



# Edina Building Energy Use Benchmark

January 10, 2013

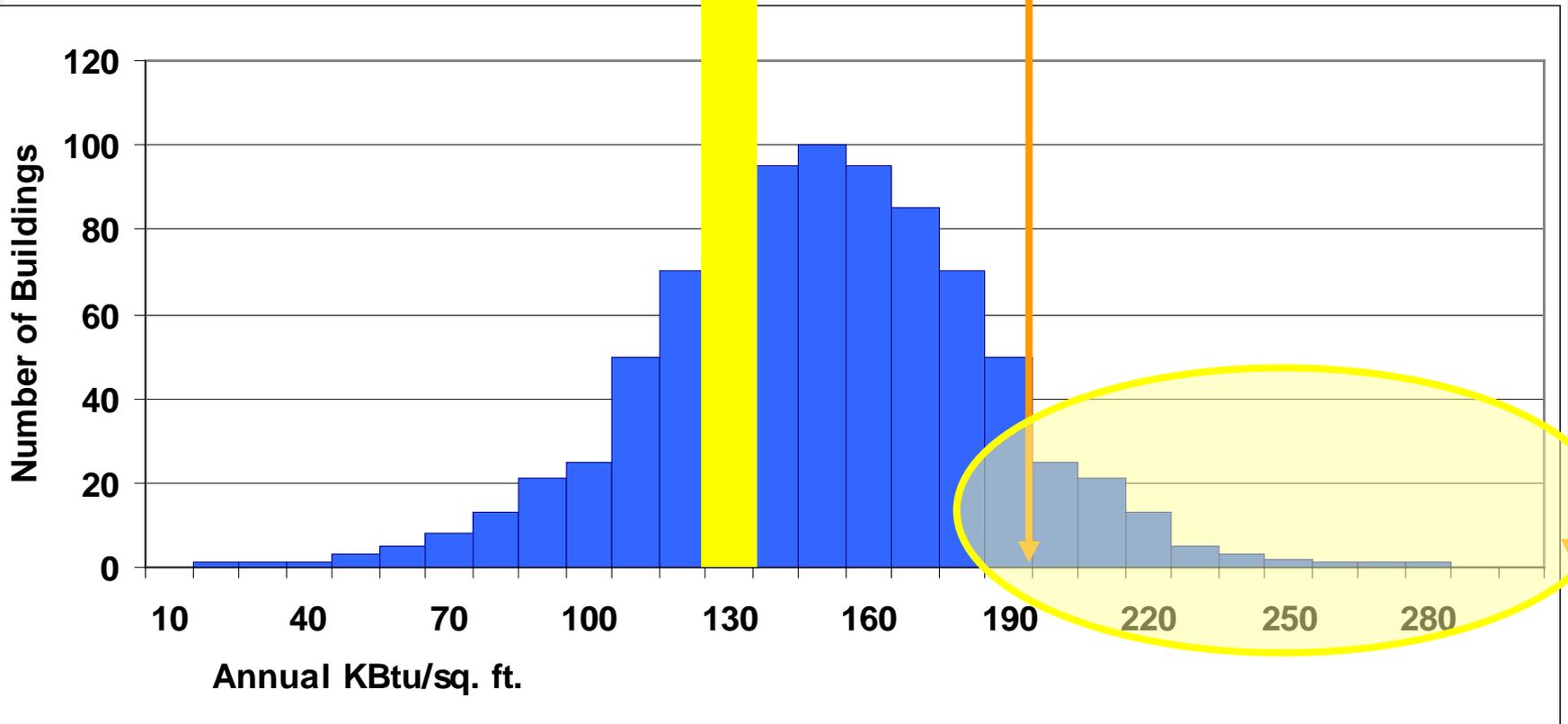
# Building Benchmark Concept:



