

Seattle Public Library: Green Lake Branch

Improving safety & climate resiliency in historic buildings



Photo Credits: Chloe Collyer

Public libraries are like the living room of the community, providing places to meet, learn, and explore new ideas where everyone is welcome. Libraries must also be safe and accessible for all who use them. The City of Seattle is working to ensure all Seattle Public Library facilities meet these needs, including the historic Green Lake branch.

In 2023 and 2024, the Green Lake branch underwent extensive seismic, accessibility, and energy upgrades to reduce climate-polluting greenhouse gas (GHG) emissions and improve the building's safety and functionality for patrons and staff. This included reinforcing the walls with steel and concrete, installing a new ADA-accessible elevator, removing the gas boiler, and installing new electric heating, cooling, ventilation, and air filtration systems. The building is now free of climate-polluting fossil fuels and fully powered by cleaner, [carbon-neutral electricity](#) supplied by Seattle City Light.

Originally constructed in 1909, the Green Lake branch is one of several historic municipal buildings the City is transitioning to carbon-neutral electricity, and is among the more than 50 full or partial electrification projects the City of Seattle has completed since 2018. The building's historic character was preserved during the entire renovation process, showing what is achievable for older and historic buildings in need of energy upgrades.

About

Address: 7364 East
Green Lake Dr N

Size: 9,498 SF

Original construction:
1909

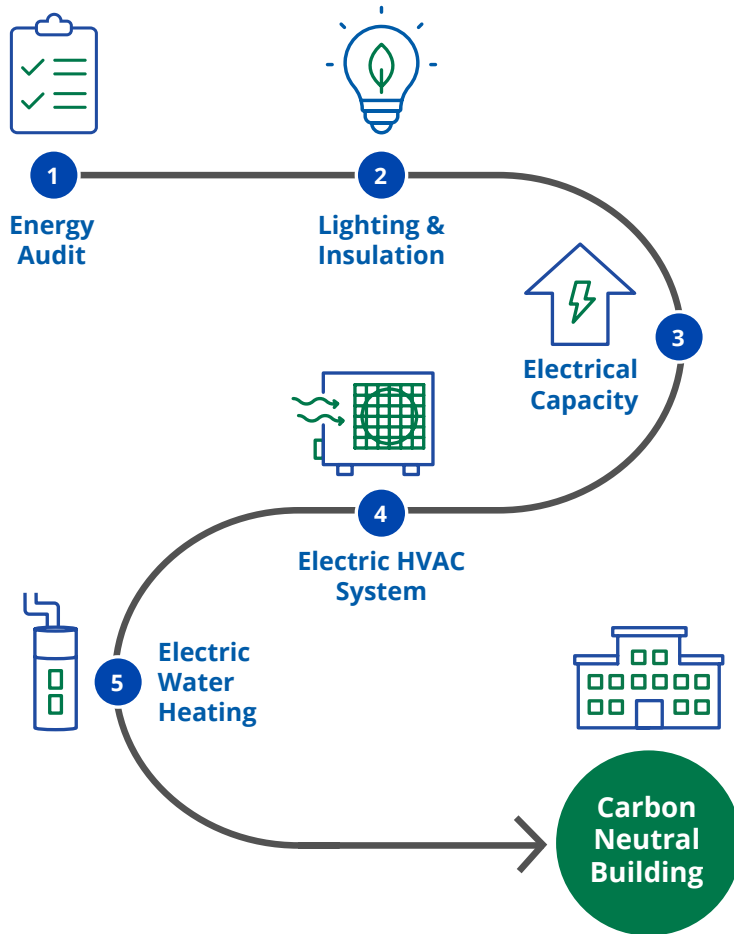
Owner: City of Seattle

**Estimated annual
GHG emissions
reduction:** 92%

**Estimated annual
energy use reduction:**
48%

**Service providers
& contractors:**
BuildingWork, Blanca
Lighting Design, Kassel
& Associates, Holmberg,
BreakMechanical

Steps to reducing carbon emissions



1 Energy audit

An energy audit revealed the library's electric power capacity was too low for the building's needs at only 300 amps. It also discovered that some of the original light fixtures needed replacement and the building lacked insulation — a typical finding in older buildings of masonry construction.

