4.1, Table 6-25 identifies a predicted supply train level of 67 VdB at Seattle Rep. Adjusting the limit at Seattle Rep would result in a predicted vibration level that is 2 VdB over the 65 VdB limit at Seattle Rep during unmitigated use of the supply train with alternative DT-1.

Regarding groundborne noise, Landau recommends adjusting the groundborne noise limit at Seattle Rep to 25 dBA (see Table 1). This would result in groundborne noise impacts from both cutterhead and supply train operation that exceed what is predicted in WSBLE DEIS Appendix N.3, Chapter 6.4.2, Table 6-27. For example, unmitigated supply train groundborne noise at Seattle Rep is predicted to be 40 dBA, which would exceed the adjusted limit of 25 dBA by 15 dBA and would be clearly discernible and disruptive.

Table 7 summarizes predicted tunneling groundborne noise emissions at each space within Seattle Rep and compares these predictions with existing ambient conditions, as documented by Landau through noise measurements made in early 2022. The increase in sound levels over ambient conditions is provided in the far right column of this table.

Table 7: Assessment of Tunneling Groundborne Noise Impacts, DT-1

Seattle Rep Noise Sensitive Space	DT-1 Tunneling Noise Level (dBA) (a)	Existing Ambient Noise Level (dBA) (d)	DT-1 Operational Noise Increase Over Ambient Noise (dBA)
Leo K. Theater	40	26	14
Leo K. Rehearsal Space	40 (b)	36	4
Poncho Forum	35 (c)	30	5
Bagley Wright Theater	29	32	0

(a) Sound Transit WSBLE DEIS Appendix N.3, Table 6-27.
(b) Impact assumed identical to Leo K. Theater due to similar distance from DT-1.
(c) Impact assumed approximately equal to average of predicted impact to Leo K. Theater and Bagley Wright Theater.
(d) Based on sound level measurements by Landau in 2022.

As summarized in Table 7, a comparison of predicted groundborne noise levels from tunneling with existing ambient sound levels suggests high levels of impact at Seattle Rep for DT-1. Noise levels at the Leo K. Theater would exceed ambient conditions by up to 14 dBA, a clearly audible and discernible impact that would be perceived as more than twice as loud as ambient conditions and could inhibit use of this facility for up to 3 years (the estimated duration of tunneling for the Downtown Segment). Impacts to the Leo K. Rehearsal Space and Poncho Forum would be much less, but very likely perceptible and possibly disruptive during use of these spaces.

Included on Figure 3 is a heat map that highlights impacts that would occur from increases over ambient conditions from DT-1 tunneling groundborne noise.

Tunneling Equipment

WSBLE DEIS Appendix N.3, Section 6.4.1.2 and Table 6-26 (p. 6-66) identify equipment that would generate the highest levels of vibration during tunneling, including the boring machine cutterhead, thrust-jack retraction, and supply trains with steel wheels and jointed tracks.

In the footnote of Table 6-27 (p. 6-67), the WSBLE DEIS states, "The predicted levels for the thrust jack are more than 5 dB below the impact threshold for all sensitive receivers." Groundborne noise predictions for thrust-jack retraction are not provided in the WSBLE DEIS. However, Table 6-26 (p. 6-66) provides a range of sound levels of 13 to 29 dBA, as measured between 0 and 200 feet from thrust-jack operation. The range in sound levels for supply trains with steel wheels and jointed tracks is 24 to 28 dBA. While the median level of groundborne noise for supply trains is clearly higher than for thrust-jack retraction, there is a potential for thrust-jack retraction to generate groundborne noise levels that are as high as supply trains, according to the data provided in Table 6-26. The potential for groundborne noise impact is further increased when the limits for Seattle Rep are adjusted (i.e., lowered).

A more detailed assessment should be conducted that further evaluates the potential for groundborne noise and vibration impact from thrust-jack retraction.

Chapter 6.4.2: Surface Construction Vibration Impacts

WSBLE DEIS Appendix N.3, Table 6-29, p. 6-70 identifies distances for impact to Special Buildings during surface construction. The minimum distance for the least sensitive spaces (i.e., Vibration Criteria A, or V.C.-A) is greater than would be realized at Seattle Rep for the equipment identified in this table. For example, the minimum distance for potential impact from a bulldozer under the V.C.-A curve is 125 feet, and the nearest distance to Special Buildings located near surface construction areas (Seattle Rep) is 8 feet, as documented in WSBLE DEIS Appendix N.3, Table 6-29.

WSBLE DEIS Appendix N.3, Chapter 6.4.2.2, p. 6-70 states that "Surface construction vibration has not been assessed for Category 1 or special-use buildings near tunnel alignments. However, vibration from surface construction may be of concern if these buildings are close to the tunnel portals or station construction. These activities should be assessed in the Construction Vibration Control Plan."

Given the degree of impact that may occur from surface vibration during construction (see Tables 6-29 and 6-30) and given the need to understand if effective mitigation of these impacts is feasible, a more detailed assessment of the potential impacts and proposed mitigation should be included in a supplemental DEIS study, in lieu of only requiring future assessments through a control plan. Specifically, for cut-and-cover station excavation, an additional assessment should be completed that evaluates the potential for structural damage to Seattle Rep.

Slurry Wall Demolition

The south wall of the DT-1 station design includes a diagonal portion that would extend underneath the Northwest Rooms, including underneath the SIFF Film Center, Vera Project, and KEXP. A profile view of the station is provided on WSBLE DEIS Appendix J, Drawing B11-ASX102. Landau understands, through ongoing workshops hosted by Sound Transit, that the southern wall of the DT-1 station would be constructed first as a vertical slurry wall, and then widened below grade, toward the south, to provide sufficient space for a station platform. Further, Landau understands that construction

methods to expand the station footprint include breaking large portions of the slurry wall with a hoe ram.

The WSBLE DEIS does not include a review of impacts that are specific to the breaking of the slurry wall. However, demolition of this wall would occur very near and to the south of Seattle Rep. It is anticipated that high levels of vibration would be emitted during this process, and these were not considered or included in the DEIS. Given the high levels of vibration from this activity and the likely lengthy construction schedule, there is a high potential for substantial impacts to Seattle Rep during this phase of construction.

Station Entrances

The WSBLE DEIS provides very minimal information on the potential for noise and vibration impacts from construction of the station entrances. Specifically, for DT-1 the proposed East Station Entrance would be located directly adjacent to Seattle Rep. Construction of this station entrance would likely require demolition of existing structures and surfaces, excavation and hauling of materials, reinforcement of station walls, and construction of the station itself. Vibration and groundborne noise impacts are likely to be experienced at Seattle Rep.

Adjusting the vibration limits for the Leo K. and Bagley Wright Theaters to 65 VdB from 72 VdB would be protective of these facilities during surface construction of the East Station Entrance given the low levels of ambient vibration at both facilities (see ambient vibration measurement data in WSBLE DEIS Appendix N.3, Attachment N.3H, Table 7-1, and verified by Landau measurements in January 2022).

Given the very close proximity of the DT-1 East Station Entrance to Seattle Rep and the proximity of Seattle Rep to the DT-2 East Station Entrance, as well as the recommended adjustments of vibration limits for Seattle Rep, an assessment of station entrance construction should be completed to evaluate the potential for impacts. In addition, an assessment should be completed of the potential for structural damage to Seattle Rep's building.

Chapter 7: Noise and Vibration Mitigation Measures

Chapter 7.2: Construction Noise Mitigation

DEIS Appendix N.3, Chapter 7.2 (p. 7-16) identifies standard mitigation measures for construction noise. The following summarizes mitigation measures that were not included but should be considered:

General Construction Equipment

Loud construction equipment operating within the cut-and-cover construction area could operate as near as 8 feet from Seattle Rep. As summarized in Table 3, estimated sound levels could reach 104 dBA at the exterior facade of the Seattle Rep and could reach up to 43 dBA at interior spaces, potentially impacting noise-sensitive performance and rehearsal spaces (see Table 4).

Mitigation measures summarized in the WSBLE DEIS are effective strategies to reduce airborne construction noise but do not specifically target the potential for noise impacts.

Mitigation measures should include an emphasis on administrative controls, scheduling the noisiest activities during times that would be less likely to interfere with noise-sensitive operations. This will require continued coordination with Seattle Rep.

Noise barriers could be installed at locations where airborne noise impacts are predicted or anticipated, and where there is sufficient room to build a wall that is long and tall enough to be effective. Noise barriers should be required as part of the project's Construction Noise Control Plan and should be considered for the south, east, and west walls of Seattle Rep, shielding them from station and East Entrance construction noise impacts.

Tunnel Ventilation Fans

Ventilation fans will be required to provide fresh air to crew within the tunnel and could operate 24 hours per day. The locations of the fans are not yet defined but could be located very near to Seattle Rep. Due to the low-frequency noise generated by such fans, mitigation may be required to ensure that fan noise does not result in impacts to interior performance and recording spaces.

Potential mitigation measures could include quieter fan models, strategic placement of fans, silencers, barriers, or other measures. Further, the FEIS should include specific language within the Construction Noise Control Plan regarding exhaust fan noise.

Haul Trucks

Noise from idling and the movement of haul trucks during construction, as well as noises from driving over uneven or unsecured surfaces, may result in impacts at noise-sensitive spaces along routes accessing DT-1 or DT-2. Haul truck routes are not yet defined; however, an assessment should be completed to determine if mitigation of noise from haul trucks is warranted.

Further, the FEIS should include specific language within the Construction Noise and Vibration Control Plan regarding permitted haul routes that minimize the potential for impact.

Landau anticipates that Mercer Street would likely serve as a primary haul route for either DT-1 or DT2. If so, there is a possibility that additional noise impacts may occur at Seattle Rep. A study should be completed to identify the number of trucks in use per hour during various construction phases, what the predicted impacts may be to Seattle Rep, and what mitigation measures may be warranted (e.g., limited hauling hours, limited trucks per hour).

Staging Areas

Mitigation of staging area noise should be included in an updated noise impact assessment. Mitigation measures could include the strategic location of staging areas to minimize impacts from noise

emissions related to staging areas, noise barriers, and other measures as defined in WSBLE DEIS Appendix N.3, Chapter 7.2.