**MN Energy Code Target Range**

**50% over Code**

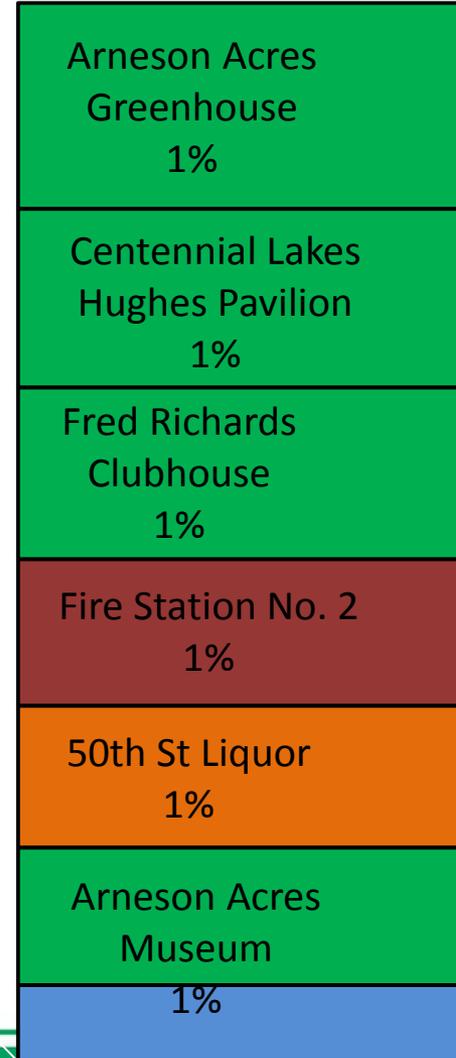
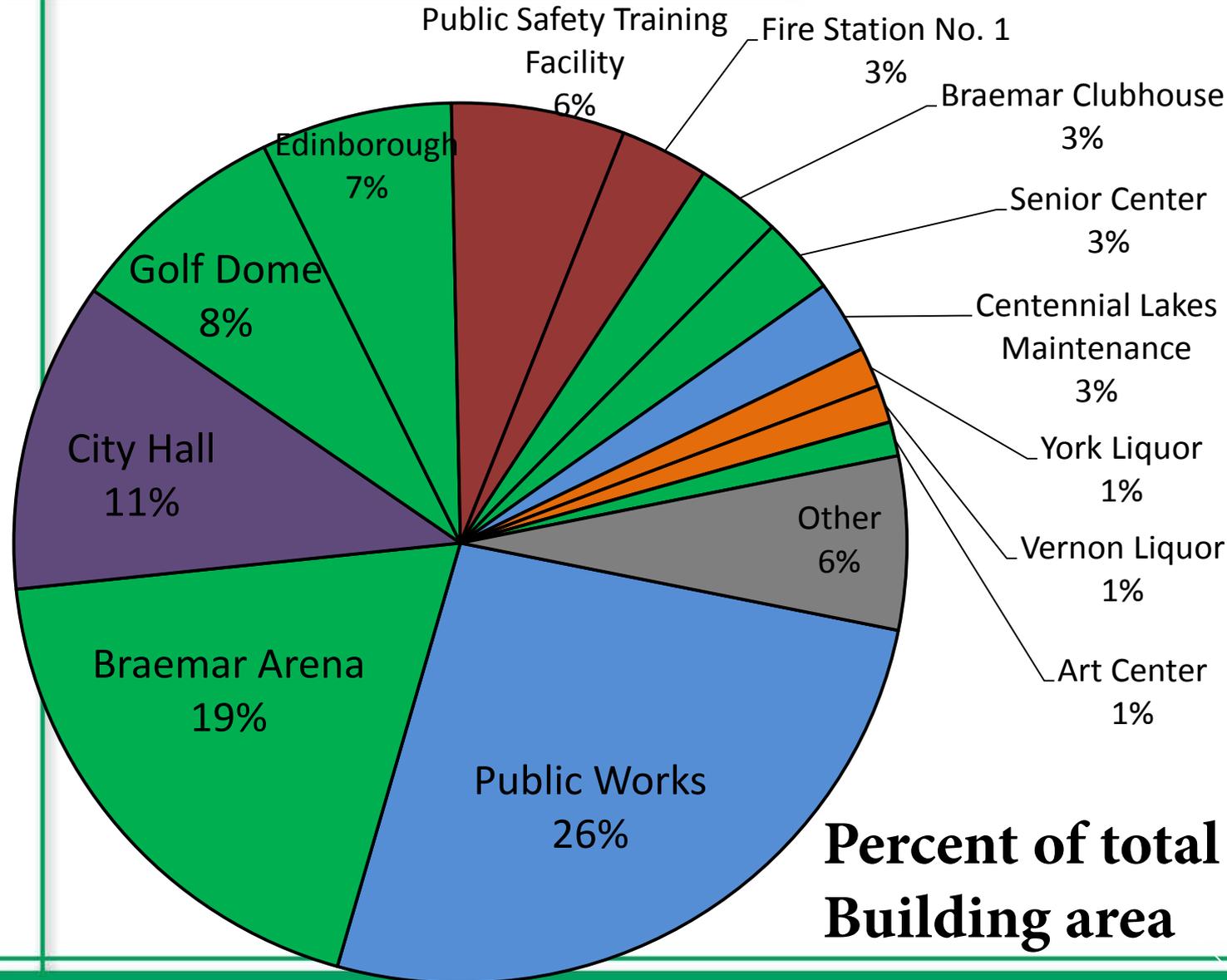
**Target Buildings with Energy Performance 50% Over Energy Code**





