

Facility Energy Assessment Report

Prepared for

THE CITY OF CONCORD

Prepared by

ABAG Energy Watch Partnership

October 12, 2007

ASSOCIATION OF BAY AREA GOVERNMENTS
**energy
watch**

City of Concord

EXECUTIVE SUMMARY

The Association of Bay Area Governments Energy Watch Partnership (ABAG Energy Watch) is providing this Energy Assessment Report to help the City of Concord (City) obtain a comprehensive view of the energy use in your facilities. This information will help you identify which facilities have the highest energy use, as well as those that have a high potential for energy savings and energy efficiency improvements. The assessment uses utility energy and cost data, as well as facility square footage information, to generate this overview. As a follow up to this assessment, ABAG Energy Watch can help the City identify inefficiencies in individual facilities and assist in addressing these problems.

This study focuses on 23 of the City's facilities within the Pacific Gas and Electric Company service territory. The 23 facilities analyzed range in size from 900 to 68,300 square feet. The total square footage covered by this analysis is 173,140, representing \$1,094,898 in annual energy bills. The City also spends about \$850,000 annually on city-wide energy uses such as streetlights, pumps, and irrigation controls.

Energy Cost

- The building with the highest annual energy cost of \$294,473/yr is the Main Police Station.
- The building with the second highest annual energy cost of \$202,624/yr is the Concord Community Park & Pool.

Energy Cost per Square Foot

- The building with the highest annual energy cost per square foot of \$8.09/ft²-yr is the Newhall Park Maintenance Office.
- The building with the second highest annual energy cost per square foot of \$7.02/ft²-yr is the Printing Services Facility.

Electricity Use

- The building with the highest annual electricity consumption of 2,027,555 kWh/yr is the Main Police Station.
- The building with the second highest annual electricity consumption of 784,549 kWh/yr is the Civic Center.

Electricity Use per Square Foot

- The building with the highest annual electricity consumption per square foot of 50.3 kWh/ft²-yr

is the Newhall Park Maintenance Office.

- The building with the second highest annual electricity consumption per square foot of 36.8 kWh/ft²-yr is the Concord Senior Citizens Center.

Peak Demand

- The building with the highest demand of 462 kW is the Main Police Station.
- The building with the second highest demand of 250 kW is the Civic Center.

Power Density

- The building with the highest power density of 18.9 W/ft² is the Printing Services Facility.
- The building with the second highest power density of 17.0 W/ft² is the Newhall Park Maintenance Office.

Natural Gas Use

- The building with the highest annual natural gas consumption of 149,759 therms/yr is the Concord Community Park & Pool.
- The building with the second highest annual natural gas consumption of 37,890 therms/yr is the Main Police Station.

Natural Gas Use per Square Foot

- The building with the highest annual natural gas consumption per square foot of 1.43 therms/ft²-yr is the Concord Senior Citizens Center.
- The building with the second highest annual natural gas consumption per square foot of 0.66 therms/ft²-yr is the Clayton Police Station.

This report is divided into the following sections.

1. A summary table of annual energy use data for all 23 facilities, as well as citywide energy uses such as streetlights and pump stations.
2. Energy cost analysis for each of the 23 facilities included in the report.
3. Energy use analysis (electricity use, demand, and gas use) for each of the 23 facilities included

- in the report.
4. An appendix listing the specific utility accounts that were used to generate the analysis for each facility in this report.

California consumers are not obligated to purchase any full-fee service or other service not funded by this program. This program is funded by California utility ratepayers under the auspices of the California Public Utilities Commission (CPUC).

This Report was prepared as a result of work sponsored by the California Public Utilities Commission (Commission). It does not necessarily represent the views of the Commission, its employees, or the State of California. The Commission, the State of California, its employees, implementers, and sub-implementers make no warranty, express or implied, and assume no legal liability for the information in this report; nor does any party represent that the use of this information will not infringe upon privately owned rights. This report has not been approved or disapproved by the Commission nor has the Commission passed upon the accuracy or adequacy of the information in this report.

Energy Assessment Report Summary - City Of Concord (Sorted by Annual Energy Cost) July 2006 - June 2007

Facility Name	Address	Area (ft ²)	Peak Demand (kW)	Annual Electricity Use (kWh)	Annual Electricity Cost	Annual Gas Use (therms)	Annual Gas Cost	Annual Energy Cost	Energy Cost (\$/ft ² -yr)
Main Police Station	1350 Galindo St	68,300	462	2,027,555	\$252,459	37,890	\$42,014	\$294,473	\$4.31
Civic Center	1950 Parkside Dr	30,831	250	784,549	\$108,033	8,660	\$9,786	\$117,819	\$3.82
Concord Senior Citizens Center	2727 Parkside Cir	7,824	117	287,668	\$40,918	11,161	\$13,188	\$54,106	\$6.92
Centre Concord	5298 Clayton Rd	29,795	130	295,057	\$44,857	5,058	\$5,736	\$50,593	\$1.70
Willow Pass Rec Center	Salvio St N/O 6th St	12,320	67	111,666	\$19,084	4,593	\$5,393	\$24,477	\$1.99
Printing Services	2730 Parkside Cir	2,436	46	89,441	\$15,759	1,035	\$1,343	\$17,102	\$7.02
Newhall Park Maint Office	South End/Newell Pkwy	1,410	24	70,949	\$11,097	181	\$304	\$11,400	\$8.09
Human Resources Dept	2974 Salvio St	4,230	20	46,207	\$7,888	97	\$202	\$8,089	\$1.91
Police Warehouse	1320 Galindo St	4,000		38,486	\$6,346	61	\$159	\$6,506	\$1.63
Clayton Police Station	4467 Clayton Rd	1,440		27,515	\$4,605	953	\$1,248	\$5,853	\$4.06
RDA Offices	1601 Sutter St # 1	4,372		26,182	\$4,409	712	\$1,022	\$5,431	\$1.24
Keller House	1760 Clayton Rd	1,800		25,255	\$4,201	417	\$536	\$4,737	\$2.63
First Five	1736 Clayton Rd	2,500		23,619	\$3,815	0	\$0	\$3,815	\$1.53
Monument Police Station	1500 Monument Blvd	900		16,089	\$2,777	265	\$408	\$3,185	\$3.54
Solano Police Station	2166 Solano Way	982		18,823	\$3,123	0	\$0	\$3,123	\$3.18
Facilities not analyzed by square footage:¹									
Concord Community Park & Pool	3500 Cowell Rd	NA	82	462,310	\$56,389	149,759	\$146,235	\$202,624	NA
Sewage Pump Station	2050 Century Blvd	NA	157	631,818	\$78,962	0	\$0	\$78,962	NA
Corp Yard 2	2360 Bisso Ln	NA	133	365,160	\$52,424	9,996	\$12,214	\$64,638	NA
Salvio St Garage	2255 Salvio St	NA	77	546,979	\$63,417	0	\$0	\$63,417	NA
Todos Santos Garage	2051 Salvio St	NA		275,675	\$43,612	0	\$0	\$43,612	NA
Meadow Homes Swimming Pool	1371 Detroit Ave	NA	31	76,490	\$12,319	4,645	\$5,558	\$17,877	NA
Corp Yard 1	1425 Gasoline Alley	NA	24	45,520	\$7,482	818	\$1,142	\$8,624	NA
Golf Course	4050 Port Chicago Hwy	NA		25,955	\$4,434	0	\$0	\$4,434	NA
City-wide Energy Usage:									
Streetlights	City-wide	NA		4,435,347	\$568,134	0	\$0	\$568,134	NA
Traffic Controllers	City-wide	NA		535,080	\$93,156	0	\$0	\$93,156	NA
Park Lights	City-wide	NA	231	495,908	\$86,754	0	\$0	\$86,754	NA
Pumps	City-wide	NA	148	608,289	\$80,196	0	\$0	\$80,196	NA
Miscellaneous Low Usage ²	City-wide	NA		79,190	\$14,097	878	\$1,302	\$15,399	NA
Irrigation	City-wide	NA		19,948	\$11,003	0	\$0	\$11,003	NA
Maximum Value		68,300	462	4,435,347	\$568,134	149,759	\$146,235	\$568,134	\$8.09
Minimum Value		900	20	16,089	\$2,777	0	\$0	\$3,123	\$1.24
Total		173,140		12,492,730	\$1,701,750	237,178	\$247,790	\$1,949,541	

