



# Collaborative Delivery



**HATCH**



# EAST LINK SOUTH BELLEVUE TO OVERLAKE TRANSIT CENTER (OTC)

## SOUND TRANSIT

**LOCATION**  
Seattle, WA

**NAME OF CLIENT**  
Sound Transit

**PROJECT TIMELINE**  
January 2012 - December 2023

**PROJECT COST**  
US \$1,000,000,000

### PROJECT OVERVIEW

A key element of Sound Transit's long-range planning, the East Link project, extends the present Seattle area light rail system from downtown Seattle to the East King County communities of Mercer Island, Bellevue, and Redmond, some of the Puget Sound region's fastest growing economic and residential centers. The South Bellevue to Overlake Transit Center portion of East Link is seven miles long and includes one tunnel and station in downtown Bellevue, four at-grade stations, one retained cut station, and two elevated stations.

### SUSTAINABILITY

Sustainability tasks included:

- + Conducting two half-day consultant-led forums with Sound Transit and consultant staff to recommend the sustainable design features that will be prioritized for the project
- + Preparing a brief memo detailing the prioritized design features for Sound Transit review and acceptance prior to proceeding with the Sustainability Report
- + Drafting and Finalizing Sustainability Checklists at 60% and 90%
- + Drafting and Finalizing Sustainability Report at 60% and 90%
- + Incorporating selected sustainable strategies into Contract Documents at 60%, 90%, 100%, IFB, and IFC

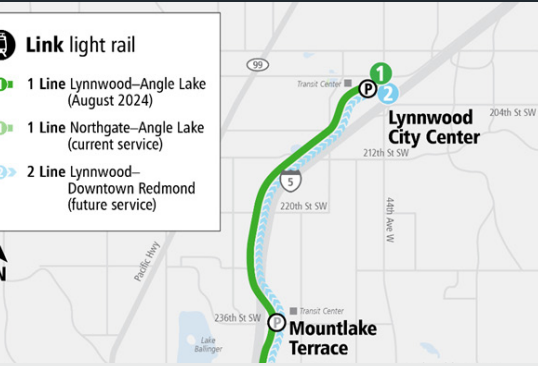
### SCOPE OF SERVICES

Hatch was a member of the H-J-H Final Design Partners Joint Venture, which was selected by Sound Transit to deliver the final design for the \$1.8 billion, seven-mile-long South Bellevue to Overlake Transit Center portion of East Link. The Joint Venture's scope of work included all final civil, structural, architectural, mechanical and electrical design to build the segment from South Bellevue to the Overlake Transit Center adjacent to the Microsoft Corporate Campus in Redmond. Specific Hatch tasks included:

- + Tunnel Design of the Downtown Bellevue Segment
- + Structural Discipline Lead
- + Design and Project Integration Lead
- + Early work cost estimating
- + CADD management
- + Detail design for civil, structural, tunnel and mechanical infrastructure

### PROJECT HIGHLIGHTS

- + Seven miles of double-track light rail transit line
- + One tunnel and station in downtown Bellevue
- + Four at-grade stations
- + One retained cut station
- + Two elevated stations
- + Parking facilities that include two parking structures and one surface lot
- + Approximately 11,000 feet of retained cuts
- + A 2,300 foot cut-and-cover tunnel
- + Approximately 2,100 feet of retained fill
- + 8,900 feet of at grade line including storage track
- + Approximately 16,200 feet of aerial guideway
- + Long span bridge crossings over Interstate 90 and Interstate 405
- + A creek relocation and park
- + Wetlands construction



## LYNWOOD LINK SYSTEMS SOUND TRANSIT

### LOCATION

Seattle, WA

### NAME OF CLIENT

Sound Transit

### PROJECT TIMELINE

2016 - 2025

### PROJECT COST

US \$2.9 Billion

## PROJECT OVERVIEW

The Lynnwood Link project extends light rail from Northgate into Snohomish County, serving four stations, Shoreline South/148<sup>th</sup>, Shoreline North/185<sup>th</sup>, Mountlake Terrace and Lynnwood City Center. Upon opening on Aug. 30, 2024, riders will enjoy fast, frequent and reliable service between south Snohomish County and the University of Washington, downtown Seattle, the Eastside, Sea-Tac Airport and more.

