



Office of the City Manager

PUBLIC HEARING

May 26, 2015

To: Honorable Mayor and Members of the City Council

From:  Christine Daniel, City Manager

Submitted by: Andrew Clough, Director, Public Works

Subject: Fees for Use of Electric Vehicle Charging Stations on Municipal Property

RECOMMENDATION

Conduct a public hearing and upon conclusion, adopt a Resolution establishing session fees of \$1.50 per hour for public use of new Level 2 electric vehicle (EV) charging stations on municipal property.

FISCAL IMPACTS OF RECOMMENDATION

Establishing session fees allows the City to recover expenditures associated with the ownership and public use of 6 new dual-port Level 2 EV charging stations scheduled to be installed in FY 2015. The cost of the charging stations and most of the installation¹ (approximately \$75,000 in goods and services) is being covered through Berkeley's participation in the Bay Area Charge Ahead Project 2 (BayCAP 2) project, which is funded by a grant from the California Energy Commission (CEC).

EV charging stations will be installed at the Telegraph Channing Garage, Oxford Garage, and at the Berkeley Marina by June 2015. Grant conditions through the BayCAP 2 project require that installed EV charging stations will incorporate fees to sustain charging station operations and optimize the use of charging sites.

On-going expenses associated with the EV charging stations include: energy costs (electricity and demand charges); estimated annual maintenance (\$375 per port)²; fees from the station manufacturer and service provider (ChargePoint), for network service (annual \$230 per port); and the collection of session fees (10% of the session fees). The network service fee covers software upgrades, station programming, cellular connections, and 24/7 driver support.

The recommended fee of \$1.50 per hour is intended to lower the expenses, as detailed in Attachment 3: Projected Annual Expenses and Revenue for EV Charging Stations.

¹ A transformer upgrade required at the Oxford Garage to support the addition of EV charging stations at that location, and bollard protection for the EV charging stations at both garages will come from the Public Works Department Off-Street Parking Fund 835.

² Although maintenance expenses will likely be connected to frequency of EV charging station use.

Collected fees will be deposited into the Off-Street Parking Fund (Fund 835) and the Marina Operations/Maintenance Fund (Fund 825).

CURRENT SITUATION AND ITS EFFECTS

The City currently operates two Level 2 charging stations in the Center Street Garage, which are available to the general public, and there is no fee for use of these charging stations beyond the garage parking fee. Public EV charging stations within the garage limit use of the charging stations to a maximum of 4 hours during daytime hours (7:00 am – 6:00 pm). Of these two EV charging stations, usage data is only available at the one ChargePoint station, which City CarShare installed and donated to the City of Berkeley. Data on its use is collected and transmitted to the City on a regular basis. The following table is a summary of this Center Street Garage ChargePoint EV Charger average use during the period July 2013 to February 2015:

Average EV Charger Use	Monthly	Daily
Charger Use	260 hours	8.5 hours
Charger Electrical Use	700 kWh	23 kWh
# Charging Sessions	75	3
Length of Sessions	225 hours	3 hours ³

Since they were installed in 2013, the City has paid for the electricity associated with the Center Street Garage public EV charging stations. There have been minimal maintenance costs and, as a result of operating the EV charging stations without fees, there have been no network service fees or transaction fees.

Six new dual-port Level 2 EV charging stations will be installed at Telegraph Channing Garage, Oxford Garage, and the Berkeley Marina through the BayCAP2 program. The CEC requires that participants implement a plan to optimize the use of the charging sites to allow multiple EVs to use the charging equipment during a typical day, and to prohibit utilization of a charging station “beyond a reasonable period of time.” As a BayCAP participant, the City has agreed to implement a pricing plan and a method of encouraging charging station turnover.

The proposed fee satisfies the CEC grant conditions and provides a simple fee structure that can be applied to other future EV charging station installations on municipal property. Due to the expense involved in retrofitting existing charging stations to enable fee collection, and the upcoming Center Street Garage Replacement Project, staff recommends retaining the existing EV charging stations without a use fee until the Garage is demolished and rebuilt.

³ The average vehicle is actually charging for about 2 hours of the nearly 3 hour charging session; the remaining time the vehicle is still plugged into the EV charging station but is no longer drawing electricity, likely because the battery is already fully charged.

BACKGROUND

Staff considered guidance provided to BayCAP participants (Attachment 4) and site-specific conditions in setting the EV charging station fee of \$1.50 per hour. As already noted, fixed costs include annual network service fees, annual maintenance expense, and ChargePoint fees.

