



# City of Bellevue East Link Mitigation—Noise Fact Sheet

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| <b>Overview</b>                             | <p>The noise impacts from the East Link light rail system has been of keen interest to the Bellevue City Council and communities adjacent to the rail line. As part of the Design &amp; Mitigation Permit process, Sound Transit must assess the operational noise impacts for each segment of East Link, and install mitigation when necessary to meet regulating codes and standards.</p> <p>The Sound Transit light rail train (LRT) is required to meet the noise standards of the Federal Transit Administration (FTA), and the City of Bellevue’s noise code. This fact sheet focuses on the findings of the city’s technical noise report on Sound Transit’s compliance with the city’s noise code for East Link.</p>   |
| <b>Terms</b>                                | <p><b>A-weighted Decibel, dBA</b><br/>The human ear has a unique response to sound pressure, and is less sensitive to those sounds falling outside the speech frequency range. Sound level meters use a filtering system to approximate human perception of sound, and measurements made using this filtering system are referred to as “A weighted” and are called “dBA.”</p> <p><b>Ambient noise</b><br/>The background noise that is always present.</p>  |
| <b>Construction noise</b>                   | <p><b>Application of the code:</b><br/>The code prohibits construction noise outside of the hours of 7 a.m. to 6 p.m. Monday through Friday, and 9 a.m. to 6 p.m. on Saturdays. Construction noise is prohibited on Sundays and legal holidays.</p> <p><b>Exceptions to the code:</b><br/>Some sounds are exempt from the code in commercial or industrial zones. These sounds are exempt from residential zones between 7 a.m. to 8 p.m. on weekdays and 9 a.m. to 8 p.m. on weekends.</p> <p>Expanded hours may be authorized only if necessary to accommodate:</p> <ul style="list-style-type: none"> <li>• Transportation mitigation (such as evening haul routes)</li> <li>• Construction on schools and essential government facilities which cannot be undertaken during exempt hours</li> <li>• Site stabilization in the fall prior to the onset of winter weather</li> <li>• Emergency work</li> </ul>   |
| <b>Operational noise: residential zones</b> | <p><b>Application of the City’s noise code</b></p> <ul style="list-style-type: none"> <li>• The South Bellevue segment is the only portion of East Link which passes through a “Class A” residential zone. Under the city’s noise code in this type of zone:             <ul style="list-style-type: none"> <li>○ The maximum permissible daytime code level is <b>55 dBA</b>.</li> <li>○ Between the hours of 10:00 PM and 7:00 AM, the maximum permissible noise level is <b>45 dBA</b>.</li> </ul> </li> <li>• In South Bellevue, the city’s technical noise consultant found:             <ul style="list-style-type: none"> <li>○ Existing ambient sound levels already exceed code limits due to traffic on Bellevue Way SE, 112<sup>th</sup> Ave SE, 1-90 and 1-405.</li> </ul> </li> </ul> <p><b>Planned mitigation</b></p> <ul style="list-style-type: none"> <li>• The city’s technical noise consultant recommended the following noise mitigation:             <ul style="list-style-type: none"> <li>○ Install noise walls as planned to meet the FTA guidelines.</li> <li>○ Add additional height and length to the noise walls to meet the city noise code in residential zones, as modeled by Sound Transit.</li> </ul> </li> <li>• Installing the above mitigation ensures that the noise of the LRT is at or below the existing ambient levels and does not contribute to a perceivable increased in the noise level at the receiving properties.</li> </ul> |

