



Sound Insulation Repair and Replacement Pilot Program Update

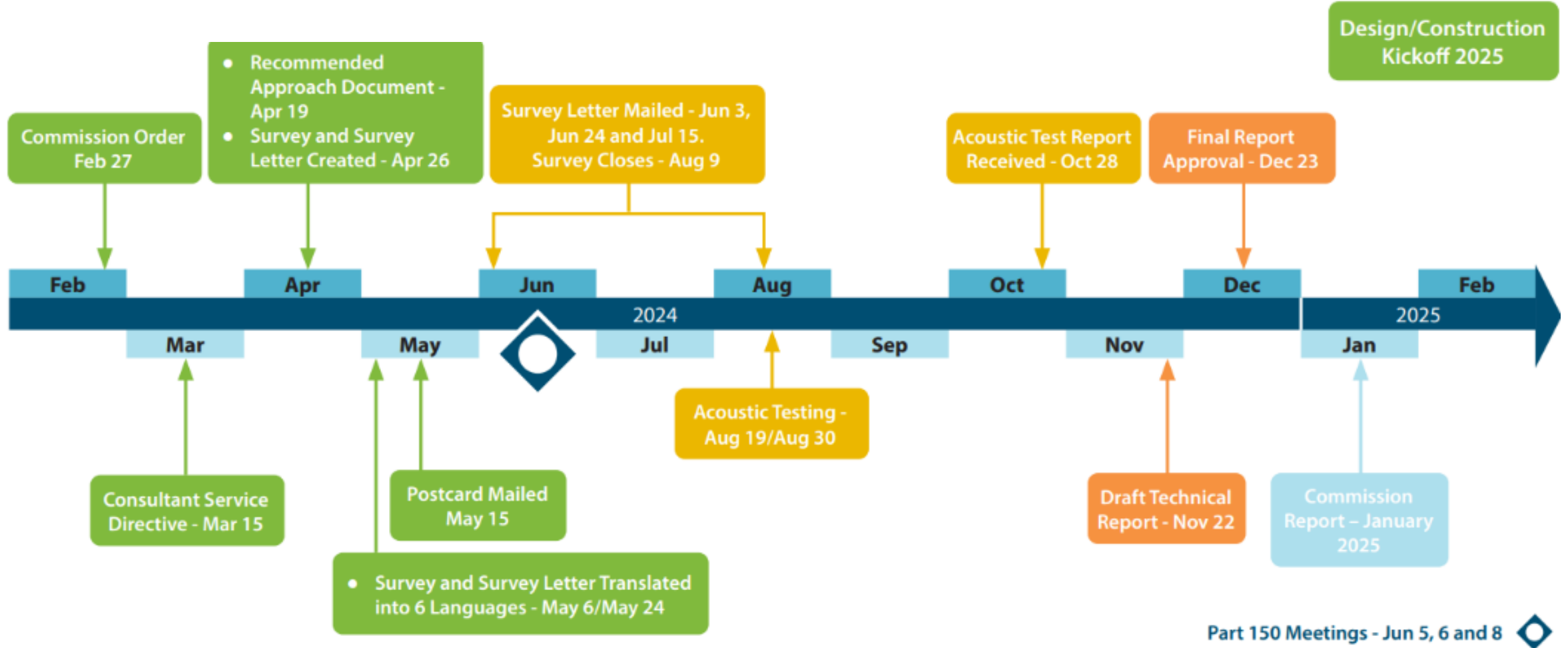
February 26, 2025



Commission Order 2024-04

- “The Port Commission hereby orders an assessment regarding the effectiveness of previously installed Port of Seattle funded noise insulation packages be conducted and concluded by the end of the year 2024. The assessment will involve extensive outreach, collection of information from property owners and analysis of that information.”
- Authorized, tax levy-funded, budget of \$6.5M with \$5M of those funds being set aside for design/construction associated with the Pilot Program

Pilot Program Schedule



Survey Overview and Results

- Designed to meet intent of Order 2024-04
- Pilot Steering Committee and Pilot Working Group composed of airport staff and consultants
- Conducted within 2014 SEA Noise Remedy Boundary
- Access to survey through unique QR code or unique URL assigned to residences' addresses
- Extensive outreach to community and stakeholders
 - Approx. 3,200 SFHs w/ pre-survey postcard and three mailings
 - Informational webpage on Port's website
 - Survey assistance availability by Port staff via email and phone
 - Information station at three public Part 150 Study meetings in June
 - Regular updates at StART Aviation Noise Working Group meetings
 - Update provided at Highline Forum meeting

