

Metropolitan Government
of Nashville and Davidson County

Megan Barry, Mayor
Nancy Whittemore, Director



Department of General Services

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August 15, 2016

Metropolitan Government Clerk's Office
Metropolitan Courthouse
1 Public Square, Suite 205
Nashville, TN 37201

Dear Honorable Members of the Metropolitan Government of Nashville & Davidson County Council:

In accordance with Chapter 16.60, Section 16.60.110 of the Metropolitan Code, the Department of General Services is providing summary reports for buildings constructed by General Services as LEED ("high performance") buildings. The annual reporting requirements for LEED buildings include:

1. A building's energy and water usage for the previous year compared to a non-LEED buildings of similar size and use within the metropolitan area;
2. A building's energy and water cost savings for the previous year compared to a non-LEED buildings of similar size and use within the metropolitan area.

The high performance buildings that are presented in this annual report are those in which a minimum of one year of energy data is available and include:

<u>High-Performance Building</u>	<u>Occupancy Date</u>
Bellevue Library	January 2015
Douglass Head Start School	January 2014
Fire Station #03	October 2012
Fire Station #11	December 2013
Fire Station #21	December 2013
Fire Station #30	June 2013
Fire Station #31	October 2012
Fire Station #33	May 2013
Fire Station #35	October 2011
Highland Heights School	July 2014
Howard Office Building	October 2010
Lentz Public Health Center	July 2014
Lindsley Hall	June 2010
Madison Police/Crime Lab	November 2013
Midtown Police Precinct	August 2014
Southeast Davidson Library & Community Center	October 2014
West Police Precinct	February 2012

- This report is based on developing an *Energy Utilization (Use) Index*, "EUI", for each high performance building using 2015 energy consumption, which can then be compared to Metro non-high performance buildings and national benchmark measurements.
- The measurement of EUI is the amount of energy consumed (measured in Thousands of British Thermal Units (MBTU's), and divided by the gross conditioned building area in square feet*. The EUI is the most common means of expressing the total energy consumption for a building and provides information similar to "average gas mileage" of your car.
- Benchmark building performance data was provided by the Department of Energy's Commercial Building's Energy Consumption Survey (CBECS). Metro's High Performance buildings' annual energy consumption (EUI) was compared to data from similar buildings from a similar climate zone. For Nashville, benchmark data was used from Climate Zone 4A.

In summary, of the seventeen high performance buildings reviewed in this report**, Metro General Services diverted costs of a total of more than \$326,130 in energy conservation from electricity and gas consumption in comparison to the national average. Over \$763,000 in energy conservation was achieved on the eleven facilities where a similar non-LEED comparable building was available.

Of the facilities where water consumption and comps were available, the high performance buildings averaged a total savings of more than 550,000,000 gallons of water compared to their non-LEED comparable.

Please feel free contact me with any questions.

Sincerely,



NANCY WHITTEMORE

Director, Department of General Services

* The Department of General Services is in the process of measuring square footage of all their buildings under their management. This updated data will be used in future reports.

** The data in this report was collected and verified by Facility Diagnostics, General Services' commissioning expert.

Metro Department of General Services New Construction

Jan 2015- Dec 2015

Bellevue Library

720 Baugh Road, Nashville, 37221

Opening date 1/29/15

LEED Gold

Total Cost Construction \$ 9,554,115

Fire Station # 20

1626 Harding Place, Nashville, 37215

Opening date 10/19/15

LEED Gold

Total Cost Construction \$ 4,849,059

Fire Station # 19

520 26th Avenue North, Nashville, 37209

Opening date 12/17/15

LEED Platinum

Total Cost Construction \$ 8,601,736

* Metro General Services did not renovate a building for calendar year 2015.

Metro Department of General Services’ Summary Report

FIRE STATIONS

Energy Savings:

Energy consumption for the seven High Performance Fire Stations is compared in the Table below to a benchmark national average of energy consumption for a similar type building in a similar climate zone; and to a similar non-high performance-constructed Metro building of similar function (Fire Station #01).

ID	Building Square Footage	2015 EUI	Benchmark EUI*	F.S. #01 (Non-High Performance) EUI**
FS 03	16,061	78,755	92,200	74,417
FS 11	14,980	53,617	92,200	74,417
FS 21	19,069	62,219	92,200	74,417
FS 30	12,886	72,733	92,200	74,417
FS 31	16,010	52,465	92,200	74,417
FS 33	15,485	65,318	92,200	74,417
FS 35	12,496	50,268	92,200	74,417

* - Benchmark EUI based on DoE’s Commercial Buildings Energy Consumption Survey (CBECS), building type “Public Order and Safety” ** - Non-high performance Metro building used for comparison – Fire Station #01 (11,250sq.ft.)