Chapter 7.3: Operational Vibration Mitigation

WSBLE DEIS Appendix N.3, Chapter 7.3.2.2 (p. 7-26) provides DT-1 operational groundborne noise and vibration measures that would mitigate impacts at "recording studios and performance spaces in Seattle Center" (Chapter 7.3.2.2., p. 7-26). Included are high-resilience fasteners along 900 feet of new track between construction alignment stations 79+00 and 88+00.

Table 6-11 (p. 140) of the FTA Guidance Manual states that high-resilience fasteners can achieve 5 dB of reduction in groundborne noise from tracks at frequencies above 40 hertz (Hz). As stated in WSBLE DEIS Appendix N.3, Attachment N.3H, Chapter 8.4, p. 8-20, "Because Sound Transit expects at least 5 decibels of reduction from the tunnel structure that is not included in the prediction model, no additional mitigation measures beyond high-resilience fasteners are proposed."

If the above-noted Sound Transit expectation is true, groundborne noise impacts from DT-1 operation would not be mitigated for Seattle Rep. As noted in this review, Landau recommends that for Seattle Rep, groundborne noise limits be adjusted to a lower level that is more protective of the uses within these spaces, including the Leo K. Theater (see Table 1). The result would be DT-1 operational groundborne noise that exceeds the limits at Seattle Rep by 23 dBA. Accounting for an assumed 5-dBA reduction from high-resilience fasteners and an additional 5-dBA reduction from the structure itself, the Leo K. Theater would likely experience increases of 13 dBA above the limit. Therefore, because impacts would occur even with high-resilience fasteners, Landau recommends that a higher degree of mitigation be considered, such as a floating slab and thicker tunnel materials.

For DT-2, WSBLE DEIS Appendix N.3, Attachment N.3H, Table 7-3 indicates that impacts may occur at the Leo K. Theater when applying the adjusted groundborne noise limit identified in Table 1 (i.e., predicted level is 28 dBA; the proposed limit is 25 dBA). Further, as previously noted, there are apparent errors in the calculation of impacts at the Bagley Wright Theater that result in predicted groundborne noise impacts at this space from DT-2. Sound Transit should confirm whether impacts are predicted, and the degree to which these impacts might occur. Once confirmed, a reassessment of DT-2 operational mitigation should be completed.

Chapter 7.4: Construction Vibration Mitigation

Chapter 7.4.1: Potential Surface Construction Vibration Mitigation

WSBLE DEIS Appendix N.3, Chapter 7.4.1 (p. 7-31) identifies surface vibration mitigation measures that include pre-construction surveys, construction timing, equipment locations, continuous vibration monitoring, and alternative construction methods. The following summarizes mitigation measures that are not included or that require additional detail:

Construction Vibration Control Plan

As noted in Chapter 6.4.2.2 (p. 6-70) of the WSBLE DEIS Appendix N.3, "Surface construction vibration has not been assessed for Category 1 or special-use buildings near tunnel alignments. However, vibration from surface construction may be of concern if these buildings are close to the tunnel portals or station construction. These activities should be assessed in the Construction Vibration Control Plan."

Construction vibration measures should be updated once a more detailed assessment of surface vibration measures is completed to support a Construction Vibration Control Plan. Given the high potential for surface vibration impact during construction, mitigation of surface vibration will be critical to Seattle Rep.

Chapter 7.4.2 Potential Tunneling Vibration Mitigation

WSDBLE DEIS Appendix N.3, Chapter 7.4.2 (p. 7-32) identifies mitigation measures to reduce the potential for vibration and groundborne noise impact during tunneling. The following summarizes key elements of this review:

Supply Train

Details provided in WSBLE DEIS Appendix N.3, Chapter 7.4.2 are focused on mitigating vibration from the supply train, including reduced supply train speeds, smooth running surfaces, reduced gaps between rail sections, adding rubber pads between ties, and using rubber tires on supply trains.

As noted, WSBLE DEIS Appendix N.3, Table 6-27 (p. 6-67) summarizes impacts from construction that states unmitigated supply trains could result in groundborne noise levels at Seattle Rep that are up to 40 dBA and exceed the unadjusted noise limit by 5 dBA (and exceed the adjusted noise limit by 15 dBA). In addition to the mitigating effects of the measures identified above, Chapter 7.4.2 (p. 7-32) of the WSBLE DEIS Appendix N.3 suggests that rubber tires on supply trains could provide effective mitigation of vibration and groundborne noise at frequencies above 10 Hz.

Given the high level of impact that may occur due to the supply trains at Seattle Rep and that predictive modeling has not been completed to fully evaluate the mitigating effect of rubber tires on supply trains, the Construction Vibration Control Plan should be supported by a detailed assessment of rubber tires on supply trains. The assessment should demonstrate that impacts to Seattle Rep are effectively mitigated to below applicable noise limits and ambient levels.

Thrust Jack

As indicated, mitigation of vibration from thrust jacks may be warranted through slower retraction of the jacks. An evaluation should be completed once a more detailed assessment of the potential for impact from this activity is completed. If necessary, mitigation measures should be included in the Construction Vibration Control Plan.

Cutterhead

As stated in WSBLE DEIS Appendix N.3, Chapter 7.4.2, p. 7-32, it is not possible to mitigate vibration from the tunneling cutterhead. However, as stated, mitigation can be achieved through vibration monitoring and coordination with Seattle Rep. The FEIS and Construction Vibration Control Plan should specify locations/receivers to be monitored at Seattle Rep, including the number of monitors and duration of monitoring, as well as the established thresholds above which action is to be taken. Also, the Plan should include clear direction for the General Contractor to coordinate with Seattle Rep to provide sufficient advance notice to allow noise-sensitive events to be scheduled accordingly.

* * * * *

If you have you any questions or comments regarding the information provided in this letter report, please contact the undersigned.

LANDAU ASSOCIATES, INC.

Kevin Warner
Principal

Kristen Wallace
Principal

References

FTA. 2018. Transit Noise and Vibration Impact Assessment Manual. FTA Report No. 0123. Federal Transit Administration. September. https://www7.fta.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf.

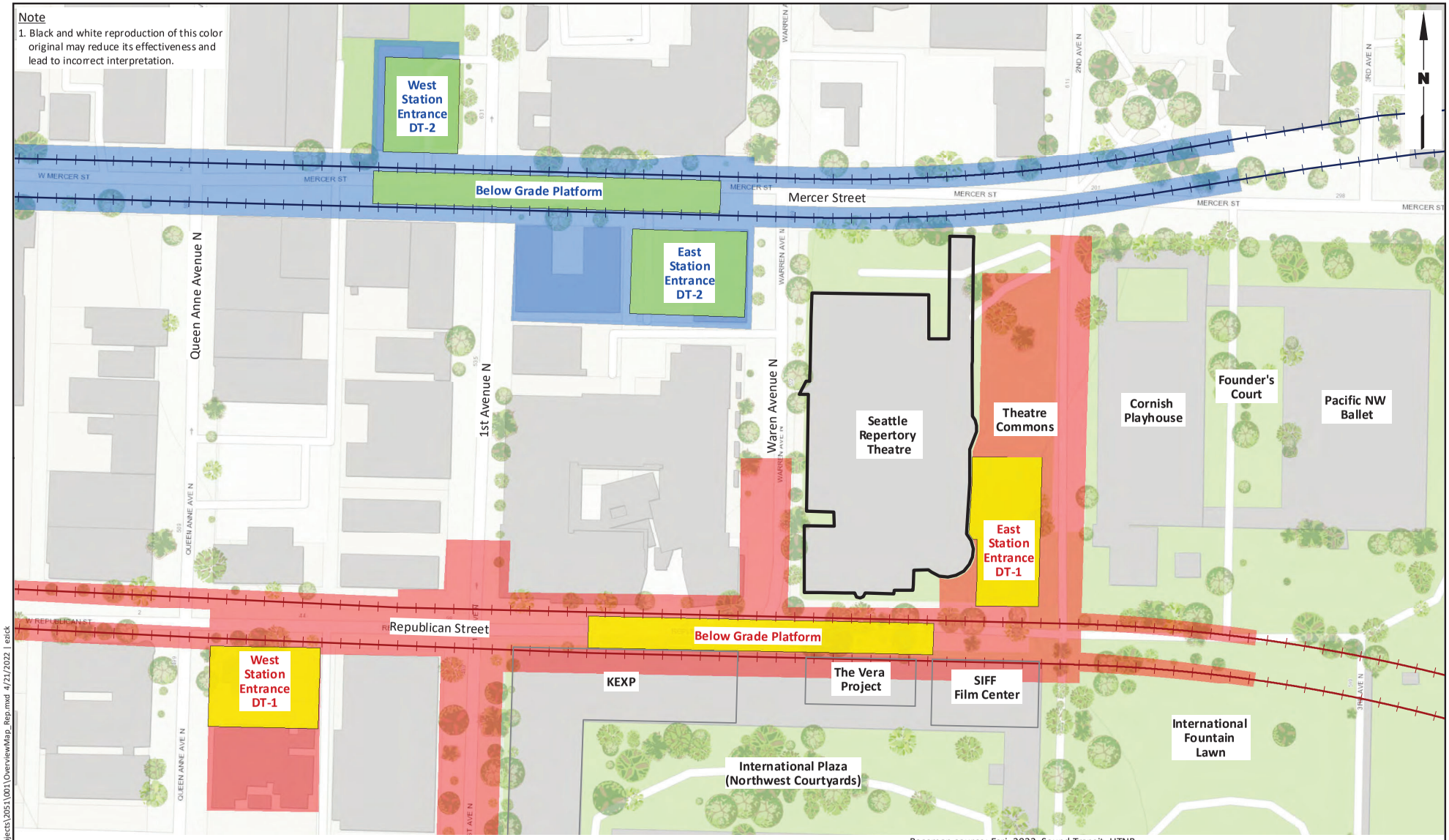
Sound Transit. 2021. Design Criteria Manual. Amendment 11 Revision 5. May. https://www.soundtransit.org/sites/default/files/documents/design-criteria-manual-may-2021.pdf.

USDOT, FTA, and Sound Transit. 2022a. West Seattle and Ballard Link Extensions Draft Environmental Impact Statement. US Department of Transportation, Federal Transit Administration, and Central Puget Sound Regional Transit Authority (Sound Transit). January. https://www.soundtransit.org/get-to-know-us/documents-reports/west-seattle-ballard-link-extensions-draft-environmental-impact-0.