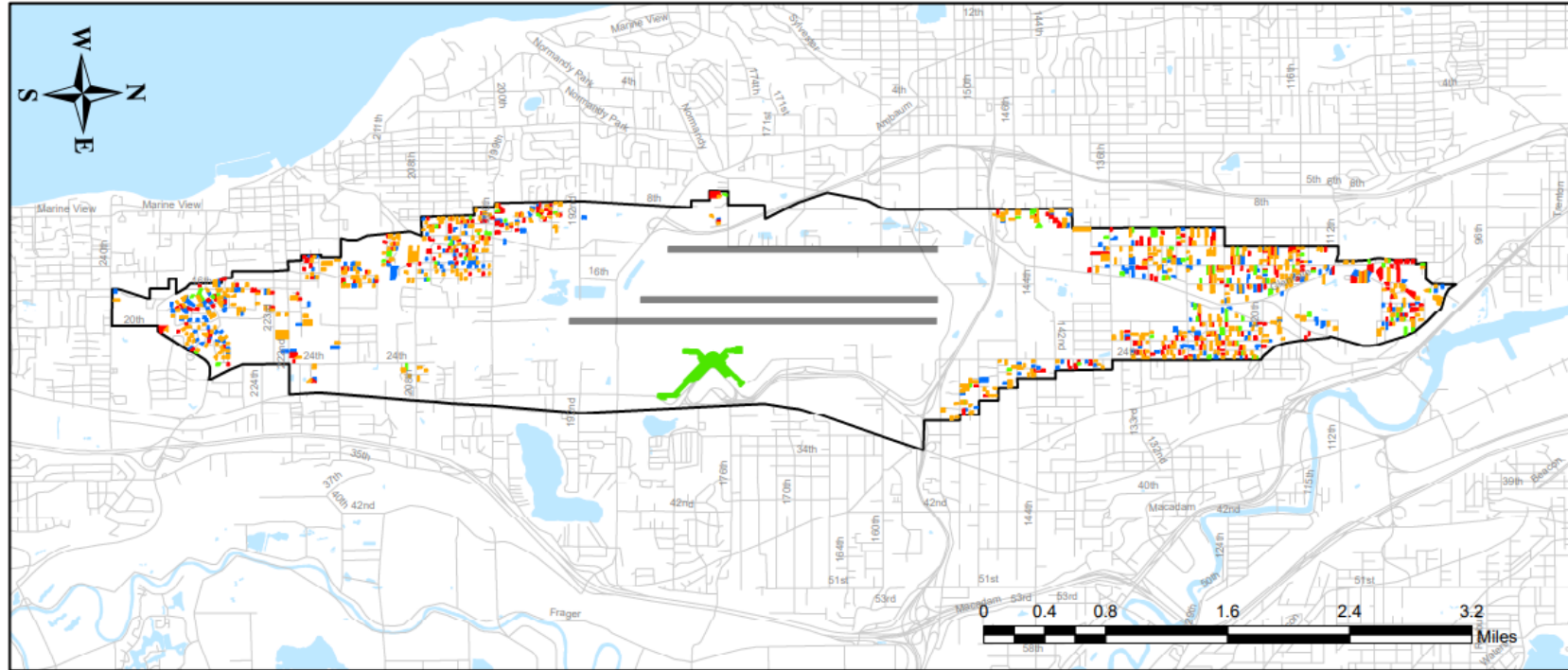
Survey Overview and Results (cont.)

- EDI integration
 - Translation of survey and mailed materials into Port's Tier 1 and Tier 2 languages (six additional languages)
 - Physical copies of survey available upon request in seven languages
 - Added questions about race/ethnicity and income
- Questions about number and types of common window/door concerns including operation and appearance from residents' perspective

Survey Overview and Results (cont.)

- Survey results
 - 1,067 responses (> 33% response rate)
 - Responses reflected variety of packages installed
 - Concerns about operation ranged from 60-75% based on product
 - Concerns about glass ranged from 50-72% based on product
- The survey data demonstrates the impacts of the overall age and design of the finished product as factors for residential concerns and existing conditions, and not the specific year or product installed

Survey Overview and Results (cont.)



Not an official map.

To determine if a home may be eligible for any sound mitigation programs contact the Noise Programs office at 206-787-5393

Legend

- Other
- Milgard
- Alpine
- CDI/Peerless/Devac

Survey Overview and Results (cont.)

