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CASE STUDY: SOUND TRANSIT

Connecting more of Seattle with modern light rail

Siemens Mobility partners with Sound Transit to customize its S700 LRV and create a localized experience for a major line expansion.
siemens.com/mobility



Delivering 152 LRVs will triple Sound Transit's current fleet size

The biggest transit expansion in the United States in recent years is taking place in Seattle and Central Puget Sound. A major part is growing the light rail system from 20 miles in 2016 to 62 miles in the next several years. Sound Transit, the regional transportation system, selected Siemens Mobility to manufacture the 152 light rail vehicles (LRVs) needed to expand its Link light rail system. As LRVs are delivered and line extensions completed, Link trains will be longer, run more often and connect passengers from Lynnwood to as far as Bellevue.



Sound Transit chose to partner with Siemens Mobility based on the innovative design of its proven S700 LRV, its long-term commitment to customers and its well-established manufacturing facility in Sacramento, CA. Together, Sound Transit and Siemens Mobility customized the S700 car to meet the agency's stringent requirements and passenger needs. The order for 152 S700 LRVs more than triples Sound Transit's existing fleet of 62 LRVs.

Successful launch

The customized S700 LRV was a crowd pleaser when it was unveiled in Seattle in June 2019. Each of the LRV's 20 major systems was reviewed in person and in detail during the collaborative design process conducted by the Sound Transit team and Siemens Mobility engineers. Any necessary corrections or modifications were made along the way as the process progressed.

Modern features

The S700 is the latest design from Siemens Mobility. Its advancements provide many benefits over Sound Transit's original fleet of 62 vehicles from another manufacturer. While the S700 is the same length as the existing cars, its up-to-date features make it brighter and roomier. The windows are larger and curve inward at the top. The partitions between the S700's three cars are slimmer and made of glass from top to bottom. The three-module vehicle also has a wider aisle in the center car – the C car – that makes it easier to get from car A on one end of the LRV to car B on the other.

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Siemens Mobility engineers and our Sound Transit team brought an incredibly high level of dedication to delivering the best product that we can for the riders in Puget Sound.

Tracy Reed
Executive Project Director
Sound Transit LRV Fleet Expansion Project

The S700 meets all ADA accessibility requirements while providing more room for passengers, wheelchairs and bicycles. The bicycle/luggage area can store up to four bicycles in each vehicle, with hooks staggered to support different bike lengths. The wheelchair area includes three fold-down seats to maximize space and flexibility. All S700 seats are slightly thinner and have more legroom. There's also more under-seat storage for luggage because the S700 has fewer struts than the original fleet's cars. The S700's C car also uses longitudinal seating instead of transverse seating to make the aisle wider. Capacity varies from about 70 people if everyone is seated to as much as 200 to 250 people if everyone is standing.

Visual cues and an advanced passenger information system in the S700 also enhance the rider's experience. There are LED light strips on the four doors on each side of the vehicle that indicate whether the doors are opening soon/closing soon or already opened/closed. The light strips are tied to audio chimes and effectively get people to squeeze in to prevent door blocking. Double-sided passenger information screens above the doors display the next three stations and can be customized for rider alerts. The line map above the door also includes new pictograms.

Power infrastructure

In 2018, Siemens Mobility was selected to provide the power infrastructure for Sound Transit's latest LRV expansion, the Northgate and East Link lines. Siemens Mobility supplied 13 traction power substations (TPSS), two medium voltage substations (MVSS), and one cross passage tunnel tie station on the Northgate and East Link, and then fully integrated these additions into the existing infrastructure. It also upgraded one existing substation supplied by Siemens in 2008.

Unique challenges

Years ago, Sound Transit designed its Link system for 1,500-volt power from the overhead catenary line to the car – double the typical North American voltage for light rail. This higher voltage reduces the number of substations needed and assures reliable power to the relatively fast trains, according to Sound Transit's executive project director Reed.



Customizing the S700 to be able to use 1,500 volts was one of the major changes to the LRV design.

In Seattle, Siemens Mobility also customized the S700 to eliminate ground vibrations as the LRV goes over the rail near buildings that house operations sensitive to them. This was particularly important for the new line that runs past the University of Washington, which has research labs that can be adversely affected by ground vibrations.

Ongoing expansion and support

Once final modifications were completed and production reached a steady state, Siemens Mobility began delivering one car a week. As construction was completed and new LRVs were brought into revenue service, Sound Transit began opening new light rail lines in September 2021.

Siemens Mobility is well known for providing customer support long after the two-year warranty is over for each LRV in an order. Its customer service team is always ready to provide spare parts, tools, test equipment or other support to help transit agency staff do their own maintenance. If needed, its team can also performance maintenance services.