Electric utility fees associated with use of EV charging stations are difficult to estimate because they vary depending on the PG&E rate schedule, time of day, day of the week, and season (summer or winter) in which charging occurs. Electric utility fees include both energy charges for the electricity consumed (\$ per kWh) and demand charges (\$ per kW). Commercial customers, including parking garages, can have large variations in their electrical use, and so are assessed demand charges that cover PG&E's costs associated with keeping equipment (transformers, wires, substations, etc.) on standby to allow for enough electricity to be supplied during peak consumption periods. Demand charges are assessed based on the highest average kW measured in a 15-minute interval during the billing period. Currently, demand charges in the parking garages are caused by simultaneous use of lighting, elevators, gates, and other existing equipment. In the future, if charging stations are used at the same time, their electrical consumption will add a marginal increase to the existing demand charges.

The proposed fee of \$1.50 per hour assumes an average energy charge of \$0.15 per kWh for 350 days of the year, and an average energy charge of \$0.90 per kWh for the remaining days. This increased energy charge for 15 days per year reflects average pricing expected during the Peak Day Pricing rate schedule that PG&E will begin implementing later this year. Peak Day Pricing rates, designed to meet State requirements for encouraging energy conservation when electrical demand is high, dramatically increase energy charges on 9 – 15 Peak Day Pricing Event Days per year.

The \$1.50 per hour fee also assumes that the marginal demand charges generated by EV charging station use will be triggered by simultaneous use of two EV charging ports on a single electrical meter, at each charging port's maximum output of 7.2 kW, and at an average demand charge of \$12 per kW.

Finally, calculations for the proposed charging fee assume that each EV charging port is used for an average of two 2-hour charging sessions per day. The \$1.50 per hour fee will give users an incentive to unplug and move their vehicles when done charging (resulting in average charging sessions of 2 hours).

With the installation of the EV charging units, staff will closely monitor use patterns and costs. Based on the findings, staff may recommend to City Council implementation of a data driven analysis fee structure similar to the goBerkeley structure.

ENVIRONMENTAL SUSTAINABILITY

Providing EV charging stations for public use directly supports the City's General Plan, Policy T-19, which calls for placing stations at major parking facilities and employment centers, and responds to Berkeley's Climate Action Plan, Goal 8, of encouraging low-

carbon vehicles and fuels. Assessing a reasonable fee for the use of public EV charging stations encourages responsible use of the charging resource and the electricity that supplies it while promoting station turnover to allow access by greater numbers of potential users.

RATIONALE FOR RECOMMENDATION

The proposed fee is expected to reduce the expenses that will be associated with providing, operating, and maintaining the EV charging stations to be installed through Berkeley's participation in the BayCAP 2 program. It is a simple fee structure based on site-specific assumptions of likely EV charging station use in Berkeley.

ALTERNATIVE ACTIONS CONSIDERED

A variety of fee structures were analyzed, including fees with session activation costs and differing usage fees, both on a time-basis (\$/hour) and an energy-basis (\$/kWh). The proposed time-based fee (\$/hour), rather than an energy-based fee (\$/kWh), for charging station use was selected to encourage turnover of EV charging stations, in combination with signage limiting daytime use. With an energy-based fee, users that are done charging their vehicles have no financial incentive to unplug and move because their fees stop when the electricity flow ceases, even if the vehicle remains plugged, thus preventing access to the EV charging port by other potential users.

Consideration was also given to having a lower nighttime fee, reflecting lower electrical demand and rates. However, none of these alternatives appear to reduce the expected expenditures as effectively. Staff believe that periodic data analysis reviews should be conducted to ensure that the recommended fee structure achieves and remains a self-sustaining program status.

CONTACT PERSON

Farid Javadel, Transportation Manager, Public Works, 981-7061

Danette Perry, Parking Services Manager, Public Works, 981-7057

Sarah Moore, Associate Planner, Planning Department, 981-7494

Attachments:

- 1: Resolution
- 2: Notice of Public Hearing
- 3: Projected Annual Expenses and Revenue for EV Charging Stations
- 4: BACC Fee Structure Recommendations for EV Charging

RESOLUTION NO. ##,###-N.S.