Energy costs in 2015 for the seven high performance Fire Stations is compared in the Table below to a benchmark national average of energy cost based on consumption for a similar type building in a similar climate zone; and to a similar non-LEED Metro building of similar function (Fire Station #1).

ID	Building Square Footage	2015 Energy Cost/SF	Annual Savings Compared Non-LEED building (FS #1)**	Annual Savings Compared to Benchmark (Nat’l Avg.)
FS 03	16,061	1.83	-<\$1,625>	\$5,000
FS 11	14,980	1.67	\$9,685	\$18,000
FS 21	19,069	1.62	\$6,065	\$14,900
FS 30	12,886	1.76	\$525	\$6,000
FS 31	16,010	1.48	\$9,925	\$18,000
FS 33	15,485	1.78	\$3,850	\$11,300
FS 35	12,496	1.37	\$8,220	\$14,275

Total annual savings for the 7 High Performance Fire Stations compared to National Average: \$ 73,200

Total annual savings for the 7 High Performance Fire Stations compared to non-LEED FS #01: \$ 36,645



Water Savings

ID	Building Square Footage	2015 Domestic Water Consumption (gal.)	2015 FS#01 Domestic Water Consumption (gal.)	2015 Domestic Water Savings
FS 03	16,061	299,200	229,636	-69,564
FS 11	14,980	121,924	229,636	107,712
FS 21	19,069	192,236	229,636	37,400
FS 30	12,886	316,404	229,636	-86,768
FS 31	16,010	92,004	229,636	137,632
FS 33	15,485	91,256	229,636	138,380
FS 35	12,496	106,964	229,636	122,672

Total: 387,464 gallons saved

Total average annual domestic water savings for the seven High Performance Fire Stations compared to non-LEED building FS #01: over 55,000 gallons per facility

Solar Savings

The six fire stations with installed solar panels have collectively returned approximately 69,958 Kilowatts back to NES resulting in a rebate of approximately \$6,861.24.

POLICE PRECINCTS

Energy Savings

Energy consumption for the High performance West Police Precinct (WPP) and Midtown Police Precinct are compared in the Table below to a benchmark national average of energy consumption for a similar type building in a similar climate zone; and to a similar non-LEED Metro building of similar function (North Police Precinct -NPP).

ID	Building Square Footage	2015 EUI	Benchmark EUI*	North PP (Non-LEED) EUI**
WPP	45,176	61,738	92,200	248,801
Midtown	21,722	91,757	92,200	248,801

* - Baseline EUI based on DoE’s Commercial Buildings Energy Consumption Survey (CBECS), building type ‘Public Order and Safety’

** - Non-high performance Metro building used for comparison – North Precinct (21,796 sq.ft.)

ID	Building Square Footage	2015 Energy Cost/SF	Annual Savings Compared Non-LEED buildings (North Precinct)	Annual Savings Compared to Benchmark (Nat’l Avg.)
WPP	45,176	1.84	\$251,475	\$40,000
Midtown	21,722	2.92	\$108,409	\$305

Total annual savings for the high performance Police Precincts compared to National Average: \$ 40,305
 Total annual savings for the high performance Police Precincts compared to non-LEED NPP: \$ 359,884

Water Savings

ID	Building Square Footage	2015 Water Consumption (gal.)	2015 NPP Water Consumption (gal.)	2015 Water Savings
WPP	45,176	106,964	185,504	78,540
Midtown	21,722	1,188,572	185,504	(1,003,068)

924,528 gallons saved compared to Benchmark (NPP)

Total average annual water savings for the two High Performance Police Stations compared to non-LEED building NPP: over 462,264 gallons saved per facility

MADISON POLICE PRECINCT AND CRIME LAB

Energy Savings

Energy consumption for the Madison Police Precinct (MPP) and Crime Lab on Myatt Drive is compared in the Table below to a benchmark national average of energy consumption for a similar type building in a similar climate zone. There is not a comparable Metro GSA facility that can be used to provide local non-LEED benchmarking.

