



SHOWCASE PROJECT: CHATTANOOGA PUBLIC LIBRARY

SOLUTION OVERVIEW

The Chattanooga Public Library, located in the heart of downtown Chattanooga, was constructed in 1976, includes 108,500 square feet of conditioned space, and served over 285,000 patrons in FY2015. The first three floors house the majority of the Library's collections and a coffee shop, while the 4th Floor has been converted to a public laboratory and educational facility that focuses on programming, information, design, technology, and the applied arts. This unique 12,000-square-foot space hosts everything from traditional equipment such as screen printers, sewing machines, and a soldering bench, to modern technology such as a laser cutter, vinyl plotter, 4K monitor, and 3D printers.

The city is executing a three-pronged approach to a major energy-efficiency and revitalization effort for the Library, including lighting, HVAC equipment, and digital control upgrades.

After joining the Better Buildings Challenge, the city gained valuable partners in the Electric Power Board (EPB) of Chattanooga and the Tennessee Valley Authority (TVA). EPB agreed, as part of their standard services to area customers and in coordination with TVA, to schedule and complete free energy assessments on all 200 facilities included as part of the city's Better Buildings Challenge commitment to reduce energy use intensity (EUI) by 20 percent by 2025. Since the Library's HVAC equipment was originally installed during construction in 1976, the city coordinated with EPB to expedite an Energy Assessment for this property.

While their findings confirmed the obvious energy savings that could be gained by updating the lighting and HVAC equipment, the city also recognized the value in highlighting the Library due to its prominent location. The Library is located near EPB's downtown headquarters, TVA's operational headquarters, and the Innovation District's hub, the Enterprise Center (Edney Building); each of these partners are local leaders in technology and innovation.

Additionally, the Library is known as an institution that serves all socio-economic sectors, providing a unifying opportunity to educate the community about the value of conserving energy and the dollar savings that come with it. By choosing the Library as a Showcase Project, the City of Chattanooga and the Office of Mayor Andy Berke are re-affirming that they are committed to serving all citizens across all ages, backgrounds, and income levels, and are invested in municipal improvements that will benefit all Chattanoogaans for many generations to come.

The Library has been a part of the [Gig City's](#) 10-gigabit ecosystem and infrastructure since 2012, when the 4th Floor became the first public library space in the United States to offer access to a full gig of internet speed. In partnership with the Mozilla Foundation, the National Science Foundation, and others, the Library launched the [GigLab](#), specifically designed for gigabit-related experimentation and learning, application testing, and workforce development.

SECTOR TYPE

Local Government

LOCATION

Chattanooga, Tennessee

PROJECT SIZE

109,000 square feet

FINANCIAL OVERVIEW

Project Cost: \$1,509,000*

SOLUTIONS

Chattanooga identified necessary upgrades to include replacing dated lighting infrastructure with LED technology throughout the building, and a complete overhaul of the heating, ventilation, and air conditioning (HVAC) system. Measures include new digital controls, a high efficiency chiller and boiler, variable speed drives on the air handler fans and pumps, and retro-commissioning of HVAC zone controls.

The implemented energy measures are saving the Library over \$60K. The table below details these cost savings.

| Energy Savings Measure | Energy Measure Cost | Energy Cost Savings Achieved | Notes |
|---|---------------------|------------------------------|--|
| Lighting Upgrades with controls | \$470,000 | \$37,715 (Est.) / YR | T12 (fluorescent incandescent to technology, con |
| HVAC Upgrades with controls and retro-commissioning | \$933,700 | \$24,004 (Est.) / YR | New chiller/ boiler controls |

Further, patrons now have multiple sustainable transportation modes to access the Library. These include:

- One of the country's first (free) [all-electric downtown shuttle systems](#) operated by Chattanooga Area Regional Transportation Authority (CARTA);
- Two charging stations for Chattanooga's brand new [electric vehicle car share program](#), which were recently installed at the intersection directly in front of the Library

- The Chattanooga bike share program, '[Bike Chattanooga](#)', which has a station location in front of the Library entrance. There are also bike racks for those who bring their own bicycles.
- Ample sidewalk space and protected crossings for downtown pedestrians.

OTHER BENEFITS

By converting existing fluorescent lighting to more efficient LED lighting at the Library, the City of Chattanooga will avoid over \$20,000 in labor and material costs required to maintain the existing lighting infrastructure, which includes over 140 man-hours of Library facility maintenance staff. In addition to energy savings, the lighting upgrade drastically improved lighting quality and reading experiences for patrons. The HVAC replacement and commissioning will provide improved building environmental control, including tighter humidity levels, leading to prolonged life of books and sensitive documents. Library staff members will continue their sustainability efforts as they explore options to implement a robust recycling program, rainwater catchment system, and sustainable landscaping plan.

Chattanooga also recently made some updates to the Library interior to give it a more modern feel. In undertaking that effort, the city decided to repurpose existing materials rather than sourcing new materials. Features included: contoured, ceiling-mounted acoustic dampeners; textured, stainless steel-lined elevator panels; multi-colored book cases and modules; and restored vintage furniture. The Library staff and Board have ambitious plans to continue the revitalization of this iconic institution for the 21st century.

*Project Incentives (TVA Energy Right): \$65,000

Annual Energy Use

Baseline(2016)
62.34 kBtu/sq.ft.

Expected(2019)
36.78 kBtu/sq.ft.

Energy Savings
41%

Annual Energy Cost

Baseline(2016)
\$180,500

Expected(2019)
\$118,700

Cost Savings
\$61,800



Exterior view, Chattanooga Public Library; iconic Lookout Mountain in background



'Volumes' (Jim Collins), Chattanooga Public Library