- How is Edina using B3?
- How many buildings does the City own?
- What is the current building energy use?
- What opportunities exist for energy savings?
- How have previous energy efficiency improvements performed?
- Are we meeting our environmental goals?

# Building Stock Overview:



**Percent of total Building area**

## Benchmark Comparison:



BENCHMARK (BM)	SF	BM Ratio	\$/SF	CO2 / SF	kBtu/S F
Public Works	159,205	0.38	0.79	13	32.7
Braemar Arena	114,437	1.02	2.86	55	177.0
City Hall	69,000	1.52	2.03	43	148.8
Golf Dome	48,800	1.74	1.76	33	206.4
Edinborough	42,000	2.02	3.90	74	223.2
Public Safety Training Facility	38,000	0.60	1.11	16	58.4
Fire Station No. 1	19,399	1.38	2.11	41	163.1
Braemar Clubhouse	18,935	0.97	2.90	50	128.6
Senior Center	17,000	1.96	2.06	36	142.2

### B3 Building Stock:

*20 sites, 550,000 square feet of floor space, \$1 million in energy cost and 1.9 million lbs of CO2.*

- Area normalized cost and environmental impact correlate well with benchmark score.
- 9 largest buildings represents 87% of building space.
- Top 9 compared; red highest, yellow midrange, green lowest.



## Energy Efficiency & Cost Savings

### Track Performance of Improvements

- \$500,000 Energy efficiency retrofit (McKinstry)
- \$200,000 (\$0 after grant) 24kW Solar

### Environmental Goals

- CO2 reduction from 2007 Baseline:
  - 15% by 2015
  - 30% by 2025
  - 80% by 2050



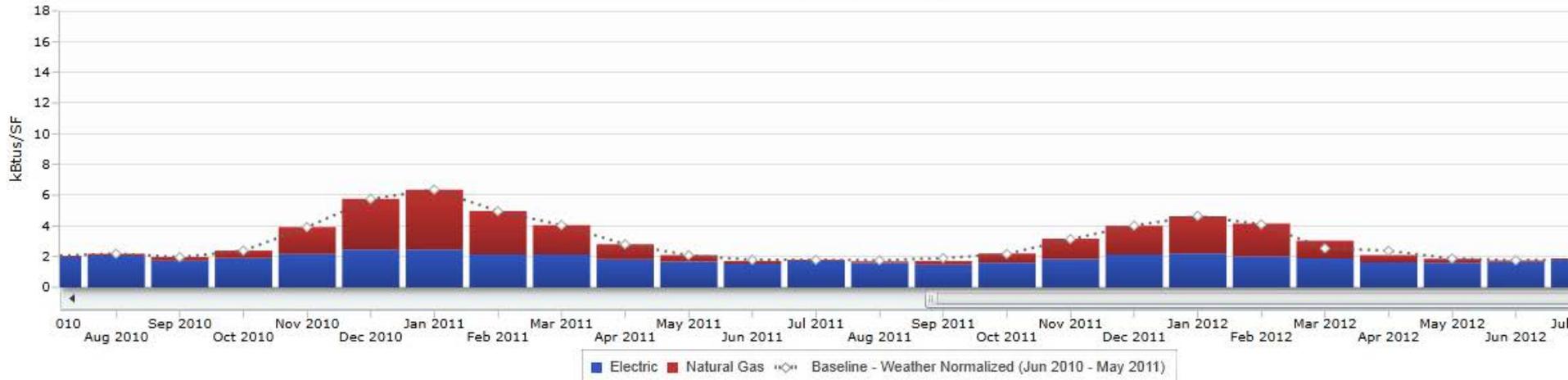
## Public Works Energy Profile:



*0.38BM - All data normalized for weather and per square foot.*

- 2010 building with comparatively low energy use, geothermal system skews energy toward electric.
- Focus on energy efficiency in initial building commissioning. Large energy reduction from previous facility.

**Monthly Continuous**  
All Fuel, Per Square Foot



**Consumption Summary By Year**

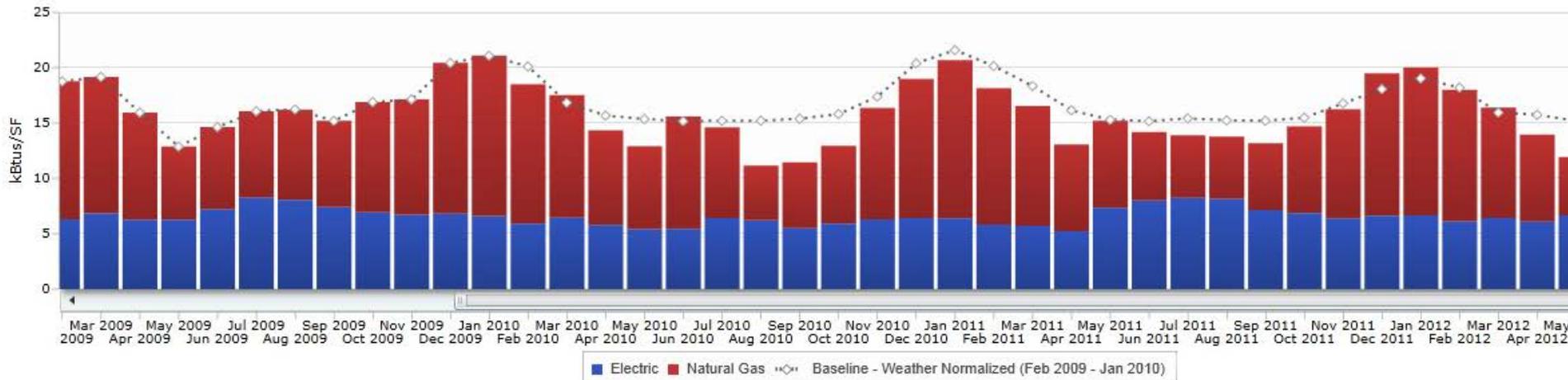
Year	Days	SF	Total kBtu /SF	Normalized Baseline kBtu /SF	Change from Baseline kBtu /SF	% Change	Total Energy Cost \$ /SF
2008	0		Missing	Missing	-	-	-
2009	365	159,205	27.27	15.91	11.36	71%	\$0.23
2010	365	159,205	59.50	29.75	29.75	100%	\$0.78
2011	365	159,205	36.55	36.86	-0.30	-1%	\$0.79
2012	321	159,205	26.83	28.59	-1.76	-6%	\$0.60



*1.02BM - All data normalized for weather and per square foot.*

- 1960's era building with many remodels and additions; average energy use compared to peer buildings, Many recent energy improvements.
- Moderate reduction from baseline