ID	Building Square Footage	2015 EUI	Benchmark EUI*	Non-LEED EUI
Myatt	80,000	204,703	248,000	NA

* Benchmark EUI based on DoE’s Commercial Buildings Energy Consumption Survey (CBECS), building type combination of “Office”; laboratory; and “Office/Public Order and Safety”

Total annual savings for the High Performance MPP & Crime Lab compared to National Average:
\$71,000.00

For a similar type building as the Madison Police Precinct and Crime Lab building (Building Type = a blend of “Office” and “Public Order and Safety” and “Laboratory”), the annual energy use intensity for the 4A Climate Zone (Nashville) should average 248 kBTU/ft2 per year. The average annual energy consumption for the facility in 2015 was approximately 204.7 kBTU/ft2 per year.

This results in an annual utility bill savings of over \$71,000 per year compared to the energy costs for a comparable building.

Water Savings

Madison Police Precinct and Crime Lab had a total consumption of 25,806,000 gallons of water for the 2015 analysis period.

Facility Diagnostics did not have a local site of similar size and function to utilize for this analysis comparison.

OFFICE BUILDINGS

Energy Savings

Energy consumption for the two high performance Metro office buildings- Lindsley Hall (LH) and Howard Office Building (HOB) - is compared in the Table below to a benchmark national average of energy consumption for a similar type building in a similar climate zone; and to a similar non-LEED Metro building of similar function (Fire Headquarters Office Building).

ID	Building Square Footage	2015 EUI	Benchmark EUI*	Fire HQ (Non-LEED) EUI**
LH	43,944	54,101	83,300	141,228
HOB	141,500	88,934	83,300	141,228

* Benchmark EUI based on DoE’s Commercial Buildings Energy Consumption Survey (CBECS), building type “Office” for LH; building type combined “Office/Public Order and Safety” for HOB ** Non-high performance Metro building used for comparison – Fire Headquarters Office Building (25,114 sq.ft.)

For the above analysis, the central energy plant (CEP) serving Lindsley Hall, Howard Office Building and Metro Office Building are included in the Howard Office Building utility data. The annual energy consumption for HOB is therefore higher to account for the energy consumption of the CEP (chillers, pumps, cooling tower and boilers) that serves the Fulton Campus facilities.

Energy meters have been recently installed in the HOB at the central energy plant to accurately measure, monitor and account for the energy from the CEP to Lindsley Hall and the Metro Office Building.

Energy costs in 2015 for the three high performance office buildings are compared in the Table below to a benchmark national average of energy cost based on consumption for a similar type building in a similar climate zone; and to a similar non-high performance Metro building of similar function (Fire Headquarters).

ID	Building Square Footage	2015 Energy Cost/SF	Annual Savings Compared Non-high performance buildings (Fire HQ)	Annual Savings Compared to Benchmark (Nat’l Avg.)
LH	43,944	1.49	\$95,000	\$31,625
HOB	141,500	2.17	\$184,250	-<\$19,850>

** Fire HQ =\$4.39 w/25,114sqft. **

Total annual savings for the two High Performance office buildings compared to National Average:

\$ 11,775

Total annual savings for the three High Performance office buildings compared to non-LEED Fire HQ:

\$ 279,250

Water Savings

ID	Building Square Footage	2015 Water Consumption (gal.)	2015 FS HQ Water Consumption (gal.)	2015 Water Savings
LH	43,944	1,815,614	168,300	(1,647,314)
HOB	141,500	4,136,374	168,300	(3,968,074)

5,615,388 gallons saved compared to Benchmark Fire Station Headquarters Building

Total average annual water savings for the two High Performance Office Buildings compared to non-LEED building Fire Station Headquarters Building: over 2,807,694 gallons per facility

Lindsley Hall and Howard Office Building are not separately metered within the Fulton Campus, and is therefore not able to be analyzed for truly accurate comparative consumption.

Solar Savings

Solar panels installed at Howard Office Building produced a return of approximately 30,489 Kilowatts back to NES, resulting in a rebate of \$3,841.

LENTZ

Energy Savings

Energy consumption for the Lentz Public Health Center on Charlotte Avenue is compared in the Table below to a benchmark national average of energy consumption for a similar type building in a similar climate zone. There is not a comparable Metro GSA facility that can be used to provide local non-LEED benchmarking.