Comparison of Sound Insulation Packages and Response Distribution by Manufacturer

Manufacturer	Number of Survey Responses	Percentage of Survey Responses	Percent of Insulation Packages (Based on 3,200)
Alpine STC35	30	2.8%	2.0%
Alpine STC44	225	21.1%	21.4%
CDI STC44	43	4.0%	4.3%
Milgard	85	8.0%	9.6%
Peerless/DeVac	167	15.7%	14.8%
Storm Only	36	3.4%	2.6%
Other/Unknown	481	45.1%	45.3%
Total	1,067	100.0%	100.0%

SOURCE: Port of Seattle, 2024; ESA, 2024.

Year of Sound Insulation Package by Response

Year of Sound Insulation Install	Count	Percentage of Survey Results	Percentage of Insulation Packages (Based on 3,200)
Pre-1993	228	21.4%	19.4%
1994	119	11.2%	11.4%
1995	184	17.2%	17.1%
1996	149	14.0%	13.3%
1997	96	9.0%	9.7%
1998-1999	148	13.9%	14.3%
2000-2003	123	11.5%	11.3%
Post 2003	20	1.9%	3.5%
Total	1,067	100.0%	100.00%

SOURCE: Port of Seattle, 2024; ESA, 2024.

Field Assessment and Acoustic Testing

- Third-party consultants conducted field assessment and acoustic testing concurrently at 30 homes over a two-week period beginning on August 19, 2024
- The 30 homes that were selected reflected distribution of manufacturers by year for sound insulation packages installed between 1986 - 2014

Field Assessment Overview and Results

- Survey responses and existing product conditions validated by field assessment
 - Operational issues included opening/closing, locking, being out of square/out of tracks
 - Appearance issues included debris between windowpanes, condensation between glass, window trim deterioration, potential seal failures, and potential mold
- Port sponsored installations did not include entry doors
- Storm doors and secondary sliding doors were sometimes installed
- Ventilation included installation of non-mechanical vents, or fresh air intakes

Field Assessment Overview and Results (cont.)

- Installation and maintenance issues
 - Screws set at the bottom of the sill may promote water damage
 - Window trims and weepholes being caulked over
- Design of the window products is a significant factor in longevity, repairability, and links to reported concerns from the community
 - Design and location of weepholes
 - Inability to clean in between both:
 - Fixed picture windows with non-removeable storm panels
 - Windows with moving sashes

Acoustic Testing Overview and Results

- Acoustic testing followed guidelines in Acoustic Testing Plan (ATP) for SEA which was approved by FAA in 2017
- Each home is located at an exterior Day Night Average Sound Level (DNL) noise contour within the 2014 SEA Noise Remedy Boundary (e.g. **70dB DNL**)
- Loudspeaker located outside of the home generates noise for the interior DNL measurements
 - Noise measured inside the room and outside of the home at the façade to calculate a Noise Level Reduction (NLR) (e.g. **27dB**) for each habitable room

Acoustic Testing Overview and Results



Acoustic Testing Overview and Results

- The calculated interior DNL is the noise metric used to determine eligibility for sound insulation
 - e.g.: **Exterior DNL (70dB) – NLR (27dB) = Interior DNL of room (43dB)**
- To be eligible for insulation, the average interior DNL of each habitable room must be greater than, or equal to, 45dB DNL
- All 30 homes tested below FAA's 45dB DNL interior noise threshold and are compatible with FAA's residential noise thresholds
 - Testing included five homes Pre-1993 for which FAA has a program to re-insulate homes that test greater than, or equal to, 45dB DNL interior and existing sound insulation package was installed prior to January 1, 1993

Expected Useful Life Studies

- Port staff and their consultants conducted research and gathered information from four studies regarding the Expected Useful Life (EUL) of windows and doors for homes
 - EUL is the estimated duration that a building material or component will perform its intended function under normal conditions before needing significant repair or replacement
 - The studies addressed the EUL of aluminum window frames (15-20 yrs), vinyl window frames (20-30 yrs), glass/glazing (8-20 yrs), storm/window screens (10-15 yrs), storm doors (7-10 yrs), sliding doors (20 yrs), and entry door slabs (20-30 yrs)
 - EULs focus on structural integrity, functionality, and aesthetics. They do not account for the acoustic performance of the products, which can vary significantly based on material composition, installation methods, and environmental factors

Assessment Key Findings

- Aging, design, and installation issues are primary factors for resident-noted concerns
 - 99% of products installed prior to 2014 are past their expected useful life and most are beyond warranty period
- Lack of available replacement parts limits residents' ability to maintain and/or perform regular care
- All homes (including five Pre-1993) tested under 45dB DNL interior
 - Despite operational and appearance concerns, all homes' sound insulation packages are acoustically “effective”

Next Steps

- Implementation Workshops
- Design/Construction Phase