USDOT, FTA, and Sound Transit. 2022b. West Seattle and Ballard Link Extensions Draft Environmental Impact Statement, Appendix N.3: Noise and Vibration Technical Report. US Department of Transportation, Federal Transit Administration, and Central Puget Sound Regional Transit Authority (Sound Transit). January. https://www.soundtransit.org/sites/default/files/documents/16a-wsble-drafteis-noisetechreport-202201.pdf.

Attachments

Figure 1: Overview Map
Figure 2: Landau Ambient Noise Measurements at Seattle Rep
Figure 3: Landau Ambient Vibration Measurements at Seattle Rep
Figure 4: Surface Construction Noise Impact, DT-1
Figure 5: Tunneling Noise Impact, DT-1
Figure 6: Operational Noise Impact, DT-1


Note
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.
West Station Entrance DT-2
Below Grade Platform
Mercer Street
East Station Entrance DT-2
Queen Anne Avenue N
1st Avenue N
Waren Avenue N
Seattle Repertory Theatre
Theatre Commons
Cornish Playhouse
Founder's Court
Pacific NW Ballet
East Station Entrance DT-1
Republican Street
Below Grade Platform
West Station Entrance DT-1
KEXP
The Vera Project
SIFF Film Center
International Fountain Lawn
International Plaza (Northwest Courtyards)
N
Legend
DT-1 Tracks
DT-1 Platform and Stations
DT-1 Construction Areas
DT-2 Tracks
DT-2 Platform and Stations
DT-2 Construction Areas
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Basemap source: Esri, 2022. Sound Transit. HTNB.
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Sound Transit WSBLE DEIS
Seattle Rep
Seattle, Washington
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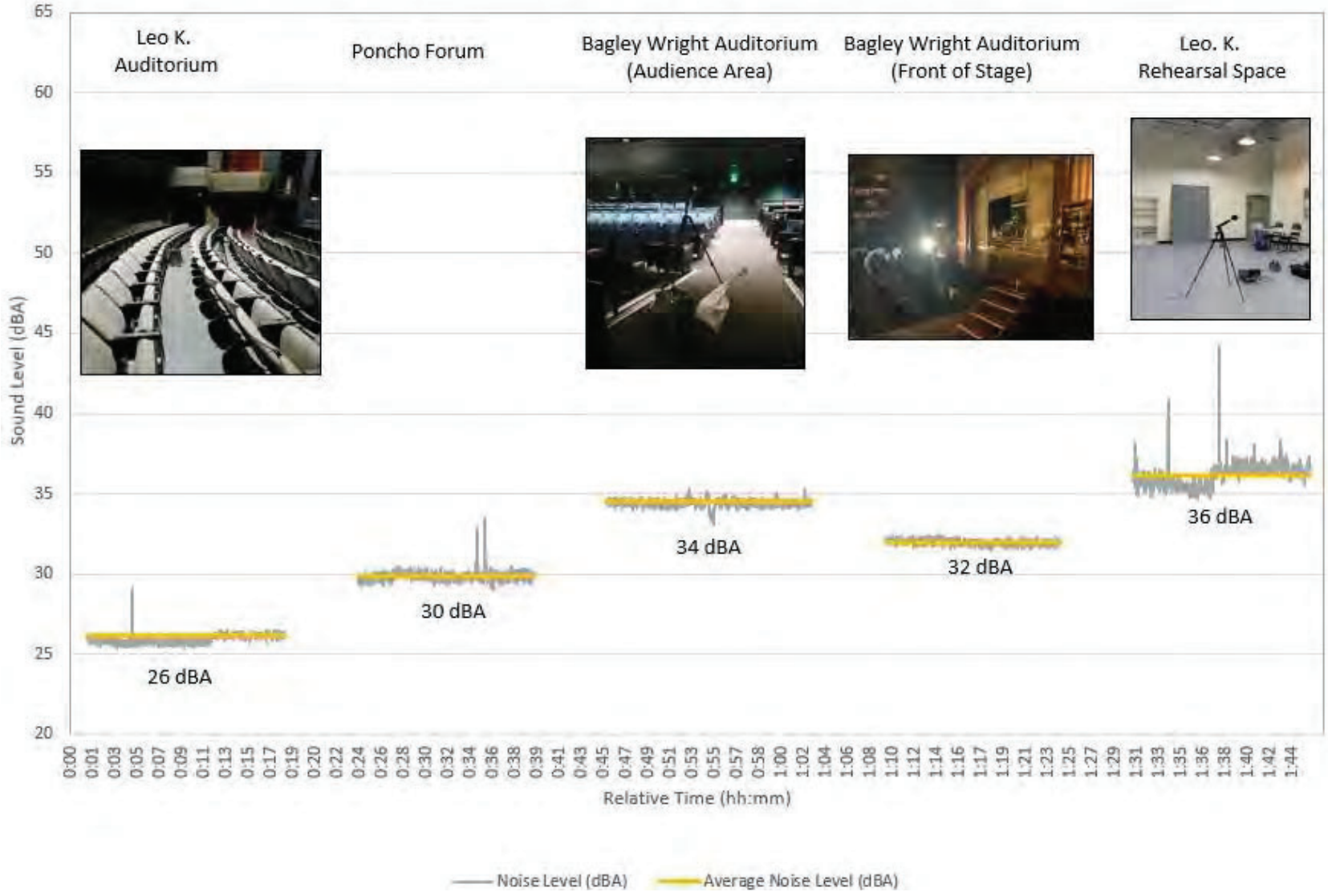
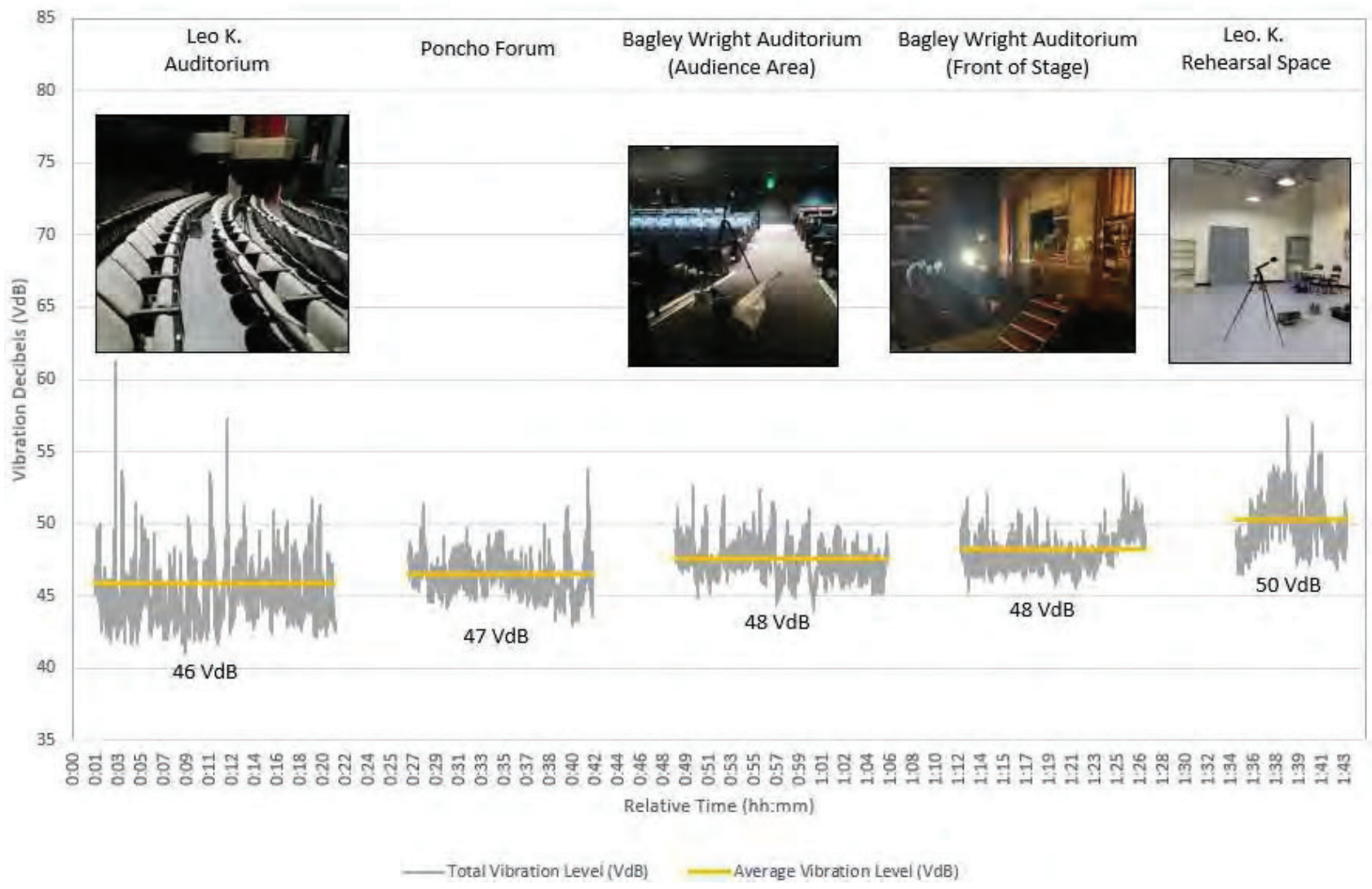