ID	Building Square Footage	2015 EUI	Benchmark EUI*	Non-LEED EUI
Lentz	113,500	162,709	172,700	NA

* Benchmark EUI based on DoE's Commercial Buildings Energy Consumption Survey (CBECS), building type combination of "Office"; "Laboratory"; and "Office/Public Order and Safety"

For a similar type building as the Lentz Public Health Center (Building Type = "Health care"), the annual energy use intensity for the 4A Climate Zone (Nashville) should average 172.7 kBTU/ft² per year. The average annual energy consumption for the Lentz Public Health Center in 2015 was approximately 162.7 kBTU/ft² per year.

Total annual savings for the High Performance Lentz Public Health Center compared to National Average: \$ 21,000

Water Savings

Lentz Public Health Center had a total consumption of 1,235,696 gallons of water for the 2015 analysis period.

Facility Diagnostics did not have a local site of similar size and function to utilize for this analysis comparison.

SCHOOLS

Energy Savings

Energy consumption for the Douglass Head Start School (DHSS) and Highland Heights School (HHS) is compared in the Table below to a benchmark national average of energy consumption for a similar type building in a similar climate zone; and to a similar non-LEED Metro building of similar function (Bellevue Middle School-BMS).

ID	Building Square Footage	2015 EUI	Benchmark EUI*	Non-LEED EUI
Douglass	26,642	40,328	68,800	65,672
Highland Heights	109,487	53,318	68,800	65,672

* Benchmark EUI based on DoE’s Commercial Buildings Energy Consumption Survey (CBECS), building type combination of “Education”.

** - Non-high performance Metro building used for comparison – Bellevue Middle School (99,107 sq.ft.)

ID	Building Square Footage	2015 Energy Cost/SF	Annual Savings Compared Non-LEED buildings (Bellevue Middle)	Annual Savings Compared to Benchmark (Nat’l Avg.)
Douglass	26,642	1.43	\$6,394.08	\$26,750
Highland Heights	109,487	1.58	\$9,853.83	\$31,000

Total annual savings for the two high performance schools compared to National Average: \$ 57,750

Total annual savings for the high performance schools compared to non-LEED BMS: \$ 16,248

Water Savings

ID	Building Square Footage	2015 Water Consumption (gal.)	2015 Bellevue Middle Consumption (gal.)	2015 Water Savings
Douglass	26,642	549,032	11,693,484	11,144,452
Highland Heights	109,487	326,128	11,693,484	11,367,356

22,511,808 gallons saved compared to Bellevue Middle School

Total average annual water savings for the two High Performance School Buildings compared to non-LEED building Bellevue Middle School: over 11,255,904 gallons per facility

LIBRARIES

Energy Savings

Energy consumption for the Bellevue Branch Library and Southeast Davidson Library and Community Center is compared in the Table below to a benchmark national average of energy consumption for a similar type building in a similar climate zone; and to a similar non-LEED Metro building of similar function (Green Hills Library).

ID	Building Square Footage	2015 EUI	Benchmark EUI*	Non-LEED EUI
Bellevue	24,720	66,691	77,500	142,735
SE Davidson	88,755	59,648	77,500	142,735

* Benchmark EUI based on DoE’s Commercial Buildings Energy Consumption Survey (CBECS), building type combination of “Education” and “Public Assembly”.

** - Non-high performance Metro building used for comparison – Green Hills Library (25,540 sq.ft.)

ID	Building Square Footage	2015 Energy Cost/SF	Annual Savings Compared Non-LEED buildings (Green Hills Library)	Annual Savings Compared to Benchmark (Nat’l Avg.)
Bellevue	24,720	2.16	\$4,696.80	\$8,600
SE Davidson	88,755	1.60	\$66,566.25	\$42,500

Total annual savings for the high performance libraries compared to National Average: \$ 51,100
 Total annual savings for the high performance libraries compared to non-LEED building Green Hills Library: \$71,264

For a similar type building as the SE Davidson Library and Community Center building (Building Type = a blend of “Education” and “Public assembly”), the annual energy use intensity for the 4A Climate Zone (Nashville) should average 77.5 kBTU/ft² per year. The average annual energy consumption for the SE Davidson Library and Community Center in 2015 was approximately 59.6 kBTU/ft² per year. This results in an annual utility bill savings of over \$42,500 per year compared to the energy costs for a similar type building.

Water Savings

Bellevue Branch Library had a total consumption of 754,732 gallons of water for the 2015 analysis period. Compared to the non-LEED comp, Bellevue Branch Library saved more than 540,000,000 gallons of water.

Southeast Davidson Library and Community Center is not separately metered from the Ford Ice Center, and is therefore not able to accurately be analyzed for consumption.