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S70 Low-Floor Light Rail Vehicle

Portland, Oregon

According to US Industry data Portland is cited as one the top 10 cities ranked among the best in the country for public transportation. In 1998 Portland opened its Westside light rail extension with North America's first fleet of 46 low-floor vehicles from Siemens. The success of that initial order and the increase in overall ridership over the years has prompted Portland to expand their system to nearly 60 miles of track and operate in excess of 100 light rail vehicles (LRV) Siemens has delivered over the past 20 years.

In 2013 Siemens introduced the latest edition of the 70% low-floor Siemens S70 light rail vehicles for the growing Portland system. A steel carbody construction; single operator's cab; double articulated; 70% low-floor vehicle, ideal for street-level operation and built in the USA. Each six-axle S70 light rail vehicle is equipped with two power trucks (one under each end) and a non-powered center truck.

The interior of this S70 LRV has been redesigned based on rider feedback to build a vehicle that will be more comfortable and enjoyable to ride, safer

and more efficient for the operator, and makes it easier for the maintenance team to perform service work.

The newly designed light rail vehicles feature brand-new seating arrangements that include extra foot room, better access through the center car, and additional wheelchair accessibility. The vehicle's HVAC systems now include fresh air dampers that automatically

adjust based on the number of people in the vehicle, keeping compartments more comfortable for riders and increasing the HVAC system's efficiency.

The new design all includes better site lines, more ergonomically designed main cabins, and larger displays for train operators so they are better able to monitor the vehicle's status to improve safety and efficiency.

Performance and Capacity

Maximum operational speed	55 mph	88.5 km/h
Maximum allowable speed	71.5 mph	120 km/h
Service acceleration and deceleration	3.0 mph/s	1.34 m/s ²
Emergency braking rate	4.9 mph/s	2.23 m/s ²
Passenger capacity	72 seats Approx. 243 total passengers @ 6 p/m ² 4 wheelchair spaces and 4 bicycle racks	
Maximum operational gradient	7%	
Motor power rating	174 hp x 4	130 kW x 4
Catenary supply voltage	750 Vdc	



Maintenance improvements were also made based on TriMet's feedback, including rearrangement of systems to increase access to key components on the vehicles. The diagnostic systems have also been improved to allow maintenance employees to troubleshoot and test each system from one point rather than visiting every device along the rail vehicle.

Each S70 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 door spacing has been optimized to allow for greater passenger flow entering and exiting the vehicle, which ultimately decreases the station dwell times.

In addition to the maximized passenger space and wide doorways the vehicle is also equipped with four designated wheelchair spaces allowing for priority seating to disabled passengers and doorway ramps to assist in the boarding and exiting of disabled passengers.

To accommodate Portland's extensive bicycle population, this S70 incorporates four permanent bicycle racks located adjacent to each forward doorway.

The S70 utilizes a passenger information system consisting of operator and automated announcements, passenger-operator intercoms and interior and exterior electronic destination signs, as

well as interior and exterior surveillance system for increased passenger safety.

The S70 LRV is electrically powered from an overhead wire system (catenary) and for Portland operates at speeds up to 55 mph, carrying close to 245 passengers in each vehicle with the ability to operate in multiple vehicle consists called married pairs. The S70 removes automobiles off the road in turn helping cities decrease their CO₂ emissions.



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Vehicle Dimensions and Weight

Length over coupler	95.4 ft	29090 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	101000 lbs (AWO)	45812 kg
High-floor section above TOR	2.2 ft	680 mm (with 1 step plus slight ramp)
Low-floor section above TOR (threshold)	1.2 ft (threshold)	371 mm
	1.3 ft (center)	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)	6.2 ft	1900 mm
(center truck)	5.9 ft	1800 mm