2 Lighting & insulation

One of the project team's first steps was to replace the old light fixtures with LED lighting. Special kits were used to preserve the lighting's historic look. They also added insulation in the attic, skylight well walls, and walls that were opened for seismic upgrades.

3 Electrical capacity

Seattle City Light increased the building's electrical capacity to 600 amps so the library would have enough power to run the new ADA-accessible elevator and multiple heat pumps.

4 Electric HVAC system

The old gas-fired boiler, meter, and lines were removed and two electric air source heat pumps were installed to provide both cooling and heating. A dedicated outdoor heat recovery system with energy recovery and MERV-13 air filter was also installed to improve heating and cooling efficiency and indoor air quality.

5 Electric water heating


An all-in-one AOSmith heat pump water heating system was installed to provide domestic hot water.

Green Lake Library GHG Emissions & Energy Use Before and After Upgrades

GHG emissions before upgrades

 **18**
tons/year

GHG emissions after upgrades

 **1.5**
tons/year*

Energy use before upgrades

 **66.4**
kBtu/SF/year

Energy use after upgrades

 **34.4**
kBtu/SF/year

**Emissions remaining before Seattle City
Light carbon offsets.*

Why upgrade older & historic buildings?

Over 90% of building-related greenhouse gas emissions in Seattle come from burning fossil fuels like gas and oil for hot water, space heating, and appliances.

Prior to upgrades, the Green Lake branch used a gas-fired boiler for water and space heating. Before that, the building was heated with coal. Like many older buildings, the library is of masonry (brick and stone) construction and lacks insulation, causing the boiler to work overtime.

Like most Seattle buildings of its age, the library also lacked air conditioning. Removing outdated heating systems and installing new electric heat pumps that provide both cooling and heating allows older buildings to stay usable in extreme hot and cold weather.

Green Lake was primarily a seismic and accessibility retrofit. However, the project team saw opportunities to do energy and emissions reduction work at the same time, which saves operational downtime and money versus doing several projects separately.



We took an old building and improved its energy efficiency, climate resiliency, safety, and accessibility by leveraging the most current building technologies. If we can do it in this building, we can do it in any older building and new ones too.

CJ de Leon, Capital Improvements Project Manager at The Seattle Public Library



New electrical panel



Heat pump condenser on roof



Interior heat pump unit



New steel pillars add earthquake protection and blend into the historic architecture



New efficient, electric heat pump water heater

Building for climate resiliency

Eliminating greenhouse emissions from buildings and making them climate resilient can go hand-in-hand. Before renovations, the Green Lake branch would close during heat waves for the safety and comfort of its patrons and staff. In 2022, Seattle Public Library buildings were closed more than [130 times because of high heat](#).

With new electric heat pump cooling, filtration and ventilation systems, the library will be able to stay open all year and serve as a refuge for community members during heat waves and wildfire smoke, which are becoming more frequent due to climate change. Green Lake can provide these services while drawing all of its energy from the city's carbon-neutral electricity rather than climate-polluting fossil fuels.

Why do we need Building Emissions Performance Standards?

In Seattle, buildings are one of the largest sources of climate pollution, responsible for more than a third of our City's greenhouse gas emissions. These emissions pollute our air, accelerate climate change, and harm people's health and the environment, disproportionately impacting communities of color and people with lower incomes. Seattle's new [Building Emissions Performance Standard \(BEPS\)](#) requirement is one of the most impactful climate actions Seattle is taking.

Get started today.

Addressing emissions from buildings is one of the most powerful levers for tackling climate change. Get started on your own path by talking with your facility staff and independent service providers to explore energy efficiency and options like heat pumps well before you need to replace equipment. Contact cleanbuildings@seattle.gov for more information about free City technical support.