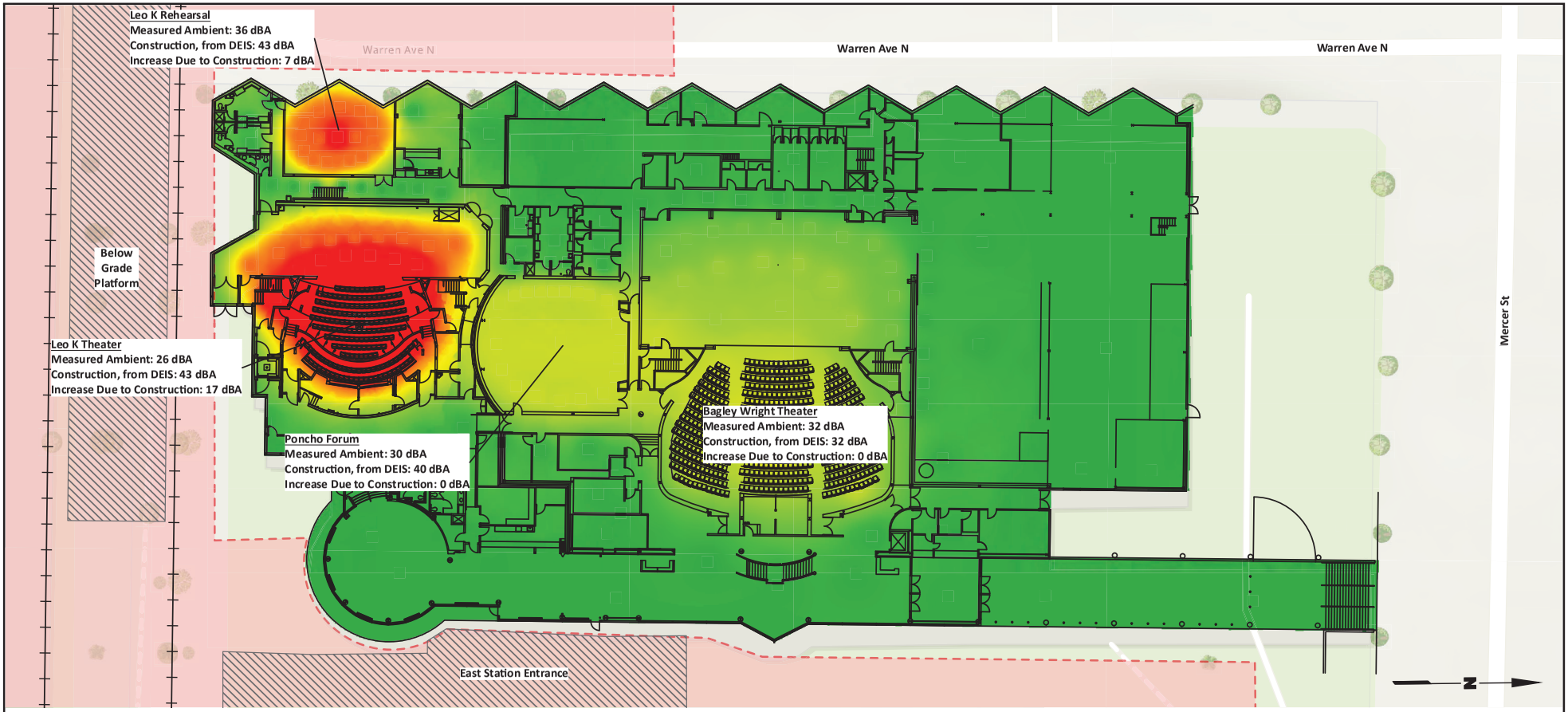
Sound Transit WSBLE DEIS Seattle Rep Seattle, Washington	**Landau Ambient Noise Measurements at Seattle Rep**	Figure 2

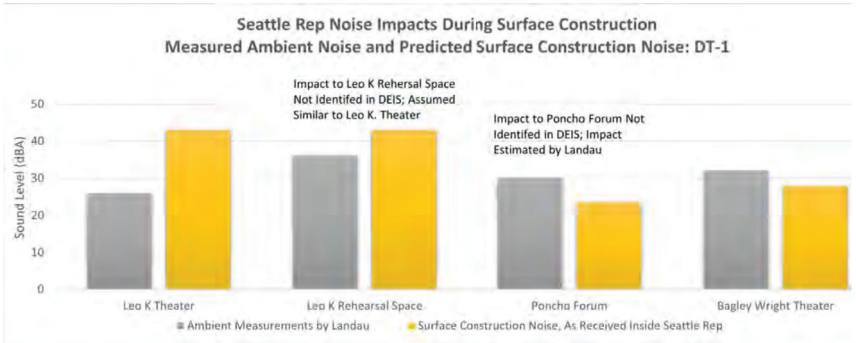
LANDAU ASSOCIATES



Sound Transit WSBLE DEIS Seattle Rep Seattle, Washington	**Landau Ambient Vibration Measurements at Seattle Rep**	Figure 3

LANDAU ASSOCIATES





Note

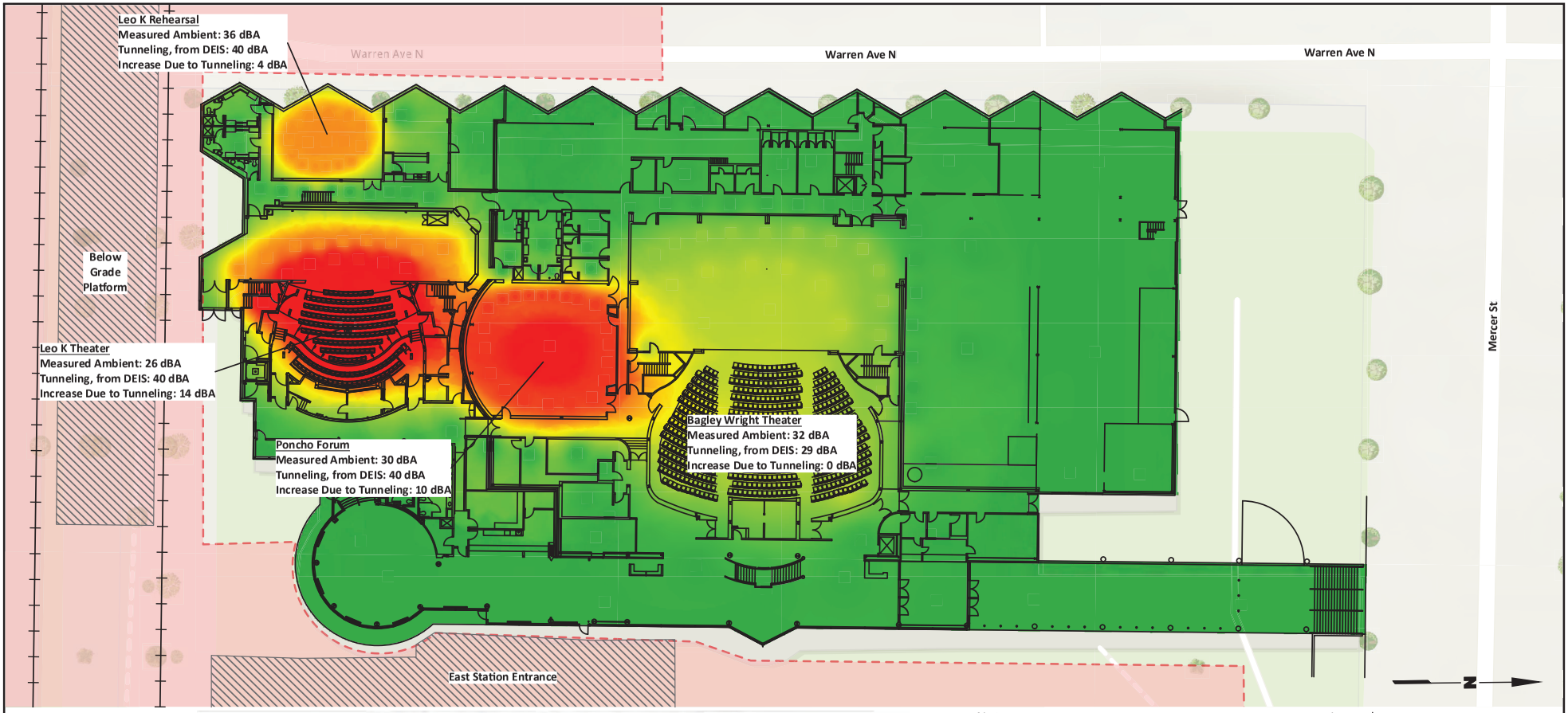
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

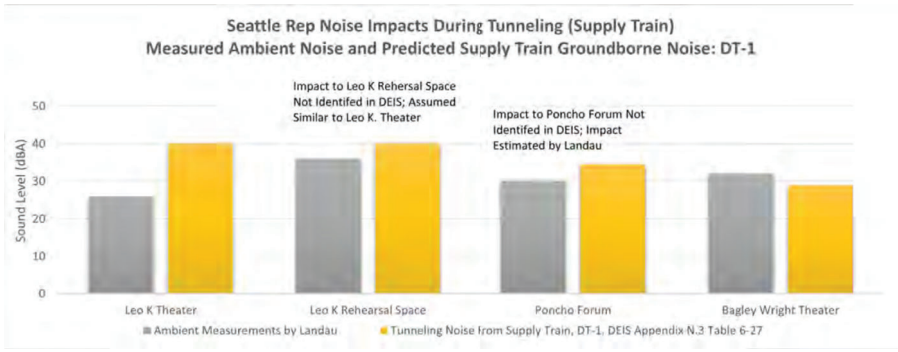
Legend

- DT-1 Tracks
- DT-1 Platform and Stations
- DT-1 Construction Areas

LANDAU ASSOCIATES

Sound Transit WSBLE DEIS Seattle Rep Seattle, Washington	**Surface Construction Noise Impact, DT-1**	Figure 4