¹ These facilities were not analyzed on a per square foot basis because the energy use of these facility types typically covers area outside the square footage of the main building. A square footage analysis would therefore not provide an accurate comparison to other facilities.

² Includes 20 miscellaneous gas and electric accounts with less than \$3,000 in annual energy cost.

**Note: Please see the appendix at the end of this report for a listing of the utility accounts that were used to generate the analysis of each facility listed above.

City of Concord

SCOPE AND LIMITATIONS

This Energy Assessment Report covers City of Concord facilities in Pacific Gas and Electric Company's (PG&E) service territory. Energy data are taken from PG&E's electric and gas billing records, and cover the period from July 2006 through June 2007.

ABAG Energy Watch has analyzed data on 23 of the City's facilities. These facilities range in size from 900 square feet to 68,300 square feet. The total square footage of the 23 facilities is 173,140 square feet.

Many factors affect the energy use in different facilities, including age, type of HVAC and lighting equipment, facility occupancy and hours, and plug loads (such as task lighting, computers, and copiers). ABAG Energy Watch's analysis uses only the total square footage and billing data (electricity and gas) to provide an overview of energy use in your facilities and help identify individual locations with the potential for energy efficiency improvements. Data at this level are not detailed enough to identify specific energy inefficiencies within individual facilities, but are useful to provide an agency-wide energy assessment.

ABAG Energy Watch benchmark values are included for several of the facilities analyzed. These benchmark values were developed based on energy and power data per square foot for specific government facility types within the Bay Area¹ and represent the **median** energy cost or energy use for these facility types. Benchmark values, which are represented in the graphs by bold (blue) lines, can help the City understand how its facilities are using energy compared to other similar facilities in the Bay Area. The table below shows that 11 Concord facilities that have been compared to ABAG Energy Watch benchmark values, and what facility types were assumed for each.

¹ Note that ABAG Energy Watch benchmark values were developed with data for 37 local governments in the Bay Area and are only intended to be used as a general comparison. Individual facility energy and power usage is dependent on a number of factors, many of which are not related to energy efficiency.

Concord Facility Name	ABAG Energy Watch benchmark value facility type
Concord Senior Citizens Center	Community/Rec Center
Clayton Police Station	Police
Main Police Station	Police
Willow Pass Recreation Center	Community/Rec Center
Monument Police Station	Police
Civic Center	City Hall/Admin Building
Keller House	Community/Rec Center
RDA Offices	Office
Human Resources Department	Office
Solano Police Station	Police
First Five	Health Facility

Once individual facilities with the greatest potential for energy savings are identified, a more detailed analysis or energy audit of those facilities can be performed to identify the specific sources of the inefficiencies. Further analysis can identify inefficient equipment, malfunctioning equipment, equipment not operating as designed, or improper operational procedures.

This assessment is presented in sections that highlight the main points of the analysis and include graphic representations of the utility data. A table showing detailed energy data for the facilities is included at the end of the Executive Summary.

City of Concord

FACILITY ENERGY COSTS

Figure 1 on the following page shows the annual energy cost per building for each facility analyzed in this assessment. Figure 2 shows the annual energy cost per square foot at each facility for which this information was available.

Energy Cost

- The building with the highest annual energy cost of \$294,473/yr is the Main Police Station.
- The building with the second highest annual energy cost of \$202,624/yr is the Concord Community Park & Pool.

Energy Cost Per Square Foot

- The building with the highest annual energy cost per square foot of \$8.09/ft²-yr is the Newhall Park Maintenance Office.
- The building with the second highest annual energy cost per square foot of \$7.02/ft²-yr is the Printing Services.