Sound Transit's Lynnwood Link Extension expands on the existing Central, University, and Northgate Link Light Rail by adding 8.5 miles of double track and 4 stations, with an additional In Fill station to be added in 2025, starting from the Northgate Station and extending north along I-5 through Seattle into shoreline, Mountlake, and terminating at Lynnwood City Center in Lynnwood. The project included a combination of at-grade, retained cut, and aerial infrastructure.

## SCOPE OF SERVICES

Hatch was responsible for the systems design elements including traction power substation and distribution systems, OCS, signals, and communications for Lynnwood Link's Final Design. The Lynnwood Link traction electrification system includes six 3MW traction power substations with auto-tensioned catenary OCS extending throughout the alignment. The design also included substation grounding and bonding, ground grid design, and OCS pole grounding. Hatch provided the Train Control design for the alignment for the safe and controlled operation of the light rail vehicles along the alignment which include five signal bungalows, cab signaling, and wayside signal and track switch hardware. Hatch's design Team also provided all of the design for all communications design elements which included network access layer (communications rooms to end devices), telephone, radio, closed-circuit television, public address, variable message signs and access control for all rooms and public spaces at stations. Hatch provided engineering and design services for:

- + Traction electrification substations, distribution, and overhead contact system
- + Train control and wayside signal coordination
- + Communications network fiber-optic backbone
- + Passenger communications
- + Radio communications
- + Supervisory control and data acquisition (SCADA) system
- + Link Control Center corridor addition
- + Corrosion-protection systems engineering for utilities and structures

Hatch is currently providing the design support during construction services for Lynnwood Link.

## PROJECT HIGHLIGHTS

- + 8.5 miles of double-track light rail extending from Northgate to Lynnwood City Center
- + Four new light rail stations in Shoreline, Mountlake Terrace, and Lynnwood, with one future infill station
- + Combination of at-grade, retained cut, and aerial guideway infrastructure along the I-5 corridor
- + Six 3-MW traction power substations supporting the full alignment
- + Auto-tensioned overhead contact system (OCS) installed corridor-wide
- + Traction power distribution, grounding, bonding, and substation ground grid systems



## EAST HARBOUR TRANSIT HUB (EHTH) METROLINX

### LOCATION

Toronto, Ontario, Canada

### NAME OF CLIENT

Metrolinx

### PROJECT TIMELINE

January 2015 - December 2028

### PROJECT COST

US \$800,000,000

### PROJECT OVERVIEW

The East Harbour Transit Hub (EHTH) is part of a new series of SmartTrack Stations for the Greater Toronto Region being delivered by Metrolinx (MX). The station site is located along the Lakeshore East rail corridor south of the intersection of Eastern Avenue and Broadview Avenue in Toronto, Ontario. EHTH will be a transfer station for the GO Lakeshore East corridor, the GO Stouffville corridor, and the Ontario Line (OL) subway line.

East Harbour will feature over 13 million square feet of diverse commercial space, residential space, retail, food, cultural uses, and outdoor space. The East Harbour Transit Hub is the multi-modal transit gateway to the Transit Oriented Development (TOD). Working for First Gulf and Cadillac Fairview, Hatch provided conceptual development engineering, project management, economics, and strategy services to support the conceptual development of the new station. The station will become the second busiest train station in the GO network (after Toronto's Union Station), served by GO Rail, Ontario Line subway and future streetcar/light rail system and TTC bus network. As part of the developer team, Hatch's involvement has been a key component to recognizing and unlocking the benefits at East Harbour, but also to obtaining multi-level stakeholder buy-in and consent and overall advancement of this TOC project.

Hatch has continued as the detailed design consultant as part of the Alliance team in the role of Design Non-owner Participant and overall Engineer/Architect of Record for the station.