Note

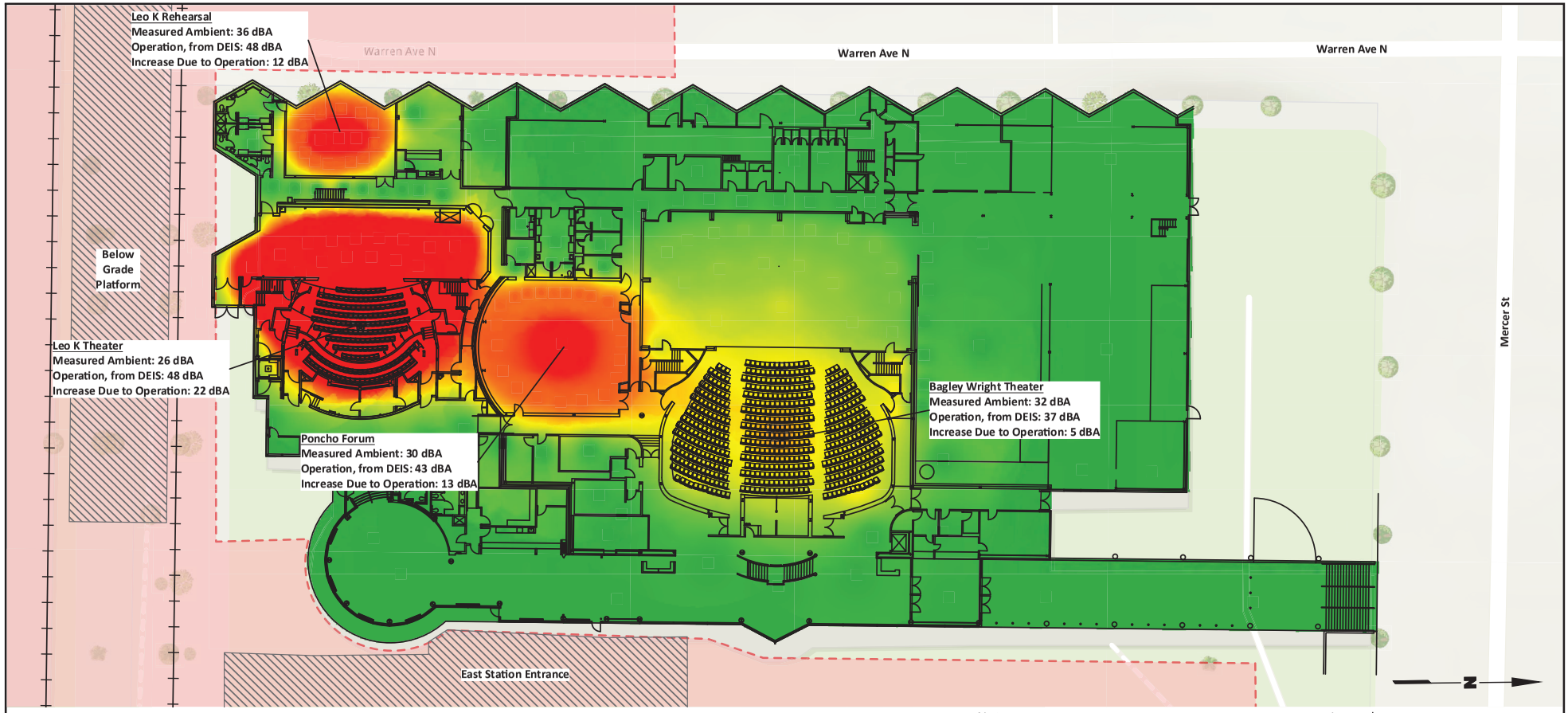
1. *Predictions of groundborne noise from tunneling at Bagley Wright Theater not provided in DEIS, estimate based on difference in operational groundborne noise estimates between Leo K Theater and Bagley Wright Theater.
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

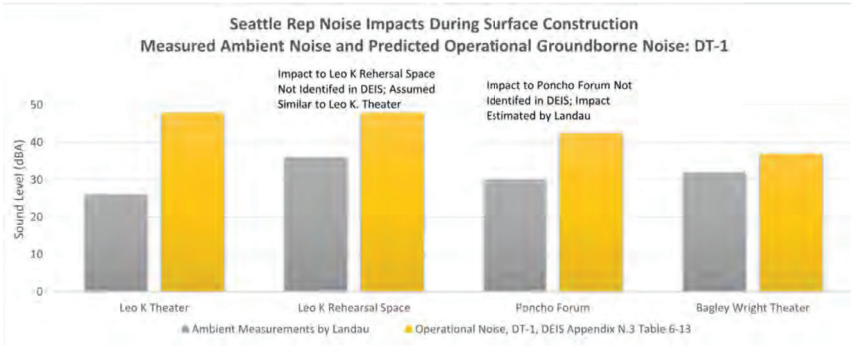
Legend

- DT-1 Tracks
- DT-1 Platform and Stations
- DT-1 Construction Areas

LANDAU ASSOCIATES

Sound Transit WSBLE DEIS Seattle Rep Seattle, Washington	**Tunneling Noise Impact, DT-1**	Figure 5





Note

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Legend

- DT-1 Tracks
- DT-1 Platform and Stations
- DT-1 Construction Areas

LANDAU ASSOCIATES

Sound Transit WSBLE DEIS Seattle Rep Seattle, Washington	**Operational Noise Impact, DT-1**	Figure 6

SCIDpda

December 9, 2024

Lauren Swift
Central Corridor Environmental Manager
Sound Transit
401 South Jackson Street
Seattle, WA 98104

Sent via email to lauren.swift@soundtransit.org

Dear Ms. Swift,

The Seattle Chinatown International District Preservation and Development Authority (SCIDpda) is a community development organization whose mission is to preserve, promote, and develop the Seattle Chinatown International District (CID) as a vibrant community and unique ethnic neighborhood. We provide housing to close to 1000 residents and commercial spaces to over 50 neighborhood businesses. SCIDpda will celebrate its 50th Anniversary in 2025.

We are stakeholders who live, work, own businesses, and property in the CID Segment of the Ballard Link Extension (BLE) project alignment. We do not claim to represent the entire community within the CID Segment, but we do serve a broad spectrum of resident, business, non-profit, community development, service provider, arts, and cultural interests.

We are pleased to offer our comments today in support of preparing a new draft environmental impact statement (draft EIS) for the BLE project. Since the Sound Transit Board identified a preferred alternative in March 2023, we have been working with Sound Transit to better define what our stakeholders need to support a new light rail project in the CID neighborhood. We support the expansion of the light rail system for the region, and recognize the challenges we all face trying to expand high capacity transit in a densely built environment. We understand the sense of urgency to make timely decisions, while also balancing the needs of the community and our regional economy.

All our previous comments and concerns, submitted during the West Seattle and Ballard Link Extension Draft EIS process remain relevant today. We request Sound Transit review, consider, and respond to those comments during preparation of the new draft EIS.

In addition to addressing our previously submitted comments, we request Sound Transit consider the following when preparing the new draft EIS:

Continue centering historically marginalized voices in your decision-making process. The decision to identify a preferred alternative that locates stations outside the CID has been touted as an attempt to respond to concerns raised by the CID community during the WSBLE

draft EIS process. While many questions remain about the viability of the preferred alternative, we recognize Sound Transit's work as an act of responsiveness to issues raised by the diverse perspectives in our community. It will be important to maintain a commitment to centering and elevating CID community voices through the completion of the project. As Sound Transit continues to press forward, one important way you can demonstrate commitment is to ensure membership has access to new decision makers and executives who have recently been appointed to the agency. We would welcome a direct relationship with the new Executive Director of Capital Delivery and Deputy CEO for Megaproject Delivery, and look forward to opportunities to connect with them and inform their perspectives and decision-making as this project moves forward. Direct access to decision makers within the agency helps to promote our voices and our place in our community.

Consider and acknowledge community preferences in the preferred alternative design and construction. Findings from a summer 2024 community survey of residents and workers in CID and Pioneer Square neighborhoods showed a strong preference for four important concepts related to light rail expansion. Those concepts are:

- CID and Pioneer Square residents are deeply invested long-term partners committed to the vitality, connectedness and accessibility of our neighborhoods.
- Residents appear to be willing to shoulder some inconvenience and short-term disruption of construction to reap the benefits of a well-connected transit system that best serves the neighborhood.
- When given a choice between the preferred alternative and the 4th Avenue/Midtown alternative, residents prefer 4th Avenue by an exceedingly wide margin.
- Residents and workers acknowledge that the preferred alternative will bring the possibility of development opportunities and activity to an un-activated part of the city.

Information presented at the November System Expansion Committee meeting showed the substantial risk and difficulty associated with constructing the 4th Avenue station, leaving many to conclude that the option was unlikely to be built. If the 4th Avenue station-- clearly preferred by most in CID and Pioneer Square-- is not the project to be built, then Sound Transit must show how the preferred alternative design and operation will integrate the strongest desired elements of the 4th Avenue station into the project final design.

Plan for substantial, innovative, and early mitigation. As indicated in previous comment letters and submissions, the CID has been disproportionately harmed by decades of past infrastructure projects, creating ongoing deficits in our community. Sound Transit and its partners will need to innovative in approaches to mitigation for the CID community, and should consider early mitigation measures that help the community prepare for what is to come—not

simply endure it when construction happens. Mitigation ideas should be specific and relevant, and should address impacts now and during construction. Mitigation must also address the impact of long-term transit connectivity deficits (like airport access), should they arise resulting from project design.

The SCIDPDA organization will continue to participate in the public process to shape this generational transit investment for our community and the region. We will continue to partner with Sound Transit and the City of Seattle to ensure our community needs and voices are reflected in all elements of the project. We look forward to finding ways to maintain and improve the resilience and vibrancy of our neighborhood as we collectively expand regional high-capacity transit together.

We thank Sound Transit for its continued work in our community as it develops the new draft EIS.

Sincerely,

Jared Jonson

SCIDpda Co-Executive Director

Jamie Lee

SCIDpda Co-Executive Director

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SOUTH LAKE UNION COMMUNITY COUNCIL

OUR VISION

To steward a livable, vibrant, urban neighborhood supporting a diversity of residents of all ages and incomes while driving an innovative local economy and providing rich, cultural community opportunities.

OUR VALUES

Inclusiveness | Integrity | Respect | Transparency | Impartiality

December 9, 2024

Lauren Swift
Central Corridor Environmental Manager
Sound Transit
401 South Jackson Street
Seattle, WA 98104

Draft EIS: Do not overlook TOD at SLU Station. Specific considerations.
SLUCC Supports Downtown Seattle Association letter.

Dear Ms. Swift,

We at the South Lake Union Community Council have been planning for the development of the Ballard Link Extension of ST3 for many years. We are excited for the benefits that this line will bring to the neighborhoods served along the corridor. Our particular interest is in the couplet of stations at Denny/Westlake (the Denny Station) and 7th/Harrison (the SLU Station).

In scoping the Draft EIS, we generally concur with the points raised by the Downtown Seattle Association in their comments on the planning and mitigation necessary to construct this multi-faceted project in a way that brings wins for all. With that said, there is one additional issue that we encourage you to not overlook in your planning. That is the opportunity for Transit Oriented Development (TOD) at the SLU Station location.