Figure 1: Annual Energy Costs per Facility

**Energy Costs at the Main Police Station and Concord Comm. Park & Pool are beyond the scale of this chart

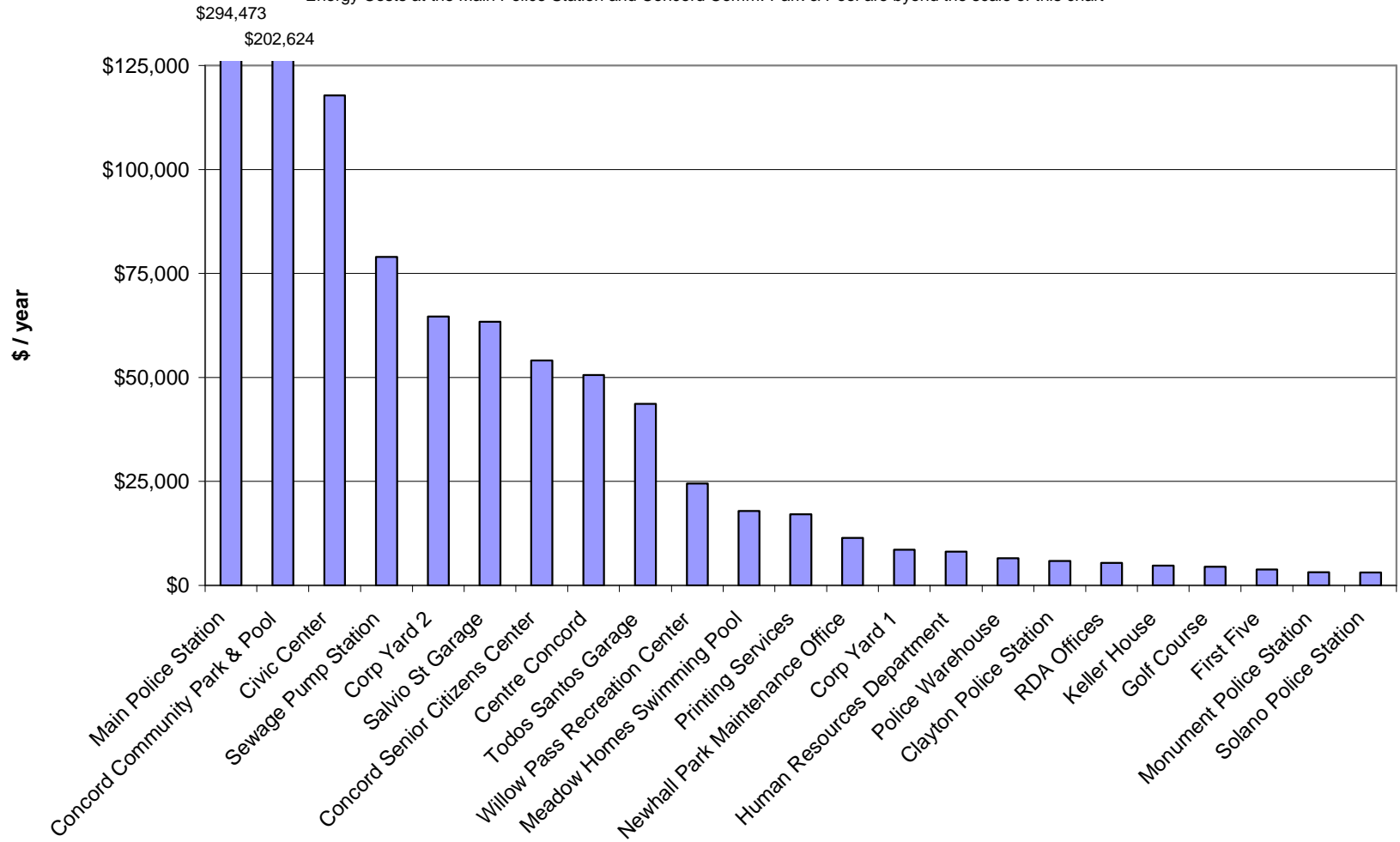
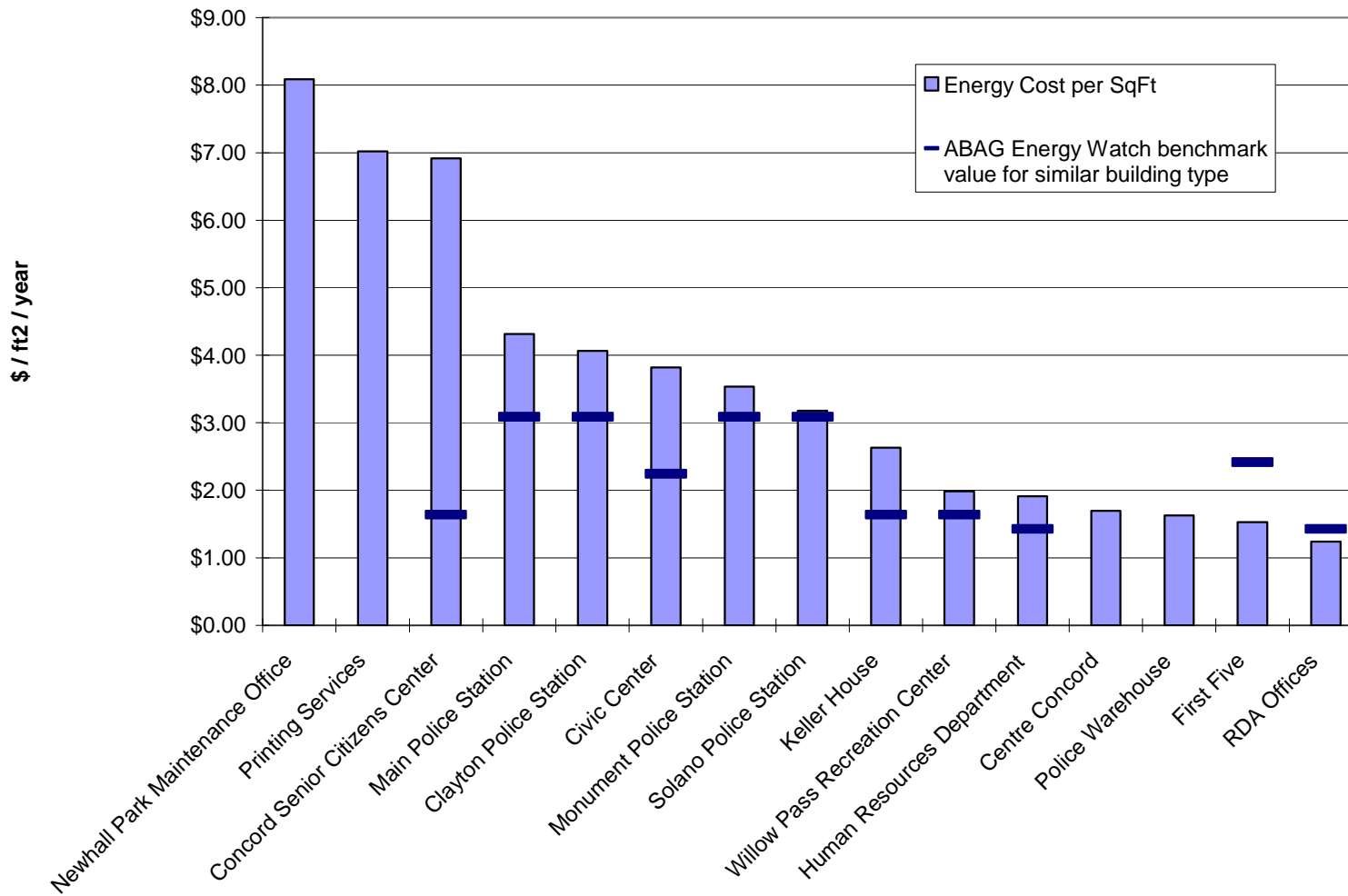


Figure 2: Annual Energy Costs per Square Foot



City of Concord

FACILITY ELECTRIC CONSUMPTION

The 23 facilities analyzed in this report use a total of 6,318,967 kWh annually. The following is a summary of the data shown in Figures 3 and 4, which analyzes annual electricity use per facility.

Electricity Use

- The building with the highest annual energy use of 2,027,555 kWh/year is the Main Police Station.
- The building with the second highest annual electricity consumption of 784,549 kWh/year is the Civic Center.

Electricity Use Per Square Foot

- The building with the highest annual electricity consumption per square foot of 50.3 kWh/ft²-year is the Newhall Park Maintenance Office.
- The building with the second highest annual electricity consumption per square foot of 36.8 kWh/ft²-year is the Concord Senior Citizens Center.
- By comparison, the ABAG Energy Watch benchmark value for community/rec centers is 7.32 kWh/ft²-year.