### SCOPE OF SERVICES

The objective of this study and report of the development phase was to assess the ground-borne vibration levels resulting from the auguring of caissons and the demolition of the existing EAB, along with their potential impacts on existing utilities located along Eastern Avenue underneath the EAB. The calculated vibration levels resulting from both the caisson construction and demolition activities will be compared to applicable regulatory and industrial limits. This evaluation will determine the impact of the calculated vibration levels on the integrity of the utilities and establish the allowable weight that can be dropped on the pavement and sidewalks during the demolition process. The analysis will prioritize the vibration levels associated with most stringent utilities and the nearest utility within each category, including:

- + Hydro ducts/conduits (including cables).
- + Gas mains.
- + Watermains and sewers.



The remainder of the project had the following scope:

### Engineering and Architecture

- + Overall project management
- + Architectural concept level & detailed design
- + Detail engineering: Structural, Electrical,
- + Mechanical & Communications, Site Development & Utilities, Track
- + Environmental site assessments & gap analysis
- + Construction planning, scheduling, & staging

### Urban Development and Planning

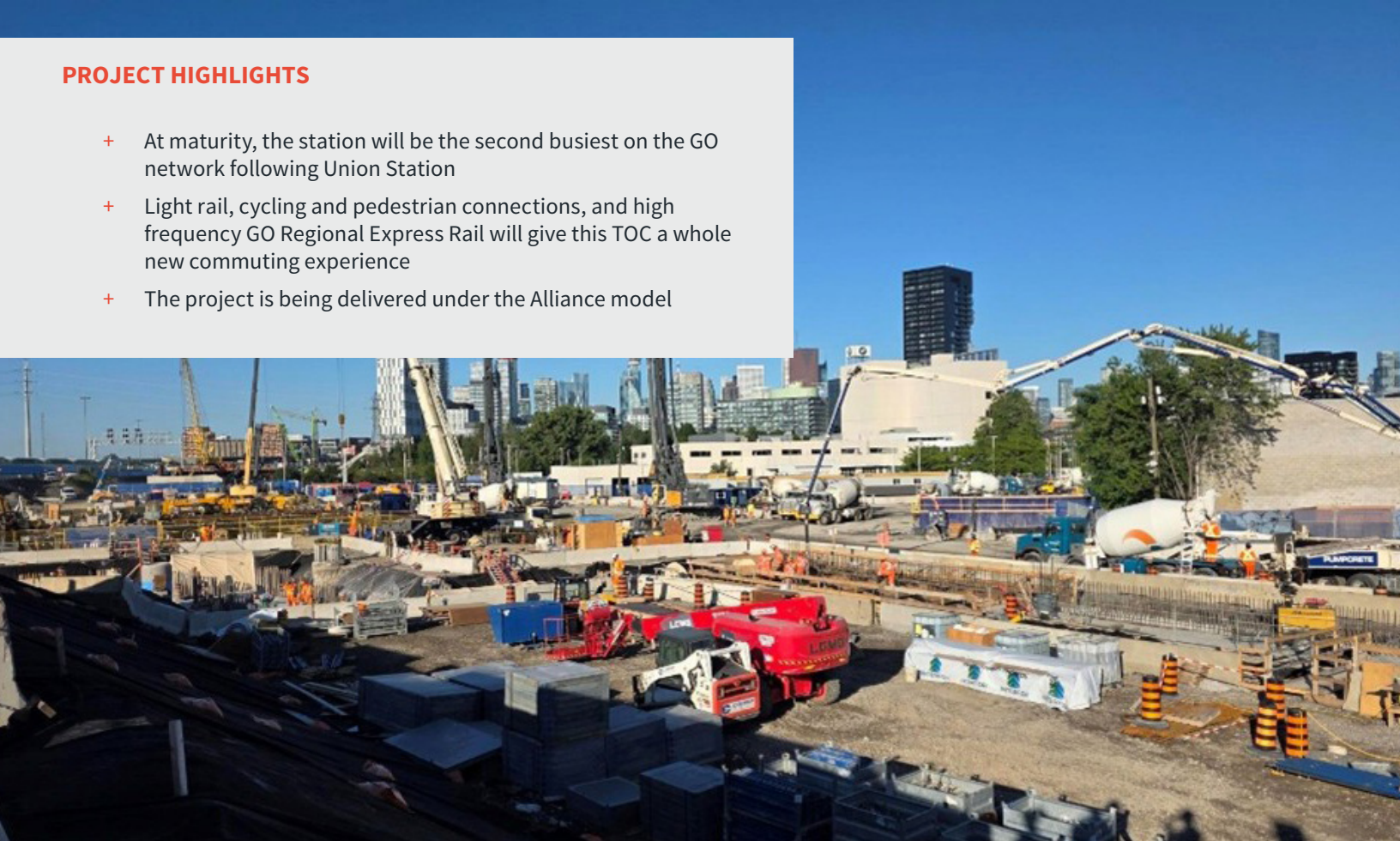
- + Analysis and consideration of passenger flows, pedestrian and cycling movements, and overall integration and connectivity with commercial development, transit and community
- + Passenger demand and revenue forecasts
- + Preliminary consideration of station access issues
- + Strategic advice to improve the station's design and advance planning proactively and effectively, integrated with the adjacent buildings and Master Plan
- + Rail safety strategy and risk assessment/mitigation