We understand that TOD is being planned in the early 10% design for the Denny Station and we welcome this. Our community seeks to support housing for all of our residents, particularly the low-income and workforce residents who are being displaced by the rapid development of higher-end housing units in the neighborhood. We are encouraged by this early planning at the Denny Station site. At the same time, going back to 2010 we have advocated for TOD at the SLU Station site that would likewise encourage the generation of low-income/workforce housing units to recoup what is being lost across the SLU and Uptown Triangle neighborhoods. Attached is an illustration from the 2011 Seattle City Council-recognized *South Lake Union / Uptown Triangle Mobility Plan* that envisions this opportunity on the half block bounded by Harrison St. to the north, Aurora Ave. to the east, Thomas St. to the south, and an alley to the west.

It is understood that at least half of this half-block is undeveloped Washington State department of Transportation property. The other half is a low-rise 1950s era motel property that is currently used as temporary housing under contract with the City of Seattle and King County. Further, we understand that Sound Transit is planning for both properties to be used in the staging and construction of the new SLU Station. We encourage ST to work with WSDOT and related property owners to find opportunities post-station construction to produce TOD that captures the opportunity for low-income/workforce housing, integrated access to multi-modal mobility, and uses that enhance the neighborhood. Please ensure that the scope of the Draft EIS does not overlook this need at the intersection of economic, environmental, and mobility interests.

Thank you,

Julie Holland

Julie Holland
Board President
SLU Community Council

7 CREATE HUBS FOR MODE TRANSFER

T1: THOMAS / HARRISON MOBILITY HUB

T1: Thomas/Harrison Mobility Hub -- This hub would be at the future Aurora Avenue RapidRide Station, between Harrison and Thomas Streets, where regional RapidRide service would meet local transit service. This node also connects with the Lake-to-Bay Loop trail, the Thomas Street Green Street and new east-west bike routes.

INTERIM USE ON WSDOT PROPERTY

Most of the improvements can be implemented ahead of future development; a temporary bike station could be included at the corner to help establish a "Sense of Place"

TRANSIT + TRANSPORTATION

- **A1** Enhanced pedestrian/rider amenities at RapidRide and Metro bus stops
- **A2** Designated bus lanes and priority signals
- **A3** East-west bus service on Harrison Street
- **A4** Shuttle bus stop
- **A5** Transit and community information kiosk

PEDESTRIAN + BICYCLE

- **B1** Activated building edges (cafes, shops, etc)
- **B2** Safe pedestrian crossing with special intersection paving and treatments
- **B3** Wayfinding signs
- **B4** Future transit-oriented development
- **B5** Bike station
- **B6** Thomas Street concept design & Green Street improvements
- **B7** Shared bike/vehicle lane
- **B8** Pedestrian lighting

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Neighborhood with a Sense of Community

Inclusive and diverse

Thriving Arts District

Home to Seattle Center

Great local businesses

Walk, Bike, Bus, Monorail, (and drive)

Diverse and affordable housing

Historic buildings with character

Open space for healthy living

Distinguished cultural and philanthropic organizations

December 9, 2024

Lauren Swift
Central Corridor Environmental Manager
Sound Transit
401 South Jackson Street
Seattle, WA 98104

Sent via email to lauren.swift@soundtransit.org

Dear Ms. Swift,

Thank you for the opportunity to provide comments on the Ballard Link Extension (BLE) project scoping for a new Draft Environmental Impact Statement. The Uptown Alliance is a community-led nonprofit organization that was established in 1999 with the goal of creating and maintaining a more sustainable, civil and enjoyable environment for residents, businesses and visitors. Our community also embraces, supports and helps guide new development that is helping grow Uptown into a vibrant, inclusive, active and exciting place for all.

The Uptown Urban Center is proposed to host two BLE light rail stations within our planning area. See attached map. The Seattle Center Station's preferred alternative station on Republican (and its associated west portal) are wholly within the heart of Uptown. The South Lake Union Station has half of its ridership walkshed and one entrance in the easter portion of Uptown, known as the Uptown Triangle area (from 7th to 5th and Denny to Mercer). We have followed BLE issues for many years and have appreciated the very helpful working relationship with Sound Transit staff. We are experts on the past, present and future of our neighborhood. We are here as a resource and to help advance good planning and good outcomes for all.

We are supportive of BLE's planned light rail service with improved mobility and associated smart growth for our region. We seek to better understand the impacts, interruptions and mitigations needed to maintain livability, and business vibrancy through a very lengthy construction process. The previous information in the DEIS and outreach process from Sound Transit has not adequately provided enough definition, explanation, and detail on the scope of the project and its subsequent construction impacts. We request the following topics be addressed in the new DEIS:

General:

- Sound Transit should not wait until the final EIS to propose mitigation when there is no opportunity for public comment. This is a new draft EIS and Sound Transit has advanced new preliminary engineering on the preferred alternative at both station locations in Uptown since the original DEIS. There is now more information to identify propose impacts and mitigation.
- Many stakeholders in our community have expressed confusion and say they are unsure of the extent of the project and its construction in Uptown. The DEIS needs to be more comprehensive and consolidate the information about this station. Additionally, the outreach process needs to be more thorough than in the past.
- Future outreach efforts should also always include qualified engineering team members that can speak to how program and design decisions are made and to the means and methods of construction.
- The construction of the Seattle Center/Republican Station, the tunnel transition trench, the tunnel portal will require hauling of station excavation and tunnel spoils for as long as 6+ year. That makes these impacts, in effect, permanent to the residents and property owners adjacent. ST should work with Uptown Alliance to understand and identify the economic impacts and mitigations to address those accordingly.
- Previous DEIS and ST presentation drawings, diagrams and illustrative documents did not adequately indicate, in a manner understandable to the lay person, the scope and impacts of the project. We request Sound Transit present information that is easily understandable to the public. A good example of what we are requesting is like the documents that were resented to the ST board in recent November meetings regarding the CID station options which were significantly more detailed and were more legible to the public than were used in the original DEIS. That update used public friendly 3-D visualizations showing how the project is constructed in phases and when complete. This same approach and technique must be used in the future for the Seattle Center and SLU Stations as part of the DEIS.

West Republican Street, the Tunnel Trench & Tunnel Portal

We understand that 5.5 blocks of W. Republican Street (from Queen Anne Avenue to the hillside above Elliott Avenue W.) will effectively be an open cut and cover excavation, as much as 110' deep and as wide or wider than the right of way. The extent of excavation extends well beyond the station box/platform itself and includes an open trench transition from the station to a tunnel portal on the hillside above Elliott Avenue. We also understand that the previous DEIS indicated that five north/south avenues will be closed for some time during construction. Furthermore, 1st Ave West, 2nd Ave West and 4th Ave West are proposed to be closed for multiple years of construction.

- Please ensure this information is presented in a manner understandable to the lay person, the extensiveness of this undertaking. The new DEIS should include phase visualizations similar to the recent November ST Board Illustrations for the CID.
- Mitigations to traffic and bus impacts and pedestrian/bike mobility/safety, such as connecting **all** N/S streets across the Republican Street trench should be brought forward

in the schedule as early as reasonably possible and not wait for full excavation of the trench and construction of the station. The DEIS should describe how access to events at Seattle Center will be impacted and the subsequent mitigation needed.
- Provide conceptual illustrations of the street and private property improvements when the trench is covered in this corridor and the street grid is re-established.
- See the attached PDF for more information.

Portal:

We understand that approximately 70% of the bored tunnel excavation materials will be hauled out of the west portal area in Uptown. The Portal also appears to daylight within a steep slope critical area hillside.

- Define where and how tunnel excavation soils will be stored, staged and loaded at this end of the project. Map the impacted properties and proposed mitigations. Previous DEIS work did not fully delineate potential property acquisitions or impacts at W Republican of Elliott West.
- Map haul routes and destination of excavation materials and create a schedule for the DEIS.
- Delineate the schedule and the extent of dust, noise, and traffic created and mitigated during construction.
- Identify and describe how the steep slope critical area will be stabilized and how surrounding properties will be protected.
- Create conceptual drawings showing the exposed tunnel portal face, architectural features and potential public benefits and historic/cultural/contextual references where the public might see and experience those elements.

Elliott Avenue West:

The BLE elevated guideway from the tunnel portal northward to Smith Cove/Expedia crisscrosses Elliott Ave W. several times on columns and structural “bents” straddling travel lanes.

- Coordinate the evolving design and schedule of the new Elliot West Wet Weather Station project with the conceptual BLE project components.
- Provide conceptual 3D illustrations of both projects together so the public can better understand the interrelationship and potential conflicts and impacts.

Seattle Center Station:

- The New DEIS needs to comprehensively consolidate the information about this station.
- The primary entrance for Seattle Center patrons for this station is on Republican, Previous design drawing showed a very constrained sidewalk condition. The DEIS should investigate configuring the head house to create an arrival plaza to accommodate large event surge crowds.

- Consider surge events when there is a significant spike in demand for transit service or station usage. We believe this is a significant deficiency in the DEIS and must be considered during the planning and design of a location such as Seattle Center/ Uptown station. A passenger flow/crowd management plan that identifies how crowds will disperse after large events throughout the campus and neighborhood to reach station entrances should be developed in conjunction with Seattle Center and SDOT to determine what pedestrian improvements are necessary for adequate queuing and safety so that the demands for crowd events can be met. Additionally, analysis is needed to determine the train movements to establish the capacity to load surge crowds.
- See the attached PDF for more information.

Property Takings & Acquisitions:

The Republican West station needs to have all property impacts well described and documented.

- Thoroughly map and document targeted acquisition properties and outline the key decision making and rationale process for selecting each property.
    - As you are aware, this issue is of great concern to property owners and businesses and will create a great deal of anxiety. The more information you can share the better off everyone will be. There are many small and large businesses that will be impacted and uncertainty and speculation will create havoc, so the more everyone understands early, the better.
    - Some of the larger properties include The Mediterranean Inn and SIFF Uptown. The Inn brings many visitors to the Uptown neighborhood and there is concern about the loss of revenues to small businesses afforded by this group. The SIFF Uptown Theater property is also an important cultural asset in our community, so understanding all impacts to it will be important including noise & vibration.
    - Smaller businesses are equally important and contributing factors in making this a vibrant neighborhood. Closing a small business is potentially devastating to these small business owners so the more we all understand, the better off we will all be.
    - We will also be able to use this data to work with the city as the neighborhood comprehensive plan process will be occurring at the same time we are analyzing the station impacts. This information will allow us to better plan for our future.
- Describe the process and methodology for determining fair compensation for acquired properties and mitigations to losses for existing business displaced by the BLE project.
- The DEIS should identify how, when and where Sound Transit will dispose of residual staging property and describe rationale for holding staging properties beyond construction timeframes. TOD properties should start disposition earlier to allow multi-year entitlements and permit processes to proceed in parallel with construction staging and train commissioning. Many past Sound Transit TOD properties delayed the RFP/disposition process well beyond the functional need for staging. This creates extended and likely unnecessary burdensome impacts to the community. If disposition is delayed beyond staging needs, the DEIS needs to describe mitigations to the community and adjacent property owners.
- See the attached PDF for more information.