**Monthly Continuous**  
All Fuel, Per Square Foot



**Consumption Summary By Year**

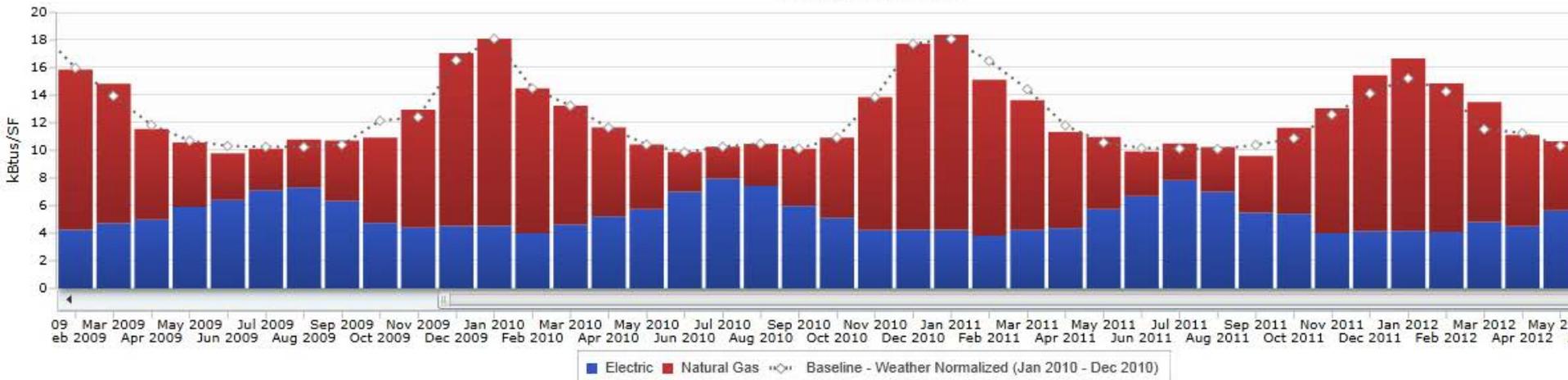
Year	Days	SF	Total kBtu /SF	Normalized Baseline kBtu /SF	Change from Baseline kBtu /SF	% Change	Total Energy Cost \$ /SF
2008	0	114,437	1.51	6.75	-5.24	-78%	\$0.03
2009	365	114,437	190.00	205.66	-15.66	-8%	\$2.63
2010	365	114,437	185.50	203.69	-18.19	-9%	\$2.55
2011	365	114,437	189.18	202.97	-13.79	-7%	\$2.86
2012	324	114,437	145.33	167.63	-22.30	-13%	\$2.28



*1.52BM - All data normalized for weather and per square foot.*

- 2005 Building with comparatively high energy use, 24 hour emergency dispatch and computer servers need reliable service; 400kW generator and 24kW solar on site.

**Monthly Continuous**  
All Fuel, Per Square Foot



**Consumption Summary By Year**

Year	Days	SF	Total kBtu /SF	Normalized Baseline kBtu /SF	Change from Baseline kBtu /SF	% Change	Total Energy Cost \$ /SF
2008	0	69,000	1.33	4.31	-2.98	-69%	\$0.02
2009	365	69,000	147.47	153.63	-6.16	-4%	\$1.93
2010	365	69,000	151.17	151.17	0.00	0%	\$2.05
2011	365	69,000	149.77	149.74	0.03	0%	\$2.04
2012	325	69,000	127.01	127.70	-0.69	-1%	\$1.64

# Opportunity for Energy Reduction:



2011 DATA	SF	BM Ratio	\$	Ton CO2	kBtu
Public Works	159,205	0.38	125,000	950	5,210,000
Braemar Arena	114,437	1.02	327,000	2,870	20,260,000
City Hall	69,000	1.52	140,000	1,340	10,270,000
Golf Dome	48,800	1.74	86,000	735	10,070,000
Edinborough	42,000	2.02	164,000	1,410	9,370,000
Public Safety Training Facility	38,000	0.60	42,000	280	2,220,000
Fire Station No. 1	19,399	1.38	41,000	360	3,160,000
Braemar Clubhouse	18,935	0.97	55,000	430	2,440,000
Senior Center	17,000	1.96	35,000	274	2,420,000

- During initial building commissioning process.
- Retrofit new technology during season of low building use.
- Increased skill of HVAC/Electrical staff to manage for energy savings.
- Provide building managers feedback on energy use and training on simple conservation practices.