Figure 3: Annual Electricity Use Per Facility

**Electricity Use at the Main Police Station is beyond the scale of this chart

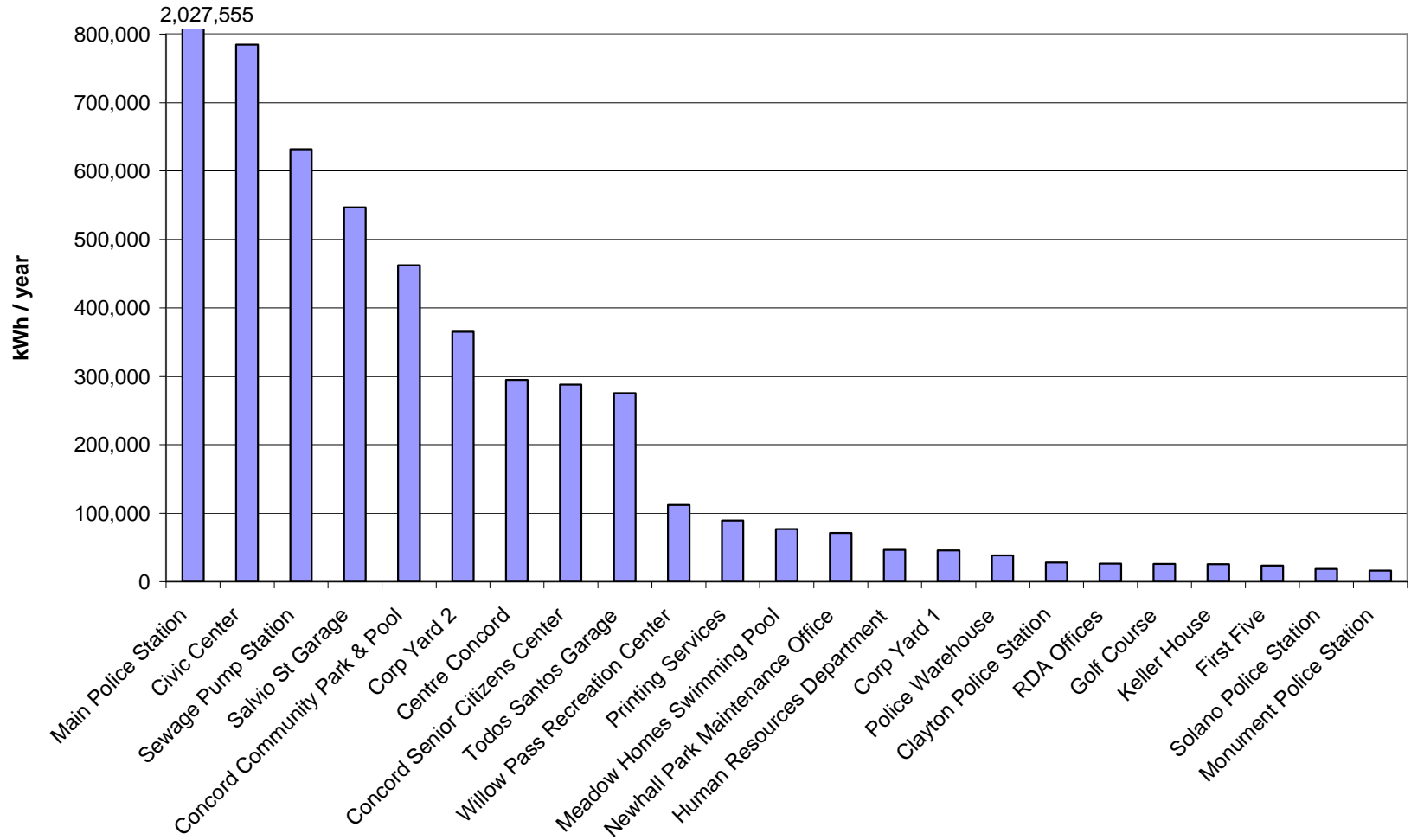
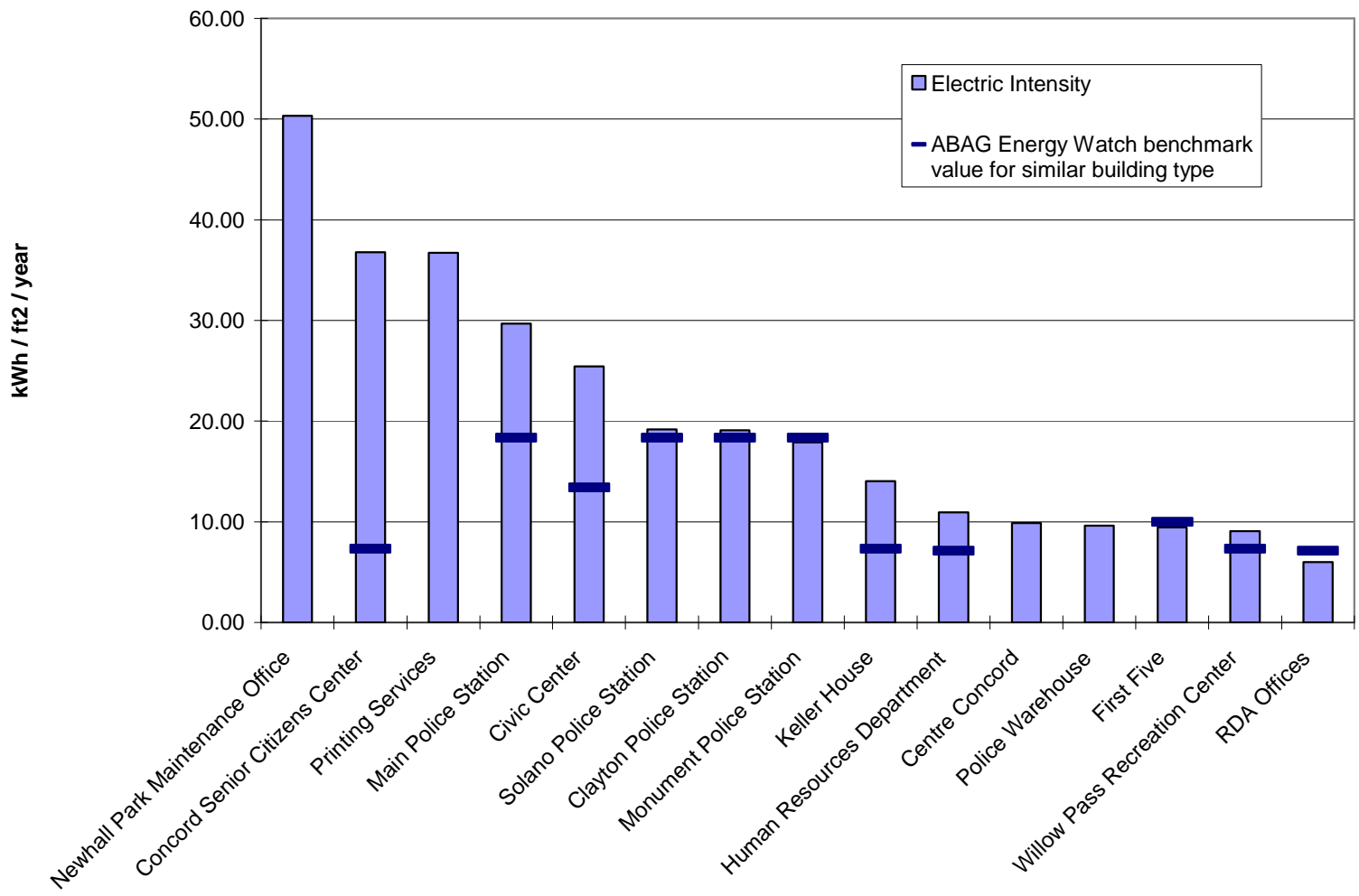