Property Impacts (Adjacent Property, Not Acquired by Sound Transit):

For all the items above:

- Delineate how adjacent properties will maintain or lose vehicle or pedestrian access to public rights of ways during construction and subsequent mitigations.
- Delineate how and where adjacent properties will require utility access and service modifications during different stages of the construction and subsequent mitigations.
- Describe the process and methodology for determining economic losses/compensation due to lost tenancy/occupancy due to construction periods and subsequent mitigations.

Transit Oriented Development Opportunities

- Examine and provide a side-by-side analysis and visual depiction between Uptown alternatives showing the land that is anticipated to be required by Sound Transit that could be available for disposition after the project is completed.
- Uptown strongly encourages TOD housing that supports Uptown's Guiding Principles for development of a diverse range of housing types and affordability levels to meet the growing demands of families and singles, workers and retirees, local arts and culture workforce.
- Please provide graphics to show opportunities to create public plazas and pedestrian corridors to serve the neighborhood with festival streets & community gathering spaces.

South Lake Union Station

- Analize the impacts of having both this station and Seattle Center (West Republican Station) under construction at the same time. Sound Transit needs to work closely with both South Lak Union and Uptown, as well as the Seattle Center to study mitigation options and impacts north/south traffic on each side of Seattle Center between 5th Ave N and 4th Ave W. while maintaining safe pedestrian and bike access during construction.
- Harrison Street will become the primary desire line from the SLU station, the E-line Rapid Ride Bus network and the new Route 8 Bus line to Seattle Center. The DEIS should evaluate the impacts and opportunities for pedestrian improvements needed to enhance safety, livability and economic vibrancy of the corridor.
- Thomas Street pedestrian and bike improvements are nearly finished. Carefully consider interruptions and changes to this corridor during and after construction.
- Incorporate, consider and build upon the new design/construction of Memorial Stadium and the surrounding streets and associated Seattle Center improvements, which are planned to be completed prior to BLE construction.
- We have not yet seen the new tunnel geometry between the SLU station with the latest Denny North changes to the station position. The DEIS needs to evaluate and document this and describe any subsequent impacts to the Uptown and Seattle Center side of the SLU station area. We have also not seen documentation on the revised tunnel geometry

through Seattle Center. The DEIS needs to describe and examine alignment options and evaluate the impacts to Seattle Center resident organizations, The Gates Foundation and other property owners in Uptown, including noise and vibration during construction and ongoing LRT operations.

Thank you for addressing these matters in the new Draft EIS. We look forward to working with you on all these issues. We believe we can find ways to minimize negative construction impacts leading to exciting new positive transportation options in the future

Please contact our transportation chair, Matt Roewe at matt@roewe.works if you have any questions or comments.

Sincerely,

Uptown Alliance Executive Committee Members:

Rick Hooper, Board Co-Chair

Lisa Powers, Board Co-Chair

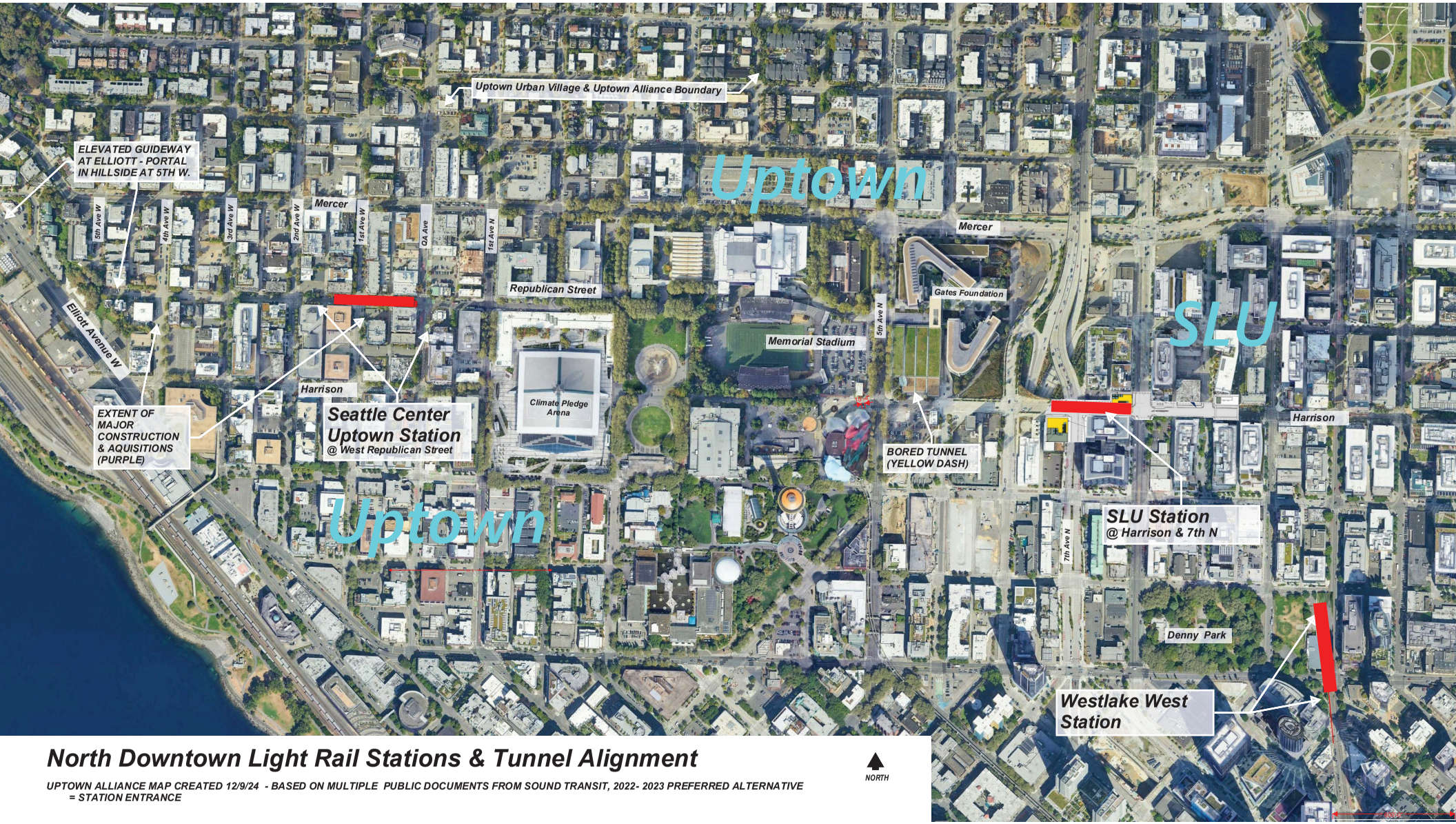
Maria Barrientos, Land Use Committee, Co-Chair

Mercedes Fernandez, Land Use Committee, Co-Chair

Matt Roewe, Transportation Committee, Chair

Cc: Dow Constantine, King County Exec., ST Board Chair, dow.constantine@kingcounty.gov
Bruce Harrell, Mayor of Seattle, bruce.harrell@seattle.gov
Adiam Emery, Deputy Mayor of Seattle Adiam.Emery@seattle.gov
Bob Kettle, Seattle City Council, Robert.kettle@seattle.gov
Dan Strauss, Seattle City Council, Dan.strauss@seattle.gov
Marshall Foster, Seattle Center Director, marshall.foster@seattle.gov
Sara Maxana, Sound Transit Program Director, SDOT, sara.maxana@seattle.gov
Julia Levitt, Strategic Advisor, Seattle Center Redevelopment, Julia.levit@seattle.gov
Jane Zalutsky, E.D. Seattle Center Foundation, jejzalutsky@seattlecenter.org

Enclosures: DEIS Diagram Mark Ups (4 pages)



North Downtown Light Rail Stations & Tunnel Alignment

NORTH

UPTOWN ALLIANCE MAP CREATED 12/9/24 - BASED ON MULTIPLE PUBLIC DOCUMENTS FROM SOUND TRANSIT, 2022- 2023 PREFERRED ALTERNATIVE

= STATION ENTRANCE

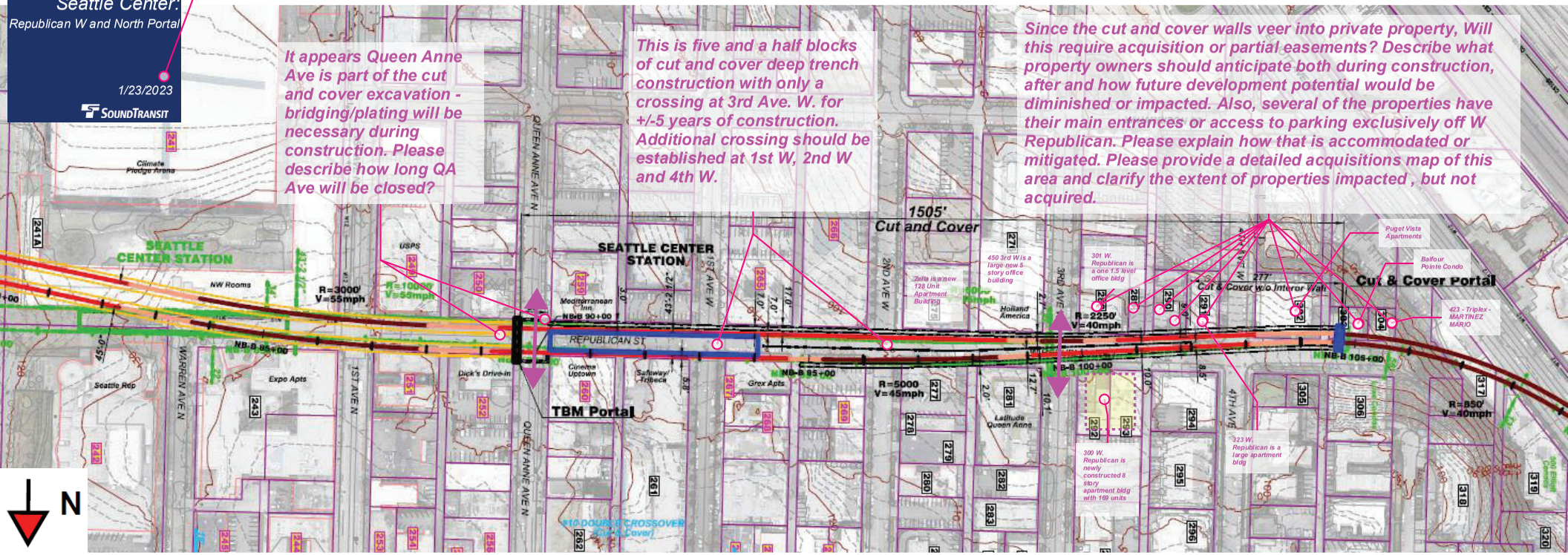
West Seattle and Ballard Link Extensions