### Financing and Collaboration

- + Development of financial analytics for project funding and a public-private financing strategy
- + Hatch brought in depth knowledge of stakeholders and partners including all levels of government and relevant government agencies to work closely with First Gulf's, Cadillac Fairview's, and now Metrolinx's project delivery teams.

### PROJECT HIGHLIGHTS

- + At maturity, the station will be the second busiest on the GO network following Union Station
- + Light rail, cycling and pedestrian connections, and high frequency GO Regional Express Rail will give this TOC a whole new commuting experience
- + The project is being delivered under the Alliance model





# CSX HOWARD STREET TUNNEL PROJECT

## SKANSKA-FAY JOINT VENTURE

### LOCATION

Baltimore, MD

### NAME OF CLIENT

Skanska-Fay Joint Venture

### PROJECT TIMELINE

May 2022 - October 2025

### PROJECT COST

US \$200,000,000

### AWARDS

The Howard Street Tunnel Clearance Project (HST) was submitted for consideration for the 2026 Design-Build Project/Team Awards in the following category:

- + Category : Infrastructure
- + Subcategory : Transportation (other than Aviation)

### PROJECT OVERVIEW

The 125-year-old Howard Street Tunnel is centrally positioned in Baltimore City on CSX's I-95 Rail Corridor, which runs from Florida to New England and connects all the major population centers on the East Coast. Additionally, the CSX I-95 Rail Corridor through Baltimore provides a critical connection from the Port of Baltimore's Seagirt Marine Terminal Intermodal Container Transfer Facility (ICTF) to consumer markets in the Midwest.

The Howard Street Tunnel (HST) required various forms of improvement to gain clearance to enable the passage of double-stack trains (DSTs). Specifically, the Project involved a mixture of track-lowering and tunnel enlargement techniques. The 1.7-mile HST consists of three main tunnel sections based on the original construction methods: a concrete box section; a cut-and-cover section; and a mined tunnel section. The design approach optimized the profile and alignment of the track in the HST to achieve the maximum horizontal and vertical clearances within the existing structure. The Project also includes track lowering between the HST east portal and the North Avenue Bridge.

### SCOPE OF WORK

The project was delivered as Progressive Design-Build (PDB). This contract model allowed for close collaboration between the owner, contractor and designer to use preferred construction means and methods, while meeting the owner's needs. As a result, the project was able to accommodate changes to the design basis easily as the project evolved with input from CSX operations and maintenance (O&M), subcontractors and suppliers. One example was a change from steel track ties to wooden ties in detailed design; which required increased track lowering but will result in reduced O&M costs. Hatch was the prime designer for Skanska-Fay Joint Venture (SFJV). Hatch provided design services for Phase 1 (60% Design) and Phase 2 (Final Design) and engineering services during construction.