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| <p><b>Operational noise: non-residential zones</b></p>        | <p><b>Application of the City’s noise code</b></p> <ul style="list-style-type: none"> <li>• The Central Bellevue and Bel Red segments of East Link pass through “Class B” and “Class C” zones, which are predominantly commercial and industrial zones with the exception of the Lake Bellevue residential area. <ul style="list-style-type: none"> <li>○ Unlike the “Class A” designation found in South Bellevue, the city’s noise code includes an exemption for certain noises in “Class B” and “C” zones.</li> <li>○ Sound Transit has raised this exemption in the Bel Red segment of East Link, and is in the process of compiling documentation to support the use of this exemption, which the city will subsequently evaluate.</li> </ul> </li> </ul> <p><b>Planned mitigation</b></p> <ul style="list-style-type: none"> <li>• The city will require new residential construction to use sound proofing to mitigate external noise sources in the Central Bellevue and Bel Red corridors. <ul style="list-style-type: none"> <li>○ Sound Transit will provide noise information to assist in setting the standards necessary to meet this goal.</li> <li>○ These same sound proofing requirements apply now in the downtown area, where residential developments are required to use construction materials that ensure adequate mitigation from traffic noise.</li> </ul> </li> <li>• Where already established residences exist in the Lake Bellevue area: <ul style="list-style-type: none"> <li>○ East Link will include a noise wall adjacent to the track to meet FTA guidelines.</li> <li>○ Additional acoustic panels will be installed along a portion of the guideway to mitigate LRT noise to at or below existing ambient levels and meet city code.</li> </ul> </li> </ul>   |
| <p><b>Additional operational noise reduction measures</b></p> | <p><b>Lessons learned from Central Link</b></p> <ul style="list-style-type: none"> <li>• Sound Transit has included a number of noise reduction measures in the East Link project based on lessons learned from Central Link. To minimize wheel squeal and mitigate the sound emanating from bells, wayside audible warning devices, and track cross overs, Sound Transit is: <ul style="list-style-type: none"> <li>○ Designing all light rail vehicles to include wheel skirts (a cover over the wheel wells) that reduce noise from the rail-wheel interface, which is the primary source of noise from operating trains.</li> <li>○ Maintaining consistent maintenance of light rail vehicles and tracks: <ul style="list-style-type: none"> <li>▪ Grind or replace worn rails to keep noise levels at projected levels.</li> <li>▪ Grind down flat spots, which are caused by hard braking and can cause increases in noise levels produced by light rail vehicles.</li> <li>▪ Train operators to identify potential wheel flats and other mechanical problems so that timely maintenance can be performed.</li> </ul> </li> <li>○ Profiling the rails to better match the wheels and thus reduce rail-wheel noise.</li> <li>○ Grinding the head of rails to a smoother surface than is required for freight rail roads.</li> <li>○ Minimizing wheel squeal by fitting all track curves, with a radius of 600-ft or less near noise sensitive receivers, with a rail lubricator to reduce the noise in the curves.</li> <li>○ Maximizing the use of ballasted track, which is quieter than paved track.</li> <li>○ Installing all switches on ballasted track or on plinths so that they can be easily replaced if found that a quieter switch type is needed at that location</li> <li>○ Reducing the noise levels of the audible warning devices at the stations during nighttime hours.</li> </ul> </li> </ul> |

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| <p><b>The FTA noise standards</b></p>         | <p>The FTA regulates noise generated from the operation of the LRT based on a threshold percentage above existing ambient noise levels:</p> <ul style="list-style-type: none"> <li>• The quieter the existing noise level, the greater percentage above ambient the sound from the LRT can be for compliance.</li> <li>• The louder the existing noise level, the lesser percentage above the ambient the sound from the LRT can be for compliance.</li> <li>• In some cases, the LRT is required to meet the existing ambient noise levels.</li> <li>• The FTA establishes the ambient sound level based on a 24 hour average and applies a 10dBA penalty to that average for nighttime noise.</li> </ul> <p>Averaging noise across a 24-hour period tends to minimize the real-world experience of adjacent residents and businesses with respect to the noise events of bells, the train itself, wheel squeal and track cross-over noise. To address these concerns:</p> <ul style="list-style-type: none"> <li>• The city has worked through the permit process to establish mitigation for these noise impacts.</li> <li>• The city retained its substantive SEPA authority to impose mitigation for impacts not identified in the environmental documents for the East Link project.</li> </ul> |
| <p><b>The City of Bellevue noise code</b></p> | <p>The Bellevue City Code Chapter 9.18 regulates noise and quantifies maximum permissible noise levels based on the use of the property where the noise is generated and the use of the receiving property.</p> <p>The city's noise code does not take into account existing ambient noise levels, but sets a threshold for sound levels received by properties in the vicinity of the noise generator. It is typically applied to actual stationary noise generation, after a building or land use is in operation.</p> <ul style="list-style-type: none"> <li>• While compliance with the noise code is cited as a condition of development permits, the actual determination of compliance and enforcement of the code occurs when the land use is underway.</li> <li>• However, the LUC Light Rail Overlay modified this typical application to require some up-front demonstration of compliance with the city's noise code as part of the Design &amp; Mitigation permit process.</li> </ul>  |