MINNEAPOLIS/ST. PAUL, MINNESOTA

S700 Low-Floor Light Rail Vehicle

The Twin Cities opened their second light rail project with a base fleet of 59 Siemens Mobility S70 vehicles running on 11 miles of track and linking downtown St. Paul and downtown Minneapolis. The new line added stops at the University of Minnesota and the State Capital as well as connecting with the Hiawatha line, serving the Mall of America and Target Field. And in 2015, an additional five S70 vehicles were ordered.

In 2018 Siemens Mobility introduced the latest innovation in low-floor light rail technology – the S700. Updating the 15-year-old S70 platform, the new and improved modern design of Siemens Mobility's low-floor light rail vehicle (LRV) has a new name and a new passenger experience. The S700 brand will be applied to the Twin Cities newest contract of 27 light rail vehicles.

A steel carbody construction, fully bi-directional, double articulated, low-floor vehicle, ideal for street-level operation and built in North America. Each six-axle light rail vehicle is equipped with two power trucks (one under each end) and a non-powered center truck.

The interior of the new S700 will maintain the many proven and reliable aspects of the S70. The technological innovations throughout the new vehicle design and an open low-floor configuration make it one of the most accessible vehicles of its kind in today's market.

Performance and Capacity

Maximum operational speed	55 mph	88 km/h
Maximum allowable speed	59 mph	95 km/h
Service acceleration and deceleration	3.0 mphps	1.34 m/s^2
Emergency braking rate	5.0 mphps	2.2 m/s^2
Passenger capacity	61 seats Approx. 235 total passengers @ 6 p/m^2 4 wheelchair spaces and 2 bicycle racks	
Maximum operational gradient	7%	
Motor power rating	174 hp x 4	130 kW x 4
Catenary supply voltage	750 Vdc	

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The end-to-end low-floor access for all passengers including those in the ADA community and better sightlines for security allows for noticeably improved passenger flow and comfort, safety and efficiency.

Each LRV is equipped with eight wide opening sliding plug doors all located in the low-floor area, with four to each side of the vehicle. The vehicle is also equipped with four designated wheelchair spaces allowing for priority seating to disabled passengers and hydraulic height control system to permit level boarding and exiting of the vehicle. And to accommodate Minneapolis' bicycle population, this S700 incorporates one bicycle rack located by the flip seats at each end of the vehicle. The door spacing has been optimized to allow for greater passenger flow entering and exiting the vehicle, which ultimately decreases the station dwell times.

To combat the extreme winter conditions in Minneapolis, the S700 features improved sidewall heaters in the passenger area and increased thermal insulation throughout the vehicle. It also features new, full-width, removable steel snow plows at each cab end of the light rail vehicle. The new design allows for full functionality of the coupler and anticlimbers without any impediment to the normal operation. To maximize passenger comfort, each vehicle is also equipped with two roof-mounted HVAC units per LRV.

Each LRV is electrically powered from an overhead catenary system (OCS) and for Minneapolis operates at speeds up to 55 mph, carrying close to 235 passengers in each vehicle with the ability to operate in multiple vehicle consists (up to four). These light rail vehicles remove automobiles off the road, in turn helping cities decrease their CO2 emissions.

Vehicle Dimensions and Weight

Length over coupler	94.3 ft	28742 mm
Width	8.7 ft	2650 mm
Height with pantograph (locked down)	12.7 ft	3870 mm
Maximum pantograph height	up to 23 ft	7010 mm
Vehicle empty weight	102500 lbs (AW0)	46500 kg
High-floor section above TOR	2.2 ft (with 1 step plus slight ramp)	670 mm
Low-floor section above TOR	1.2 ft (threshold) 1.3 ft (center)	356 mm (threshold) 396 mm (center)
Minimum turning radius	82 ft	25 m
Vertical curve, crest	820 ft	250 m
Vertical curve, sag	1150 ft	350 m
Track gauge	4.7 ft	1435 mm
Wheel base (power trucks) (center truck)	6.2 ft 5.9 ft	1900 mm 1800 mm

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