The scope of work for Hatch included the design of:

- + Geotechnical Investigations
- + Track alignment & profile design for mainline and siding tracks
- + Structural modifications to enlarge the tunnel (3D Geo-Structural Interaction Analysis)
- + Structural underpinning
- + Support of Excavation
- + Grading & Drainage
- + Tunnel Drainage
- + Drainage structures & pump station
- + Geotechnical instrumentation & monitoring
- + Approvals & Permitting
- + Utility Investigations
- + Survey (topographic + lidar survey)

Due to the nature of the existing structure, a sequential approach was taken for HST invert replacement. Hatch used 2D and 3D geo-structural interaction finite element modelling tools to estimate the existing liner stresses and assess the maximum length of invert excavation achievable, while maintaining liner stresses within allowable limits. One of the main project challenges was CSX's requirement to complete all HST invert lowering within a 9 month track outage period. Hatch worked with the contractor to develop construction sequences that would be repeatable, and efficient to meet their required <sup>24</sup>/<sub>7</sub> production schedule, while limiting the risk of tunnel movements.

During construction, Hatch worked with the contractor to revise the sequence of construction, to remove cast-in-place concrete placement from the critical path, greatly improving productivity. As a result of the close collaboration between Hatch, SFJV and CSX, invert lowering was completed ahead of schedule and the enlarged HST was turned over to CSX more than one month ahead of schedule.

## PROJECT HIGHLIGHTS

Key challenges to the completion of the project included:

- + The tunnel's age, limited documentation, and complex geometry.
- + Achieving vertical clearance without compromising structural integrity.
- + Working beneath the MTA Light Rail and above the Metro Subway, with utilities crossing over and under the tunnel.
- + Managing groundwater and ground movement in a constrained urban setting.
- + Confined access requires a single, efficiently sequenced work front.
- + Minimizing disruption to CSXT's 20,000-mile network while performing major reconstruction.

The team met these challenges through the implementation of the following solutions:

**Progressive Design-Build Collaboration:** The PDB model enabled early alignment on scope, cost, and risk. Phase 1 investigations and design development created shared certainty, allowing Phase 2 to proceed under a GMP. CSXT shaped incentives, penalties, and outage commitments around operational priorities, reinforcing schedule discipline.

**Innovative Engineering:** The team eliminated high-risk methods such as pressure grouting, tiebacks, and crown notching. Iterative track-profile refinements removed the need for crown notching entirely while improving track geometry and train speeds. Advanced Plaxis3D modeling defined safe excavation limits, confirmed the need for dewatering, and allowed the elimination of traditional support-of-excavation systems, accelerating production without compromising safety.

**Construction Innovations:** Track outage planning evolved from weekend closures to a 12-hour daily window and ultimately to a continuous nine-month outage. This enabled 24/7 operations, use of precast invert segments, and streamlined logistics. A purpose-built gantry improved material handling, while the temporary jacking system removed concrete placement from the critical path and nearly doubled production rates.

*The project was completed an extraordinary 20 months ahead of schedule and approximately \$93 million under budget.*



## PROJECT SAFETY

**Risk Management:** A comprehensive monitoring program—including drilled instruments, GeoLidar scanning, and precision tunnel sensors—validated modeling predictions and ensured safe progress. Logistics were optimized by delivering precast segments from the east and removing spoils to the west, maintaining a single efficient work front.

These combined strategies reduced risk, accelerated delivery, and ensured safe, high-quality construction in one of the most constrained rail environments in the country.

**Safety Management:** The project team incorporated safety into the design from the outset and implemented redundant systems to ensure continuous protection throughout construction. Temporary construction power was established using new utility feeds supported by backup generators (outside the tunnel), guaranteeing uninterrupted operation of the dewatering system. The dewatering wells were designed with two primary pumps and a third standby pump to automatically engage if either main pump failed.

To improve air quality, a bulkhead fan was installed at the East Portal to supplement the existing CSXT ventilation fan at the West end. The gantry system operated on temporary construction power and included its own backup generator to ensure clean, reliable power at all times.

A plywood walkway was installed between the gage as work advanced, providing a stable and safe walking surface for personnel. In addition, the precast invert geometry was intentionally designed to create a safe inspection path adjacent to a stopped train, allowing engineers to conduct inspections. Together, these engineered controls and redundancies created a robust safety environment that protected workers, maintained system reliability, and supported safe, continuous progress within the active rail corridor.