Figure 4: Annual Electricity Use Per Square Foot



City of Concord

FACILITY POWER USE

Maximum demand (measured in kilowatts) determines demand charges, which can be a significant part of the total electric bill. Demand is the rate at which electricity is delivered at a given instant or averaged over some period of time. The maximum demand at the facility impacts PG&E's generating capacity requirements and is therefore reflected in energy costs.

Demand charges fluctuate and typically peak in the afternoon during summer months. They can be a significant part of the total electric bill, adding up to as much as \$16 per kilowatt, and can be lowered by changing equipment and operating schedules. For example, thermal energy storage (TES) systems shift cooling energy use to non-peak times, saving money on electric bills by avoiding peak demand charges. Lighting retrofits can also save on demand charges. Increasing daylighting or replacing T-12 fluorescent fixtures, or even previous generation T-8 fluorescent fixtures, with latest generation T-8 fixtures and dimmable electronic ballasts can reduce the lighting power density. Efficient lighting also reduces the load on air conditioning systems, further reducing energy and demand.

Peak Demand

Figure 5 shows each facility's maximum demand for facilities which are demand metered.

- The highest demand is 462 kW at the Main Police Station.
- The second highest demand is 250 kW at the Civic Center.

Power Density

Figure 6 uses *power density* (measured in W/ft²) in order to compare electricity demands at facilities of different sizes, for facilities where square footage information was available and for facilities that are demand metered.

- The highest power density is 18.9 W/ft² at the Printing Services.
- The second highest power density is 17.0 W/ft² at the Newhall Park Maintenance Office.

Figure 5: Peak Demand of Demand Metered Facilities (Annual)

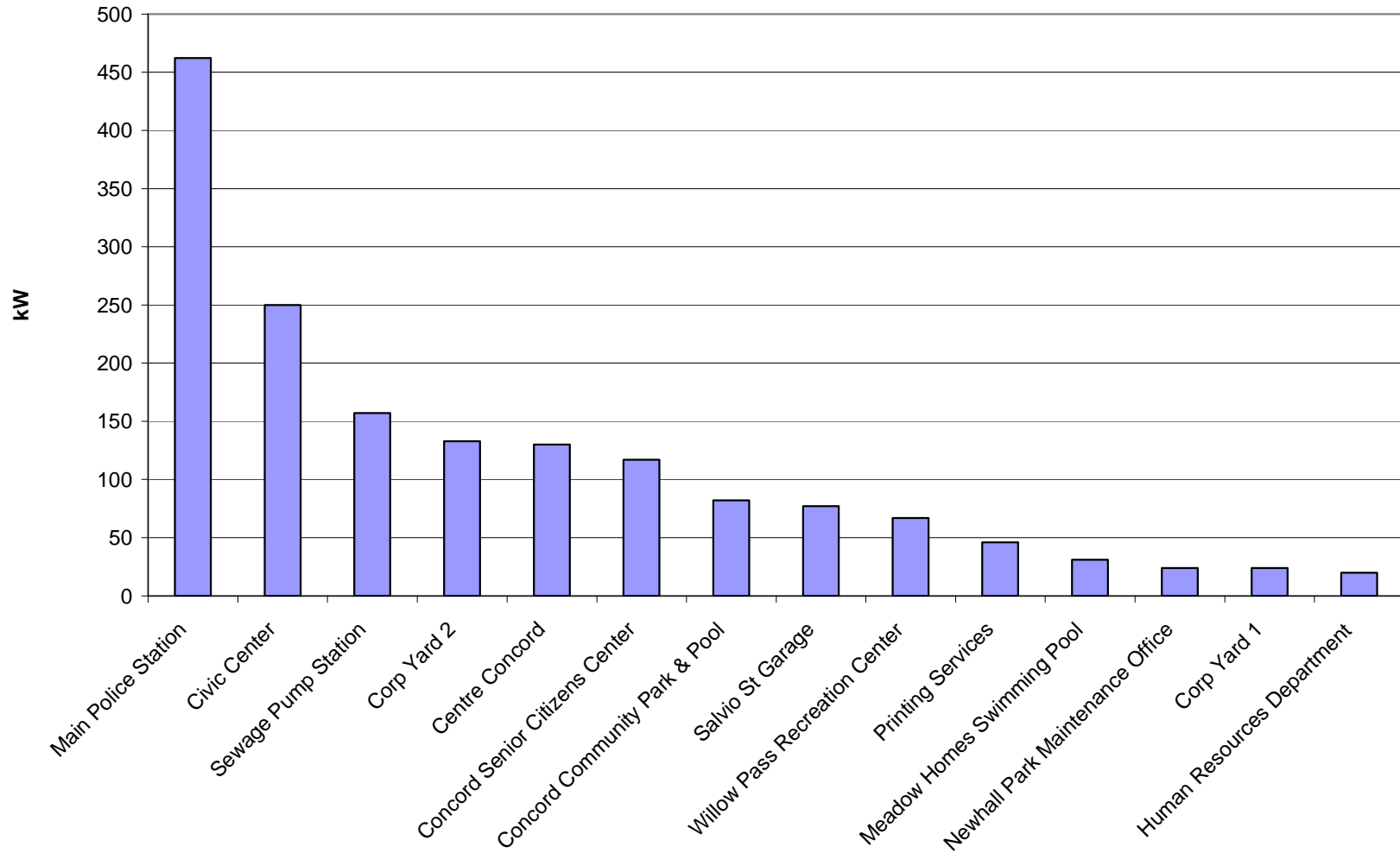
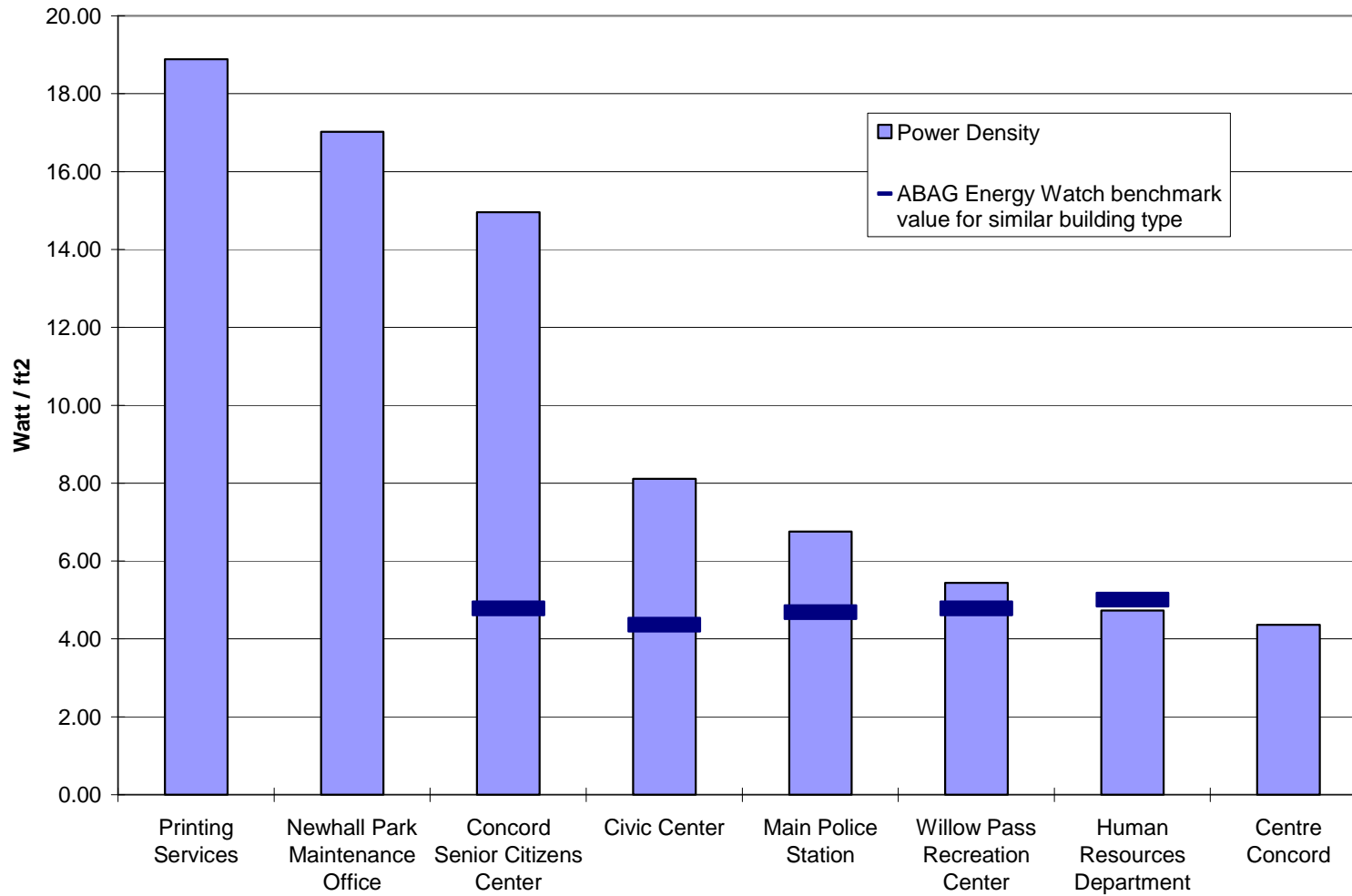


