PROJECT PROFILE

Sound Transit East Link Extension: The Crosslake Connection

2026 Inductee, Transportation Choices Coalition Hall of Fame



SERVICES
LRT feasibility studies, seismic retrofit and track bridge design

LOCATION
Seattle, WA

OWNER
Sound Transit / WSDOT

PASSENGER SERVICE
Opened March 28, 2026

PROJECT OVERVIEW

The Crosslake Connection spans Lake Washington along the Interstate 90 corridor, linking the 2 Line with Sound Transit's north–south 1 Line at the International District/Chinatown Station. This new connection creates a fully integrated regional light rail system and includes new stations at Mercer Island and Judkins Park, expanding access to fast, reliable region-wide transit.

The project required retrofit and modification to accommodate new track and systems on the existing Homer M. Hadley Memorial Floating Bridge (WSDOT I-90), a structure supported by 18 floating pontoons. Cars cross floating structures easily, but running light rail trains at 55 mph required specialized solutions to prevent derailment. Engineers had to find a way for trains to move safely between fixed, land-based track and a bridge that moves in multiple directions with changing lake levels, traffic loads, wind and waves.

Structural Integrity Associates, Inc. (formerly SC Solutions) was retained by WSDOT and the Washington Legislative Transportation Committee to lead an independent review team to study the feasibility of operating and maintaining LRT on the I-90 Homer M. Hadley Floating Bridge and to provide analytical support.

INDEPENDENT REVIEW TEAM (IRT)

- **Consensus and legislative briefings:** Led discussions between Sound Transit and WSDOT to plan and implement operations and maintenance procedures, including presentations to the Joint Transportation Committee of the Washington State Legislature.
- **Expert review panel:** Developed and managed an IRT of industry and discipline experts to study the impacts of adding LRT to the floating bridge, including design criteria, seismic vulnerability of bridges and tunnels, constructability, track bridge/expansion joint design, wind and storm effects, passenger comfort, operations and maintenance agreements, and stray current mitigation.
- **Feasibility studies:** Performed independent studies to evaluate and confirm the feasibility of adding LRT to the floating bridge, identifying critical design elements and performing initial technical studies to minimize future risk.

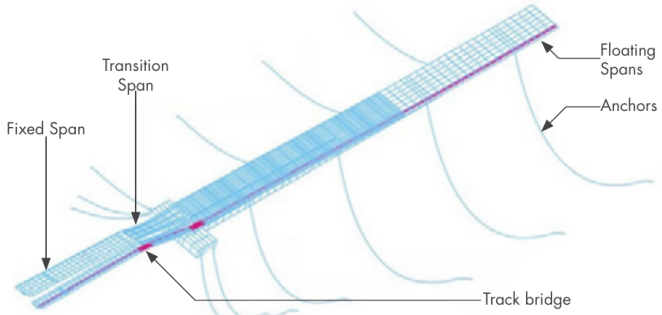
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ANALYTICAL SUPPORT: THE TRACK BRIDGE

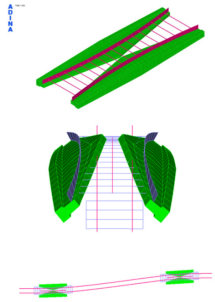
The track bridge is the first-of-its-kind system that makes light rail on a floating bridge possible. Installed at each end of the transition span, it spans the bridge expansion joints and smooths the track alignment as the floating structure moves. The rail is carried on bearer bars that rotate about all three axes, with the largest motions about the bridge's longitudinal axis. Thirty-four friction-pendulum isolation bearings keep the bearer bars fully supported through every combination of yaw, pitch and roll, allowing the rail profile to change without significant deformation in the rail.

SIA performed advanced analysis to develop and validate the CESURA track bridge system and to evaluate track bridge options for passenger comfort:

- **Global bridge model:** Built a detailed 3D finite element model of the floating bridge and its structural components, including a fixed span, floating span and transition span, both track bridge structures, the anchors, and nonlinear springs that simulate variable buoyancy forces.
- **Bearing model:** Modeled the double friction-pendulum isolation bearings at the heart of the track bridge with discrete finite elements.
- **Construction sequence:** Analyzed the construction sequence to confirm the rails would not be overstressed by gravity loads and the resulting bridge deformations.
- **Vehicle-track-structure interaction:** Modeled the light rail vehicle's suspension and ran it dynamically over the rail through a range of storm conditions and train speeds, using nonlinear dynamic time-history analysis to evaluate ride quality and derailment potential. The vehicle model was validated against full-scale testing.



SIA's 3D finite element model of the I-90 Homer M. Hadley Memorial Bridge, including both track bridges



CESURA track bridge model

ADDITIONAL ANALYTICAL SUPPORT

- **East and West Approaches:** Seismic vulnerability study, independent seismic design validation for compliance with Sound Transit and WSDOT criteria, and parametric studies to optimize the seismic retrofit design.
- **Track Attachment Design:** Parametric studies for design of the track attachment on the floating bridge, in coordination with subject experts and laboratory experimental data.

OUTCOME

Passenger service on the Crosslake Connection opened March 28, 2026, making the I-90 floating bridge home to a world-first track bridge system. In 2026, the project was inducted into the Transportation Choices Coalition Hall of Fame. SIA is proud to have supported the project team from early feasibility through final design validation.

A MESSAGE TO THE PROJECT TEAM

Following the Hall of Fame announcement, John Sleavin of Sound Transit shared this message with the full Crosslake Connection design team, a collaboration of many firms that included SIA:

"It has been an honor to have supported this team through various parts of the project, and seeing the project team being honored in this way is truly an emotional moment. This recognition reflects not only your individual contributions, but also the collective accomplishment of the remarkable team that delivered a once-in-a-generation transportation project for our region, changing it forever. I am grateful for everything you did to help make the Crosslake Connection happen."

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