

# Trolley Bus System Evaluation



## Frequently asked questions and answers

- **How many trolley buses does King County Metro Transit operate?**

Metro has 159 electric trolley buses.

- **How long have the trolley buses been in operation?**

Trolleys like the ones you see on Seattle's streets today have been in operation for 70 years. Metro Transit was started in 1973, when the public Seattle Transit System was merged with the private Metropolitan Transit Corporation. Metro inherited Seattle Transit's aging trolley network, and replaced it with a new expanded electric trolley bus system in 1978.

The Metro Employees Historic Vehicle Association (MEHVA) has an online history of the trolleys in Seattle at [www.mehva.org/60years.html](http://www.mehva.org/60years.html).

- **How big is Metro's trolley system?**

There are 14 Metro routes that use electric trolley buses running on more than 70 miles of two-way overhead wire throughout downtown Seattle, Ballard, Queen Anne, the University District, Capitol Hill, First Hill, Beacon Hill and the Rainier Valley.

- **How many trolley bus routes does Metro operate?**

There are currently 14 trolley routes: 1, 2, 3, 4, 7, 10, 12, 13, 14, 36, 43, 44, 49, and 70.

- **How many miles do the trolleys travel a year?**

In 2009, Metro trolleys traveled 2,906,297 miles during 597,459 hours of service.

- **What is the ridership for the trolley routes, and what percentage do trolley riders represent of all Metro ridership?**

There were 19.7 million boardings on Metro's trolley routes in 2009. That's about one-fifth of Metro's total average weekday boardings.

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- **Are there other public trolley bus systems in the United States?**

Not many. Only Seattle, San Francisco, Boston, Philadelphia, and Dayton, Ohio have electric trolley buses currently in operation. In Canada, Vancouver, B.C. also has trolleys. Electric trolley buses are more common in Europe, Asia, and Latin America.

- **How are Metro trolley buses different than Metro diesel or hybrid buses?**

A Metro trolley bus draws power from the overhead electrified wires, and that power is used to drive a large electric motor. The trolleys connect to the wire via a pole on the roof that is topped by an insulated shoe. The pressure from the spring-loaded pole keeps the shoe pushed up against the overhead wire, providing the connection that powers the bus and allowing the trolley to maneuver through turns and around corners.

A Metro trolley cannot operate if it is not connected to the overhead power. Unlike a Metro hybrid bus, a trolley has no on-board energy storage system. So, when a trolley is braking or going downhill, the extra energy that is developed is dissipated through resistors. Some energy can be put back into the power lines, but only if there is another trolley on the line that needs the energy.

With hybrid buses, the engine is coupled to a generator and the generated energy powers the motor. When more power is generated than is needed to operate the bus, the extra energy goes into a battery pack for later use. When the bus is coasting downhill or braking, that energy is turned into electricity and also stored into the battery pack on the roof of the bus. Stored energy in the batteries assists in the acceleration of the bus during starts, reducing the load on the diesel engine.

- **Where does Metro get the electricity used to power the trolley buses?**

Metro purchases electricity from Seattle City Light. The power is delivered to 40 Metro substations scattered across the city. Each substation houses electrical equipment that converts the incoming 26,000-volt AC (alternating current) power into the 700-volt DC (direct current) power used by the trolleys. The converted electricity is fed into the overhead wires via conduits that travel underneath Seattle streets and then the poles that support the overhead system.

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