Seattle Center:
Republican W and North Portal

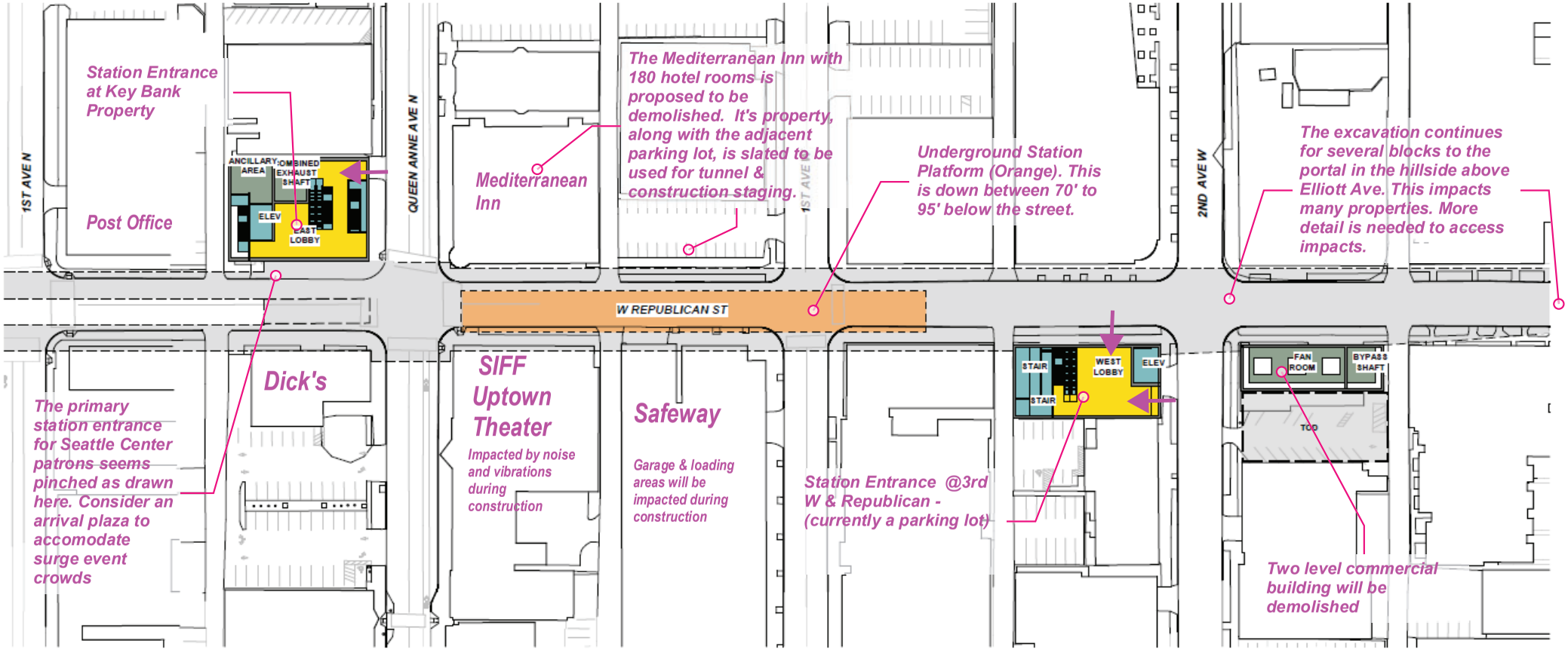
1/23/2023

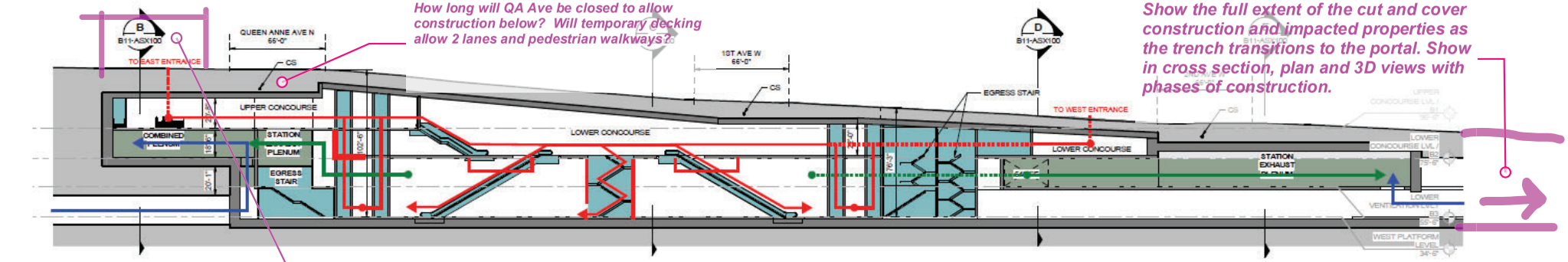
SOUNDTRANSIT

Uptown Alliance Questions and mark-up (in italic pink/red) of the following pages from the 1/23/23 ST presentation on the Republican West Station Option



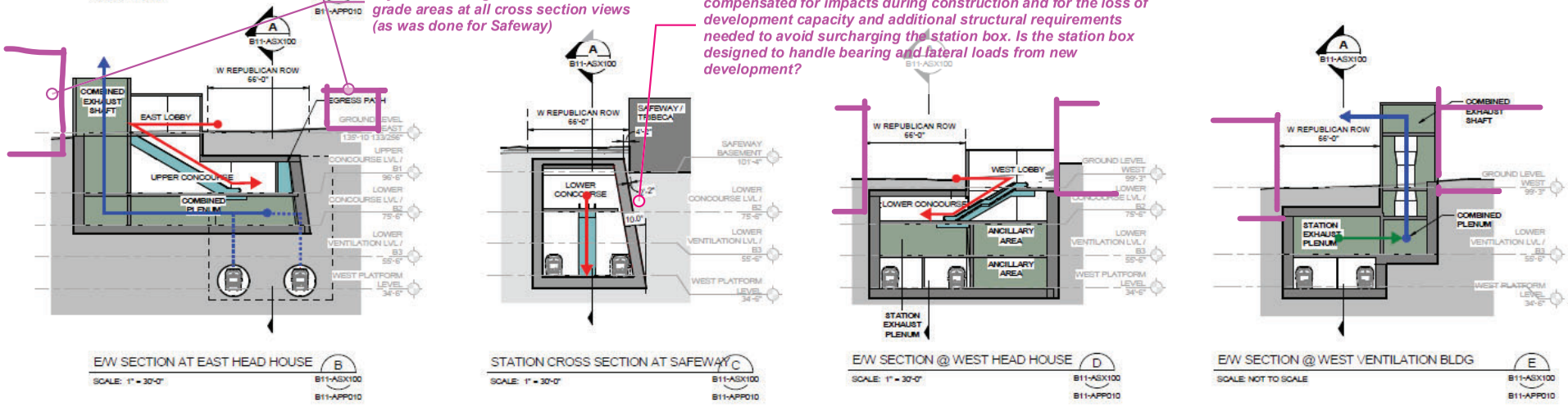
SOUNDTRANSIT


Station Entrance at Key Bank Property
Post Office
1ST AVE N
ANCILLARY AREA
COMBINED EXHAUST SHAFT
ELEV
EAST LOBBY
QUEEN ANNE AVE N
Mediterranean Inn
The Mediterranean Inn with 180 hotel rooms is proposed to be demolished. It's property, along with the adjacent parking lot, is slated to be used for tunnel & construction staging.
1ST AVE
Underground Station Platform (Orange). This is down between 70' to 95' below the street.
2ND AVE W
The excavation continues for several blocks to the portal in the hillside above Elliott Ave. This impacts many properties. More detail is needed to access impacts.
W REPUBLICAN ST
The primary station entrance for Seattle Center patrons seems pinched as drawn here. Consider an arrival plaza to accomodate surge event crowds
Dick's
SIFF Uptown Theater
Impacted by noise and vibrations during construction
Safeway
Garage & loading areas will be impacted during construction
Station Entrance @3rd W & Republican - (currently a parking lot)
STAIR
WEST LOBBY
ELEV
STAIR
FAN ROOM
BYPASS SHAFT
TOD
Two level commercial building will be demolished
BUS LOADING AREA
BUS LAYOVER
PARATRANSIT LOADING AREA
PASSENGER LOADING AREA
STATION AREA FOOTPRINT
None of these show up on the plan on this page
Note: Future public presentations should include more detail, such as pink notes added here. Also, please create these illustrations with the north orientation pointing up on the page and put a date on every page.
0 25' 50' 100' 200'
N



Show and label the relationship to adjacent buildings and their below grade areas at all cross section views (as was done for Safeway)

Will properties need to be acquired by ST where the tapered station box goes under private property? If not, how are property owners compensated for impacts during construction and for the loss of development capacity and additional structural requirements needed to avoid surcharging the station box. Is the station box designed to handle bearing and lateral loads from new development?



LEGEND

- PUBLIC CIRCULATION
- TUNNEL VENTILATION
- BYPASS VENTILATION
- STATION EXHAUST