Figure 6: Power Density of Demand Metered Facilities



City of Concord FACILITY GAS USE

The 23 facilities analyzed in this report use a total of 236,300 therms annually. The following is a summary of the data shown in Figures 7 and 8, which analyzes annual natural gas consumption per facility.

Natural Gas Use

- The highest therm consumption is 149,759 therms/year at the Concord Community Park & Pool.
- The second highest therm consumption is 37,890 therms/year at the Main Police Station.

Natural Gas Use Per Square Foot

- The highest therm consumption per square foot is 1.43 therms/ft²-year at the Concord Senior Citizens Center.
- By comparison, the ABAG Energy Watch benchmark value for community/rec centers is 0.24 therms/ft²-year.
- The second highest therm consumption per square foot is 0.66 therms/ft²-year at the Clayton Police Station.
- By comparison, the ABAG Energy Watch benchmark value for police stations is 0.43 therms/ft²-year.

Figure 7: Annual Gas Use Per Facility

**Gas Use at the Concord Comm. Park & Pool and Main Police Station is beyond the scale of this chart

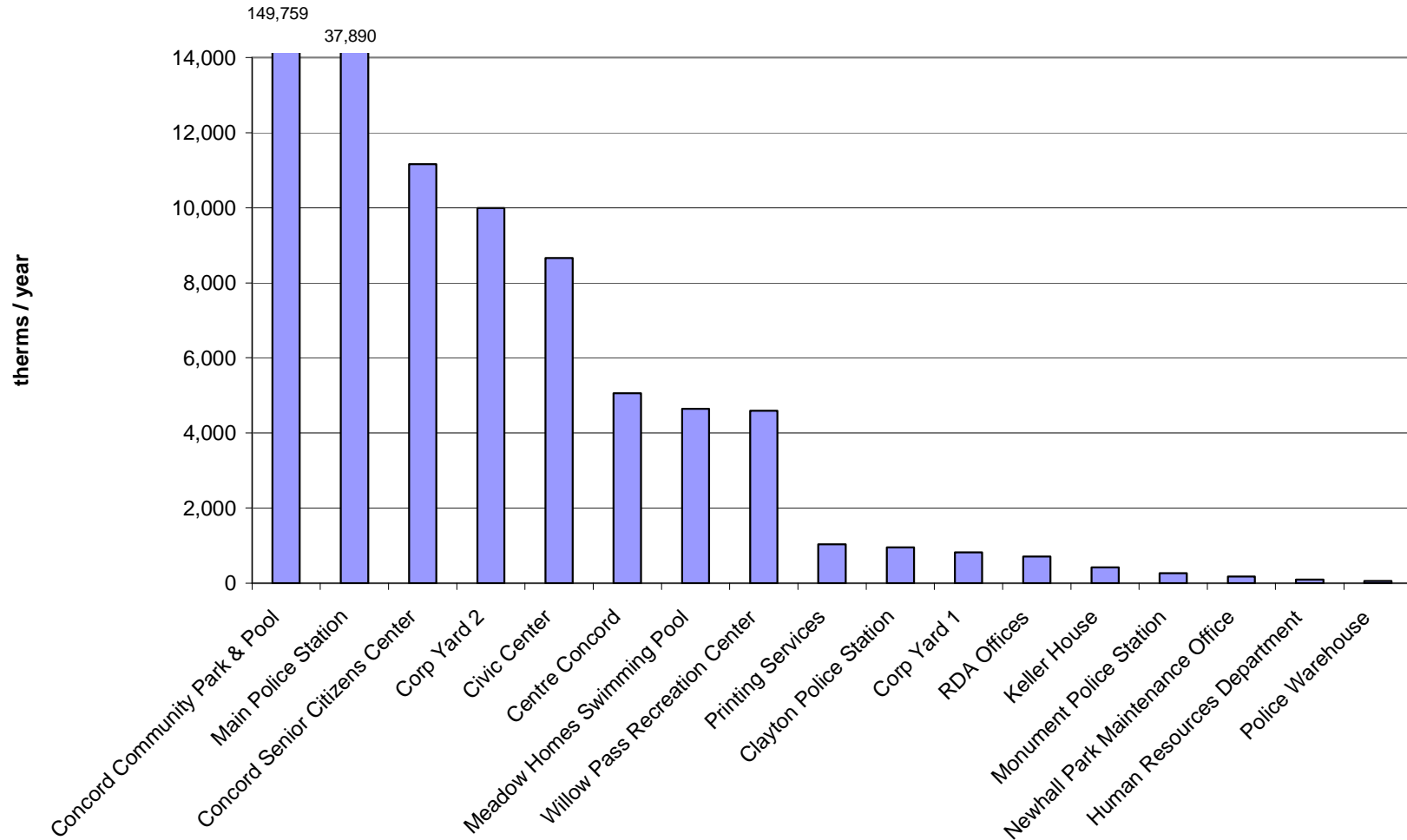
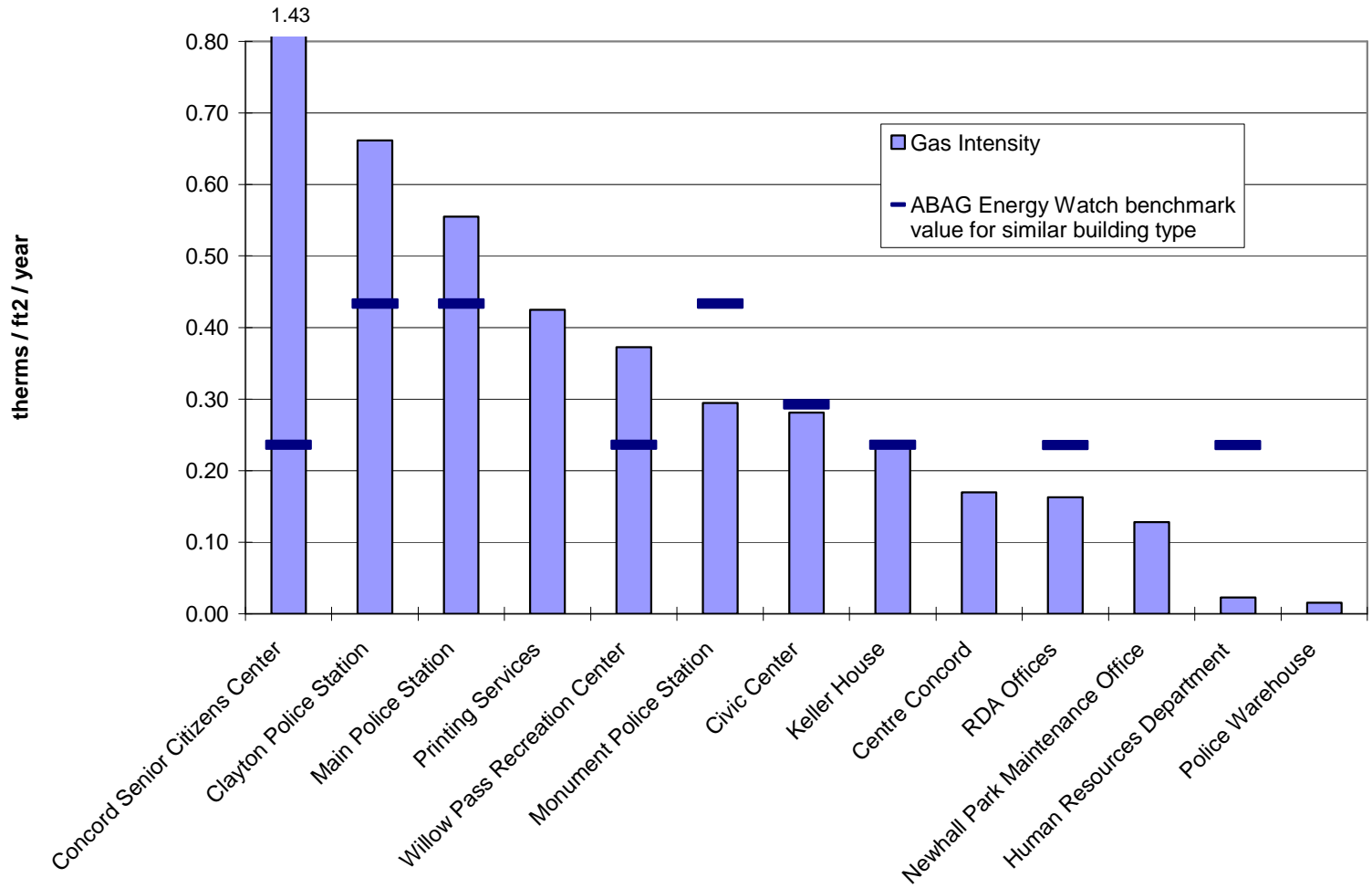


Figure 8: Annual Gas Use Per Square Foot

**Gas Use per square foot at the Concord Senior Center is beyond the scale of this chart



Energy Assessment Report Appendix - City of Concord

Facility Name	Address (from PG&E data)	PG&E Service Description (if available)	Electric or Gas	Rate Schedule	Service Account ID #	Meter # (if available)	Annual Cost
Civic Center	1950 Parkside Dr	City Hall	E	A10S	4543452105	5P2590	\$108,033
	1950 Parkside Dr	Civic Center	G	GNR1	5928822105	36890821	\$9,759
RDA Offices	1601 Sutter St # 1	Commercial Hse Mtrs	G	GNR1	5928822050	877717E	\$456
	1601 Sutter St # 2	Commerical Hse Mtrs	E	A1	4543452040	H16238	\$4,409
	1601 Sutter St # 2	Commerical Hse Mtrs	G	GNR1	5928822045	721734G	\$564
Keller House	1760 Clayton Rd		G	GNR1	5400744860	855472C	\$536
	1760 Clayton Rd		E	A1	5400744917	0H9112	\$4,189
First Five	1736 Clayton Rd	Resource Center	E	A1	9828742524	133M37	\$3,805
Newell Pkwy Maint Ofc	South End/Newell Pkwy	Maint Ofc	E	A10S	1762154160	312R34	\$11,097
	South End/Newell Pkwy	Maint Ofc	G	GNR1	5928822130	461871V	\$302
Willow Pass Rec Center	Salvio St N/O 6Th St	Comm Ctr	E	A10S	2616367020	X09396	\$19,084
	Salvio-Farm Bureau Rd	Rec Center	G	GNR1	5928822025	44235587	\$4,536
Human Resources Dept	2974 Salvio St	Ofc	E	A10S	4543452110	60784T	\$7,888
	2974 Salvio St	Rec Hall	G	GNR1	5928822110	748676E	\$201
Printing Services	2730 Parkside Cir		E	A10S	3340528145	X09284	\$14,083
	Parkside Cir	Bldg A (E)	E	A1	4543452080	T21672	\$1,677
	Parkside Cir Bldg D	Park Ofc (G)	G	GNR1	5928822100	749138K	\$1,339
Centre Concord	5298 Clayton Rd	Community & Citiarts	E	A10S	2616367065	X09397	\$44,857
	5298 Clayton Rd	Community & City Acts	G	GNR1	5928822120	41084549	\$5,705
Concord Senior Ctznz Cntr	2727 Parkside Cir	Senior Center	E	A10S	2175024005	R62597	\$40,918
	2727 Parkside Cir		G	GNR1	5928822320	41082129	\$13,152
Clayton Police Station	4467 Clayton Rd		G	GNR1	6918451262	49691367	\$1,248
	4467 Clayton Rd		E	A1P	6918451482	20T187	\$4,592
Main Police Station	1350 Galindo St	Police Station	G	GNR1	5928822020	47275855	\$42,014
	1350 Galindo St	Police Station	E	E19SX	6918451020	M07542	\$251,767
Police Warehouse	1320 Galindo St	Police Whse	G	GNR1	5928822015	56151667	\$159
	1352 Galindo St	Police Dept Warehouse	E	A1	6918451015	1815J6	\$6,329
Monument Police Station	1500 Monument Blvd Ste F16	Police Substation	E	A1P	6918451125	T00252	\$2,777
	1500 Monument Blvd Ste F16	Police Substation	G	GNR1	6918451271	44068838	\$408
Solano Police Station	2166 Solano Way	Police Field Office	E	A1P	6918451030	5320R4	\$3,123
Sewage Pump Station	2050 Century Blvd	Sewer Pump Plant	E	E19SV	4543452025	R04370	\$79,395
Corp Yard 2	2360 Bisso Ln	Serv Gar Maint	E	A10S	4543452075	R79400	\$24,287
	2360 Bisso Ln	Svc Garage Maint	G	GNR1	5928822085	55380886	\$6,701

Energy Assessment Report Appendix - City of Concord

Facility Name	Address (from PG&E data)	PG&E Service Description (if available)	Electric or Gas	Rate Schedule	Service Account ID #	Meter # (if available)	Annual Cost
Corp Yard 2, continued	Bisso Ln	Corp Yard	E	A10S	4543452070	R99873	\$28,137
	Bisso Ln	Corp Yard G	G	GNR1	5928822070	36872847	\$4,356
	Bisso Ln	Garage Corp Yard	G	GNR1	5928822075	57121504	\$1,157
Corp Yard 1	1425 Gasoline Alley	Scene Shop	E	A1P	1762154060	5805T5	\$7,482
	1425 Gasoline Alley	Scene Shop	G	GNR1	5928822080	25721443	\$1,142
Concord Cmty Park & Pool	3500 Cowell Rd	Concession Booth	E	A1	1762154125	4602H7	\$1,028
	3500 Cowell Rd	Bocci Ball Ct Bldg	E	A1	1762154130	7G5919	\$514
	3501 Cowell Rd		E	E19SV	2616367081	0707R5	\$54,847
	3501 Cowell Rd	Standby Boilers	G	GNR1	5928822115	37896837	\$140,870
	3501 Cowell Rd		G	GNR1	7939280468	36464197	\$5,350
Meadow Homes Pool	1371 Detroit Ave	School Pool E	E	A10S	2616367050	T57413	\$12,319
	1371 Detroit Ave	Swim Pool G	G	GNR1	5928822035	39298215	\$5,543
Golf Course	4050 Port Chicago Hwy	#100D Medical Ofc	E	OL1	2616367055		\$215
	4050 Port Chicago Hwy	Battery Charger Carts	E	A1	2616367070	722A32	\$463
	4050 Port Chicago Hwy	Maint Bldg Golf Course	E	A1	2616367075	93E829	\$2,037
	4050 Port Chicago Hwy	Maint Bldg Golf Course	E	A1	2616367080	8A9866	\$1,719
Todos Santos Garage	2051 Salvio St	Parking Garage	E	A1P	4543452045	13465R	\$43,493
Salvio St Garage	2255 Salvio St	Parking Garage	E	E19SW	4543452050	29089R	\$63,243
Miscellaneous Low Usage	2000 Kirker Pass Rd	Police Radio Repeatr	E	A1	6918451035	1586T6	\$1,607
	2750 Parkside Cir # B	Ofc	E	A1P	1762154080	6436T9	\$402
	Parkside Cir	Bldg C	G	GNR1	5928822090	44151195	\$737
	2217 Chalomar Rd # A	Ygnacio Vly Child Care	E	A1	2616367060	71M177	\$1,806
	1765 Galindo St	Rdvlpmnt Agency Vcnt	G	GNR1	125811005	25721630	\$467
	1765 Galindo St	Vacant	E	A1	4543452015	M32017	\$2,155
	1030 Detroit Ave		G	GNGV2	8043403005		\$0
	1934 Mount Diablo St	Pedestal-Lighting	E	A1	9345487140	6K8975	\$98
	1951 Century Blvd	Sewer Pump Plant G	G	GNR1	5928822040	583991J	\$97
	1958 Century Blvd	Maintenance Bldg	E	A1P	4543452030	66T256	\$1,298
	2028 Salvio St	Decorative Lighting	E	A1	9345487145	70G419	\$1,263
	2204 Concord Blvd	Pedestal-Lighting	E	A1	9345487170	6K8976	\$195
	2740 E Olivera Rd	Rest Room	E	A1	1762154020	9B0661	\$265
	3701 Treat Blvd	Limeridge Park Bldg	E	A1	1762154105	70095E	\$2,529
	4700 Ygnacio Valley Rd	Rec Area	E	A1	1762154145	77K279	\$468

Energy Assessment Report Appendix - City of Concord

Facility Name	Address (from PG&E data)	PG&E Service Description (if available)	Electric or Gas	Rate Schedule	Service Account ID #	Meter # (if available)	Annual Cost
Misc Low Usage, continued	Clytn Rd Median, 100 Ft E Denkngr	#103	E	A1F	9512154075		\$101
	E/S C C Hwy 900 S/O	Telemeter	E	A1	4543452035	61R211	\$249
	Hwy 4 At Solano Way	Sewage Flow Meter	E	A1F	4543452020		\$184
	In Front Of 1982	City/Decorative Light	E	A1	9345487135	5M9783	\$98
	S/W Crnr Pine Hillw & Rolling Wood	#103 D & I 103 522530	E	A1	4543452115		\$1,378
Pumps	11 Accounts						
Park Lights	12 Accounts						
Irrigation	80 accounts						
Streetlights	7 accounts						
Traffic Controllers	149 Accounts						