ESTABLISHMENT OF A FEE FOR USE OF EV CHARGING STATIONS

WHEREAS, City Council directed the City Manager to aggressively seek funding to install Level 2 electric vehicle (EV) charging stations in the Telegraph Channing Garage and Oxford Garage on September 17, 2013; and

WHEREAS, the City of Berkeley, along with other communities, participated in a regional collaboration, known as the BayCAP 2, to seek funding for EV charging stations from the California Energy Commission (CEC); and

WHEREAS, the CEC awarded BayCAP 2 a grant of \$474,052 for the deployment of 37 dual-port Level 2 EV charging stations across 18 locations in 10 municipalities including 6 in Berkeley at the Telegraph Channing Garage (3 stations), Oxford Garage (2 stations), and Berkeley Marina (1 station) on May 14, 2014; and

WHEREAS, Council authorized the City Manager to accept the CEC grant for these EV charging stations on July 8, 2014; and

WHEREAS, BayCAP 2 participants, in keeping with CEC requirements, agreed to incorporate fees to sustain charging station operations and optimize the use of charging sites; and

WHEREAS, the proposed fee reduces the energy costs (electricity and demand charges), network service fees, maintenance, and ChargePoint fees associated with operating the EV charging stations being installed through the BayCAP project; and

WHEREAS, the revenue generated from the fee will be deposited into the Off-Street Parking Fund (Fund 835) and the Marina Operations/Maintenance Fund (Fund 825).

NOW THEREFORE, BE IT RESOLVED by the Council of the City of Berkeley that the session fees for public use of new Level 2 electric vehicle (EV) charging stations on municipal property are established at \$1.50 per hour.

**NOTICE OF PUBLIC HEARING
BERKELEY CITY COUNCIL
ESTABLISHING FEES FOR USE OF ELECTRIC VEHICLE (EV)
CHARGING STATIONS**

Notice is hereby given by the City Council of the City of Berkeley that a public hearing will be conducted by said city council of the City of Berkeley at which time and place all persons may attend and be heard upon the following:

The Department of Public Works is proposing to establish a \$1.50 per hour fee for public use of new Level 2 electric vehicle (EV) charging stations on municipal property.

The hearing will be held on May 26, 2015 at 7:00 p.m. in the City Council Chambers, 2134 Martin Luther King, Jr. Way.

For further information, please contact Danette Perry at 510-981-7057.

A copy of the agenda material for this hearing will be available on the City's website at www.CityofBerkeley.info as of **May 14, 2015**.

Written comments should be mailed or delivered directly to the City Clerk, 2180 Milvia Street, Berkeley, CA 94704, in order to ensure delivery to all Councilmembers and inclusion in the agenda packet.

Communications to the Berkeley City Council are public record and will become part of the City's electronic records, which are accessible through the City's website. **Please note: e-mail addresses, names, addresses, and other contact information are not required, but if included in any communication to the City Council, will become part of the public record.** If you do not want your e-mail address or any other contact information to be made public, you may deliver communications via U.S. Postal Service or in person to the City Clerk. If you do not want your contact information included in the public record, please do not include that information in your communication. Please contact the City Clerk at 981-6900 or clerk@cityofberkeley.info for further information.

If you challenge the above in court, you may be limited to raising only those issues you or someone else raised at the public hearing described in this notice, or in written correspondence delivered to the City of Berkeley at, or prior to, the public hearing. Background information concerning this proposal will be available at the City Clerk Department and posted on the City of Berkeley webpage at least 12 days prior to the public hearing.

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Per Government Code 6062A

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I hereby certify that the Notice for this Public Hearing of the Berkeley City Council was posted at the display case located near the walkway in front of Council Chambers, 2134 Martin Luther King Jr. Way, as well as on the City's website, on May 14, 2015.

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Mark Numainville, CMC, City Clerk

**Standard Pricing**

| <b>Expenses</b>                   | <b>Per Charging Port Basis</b> | <b>Notes</b>                                                                                                                |
|-----------------------------------|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| Network Service Fee               | \$230                          | \$230 per port per year                                                                                                     |
| ChargePoint Fee                   | \$219                          | 10% of collected charging session fees                                                                                      |
| Energy Charges                    | \$693                          | Assumes two 2-hour charging sessions per day @ 3.3 kW average, \$0.15/kWh average (@ 350 days)                              |
| Energy Charges (Peak Day Pricing) | \$178                          | Assumes two 2-hour charging sessions per day @ 3.3 kW average, \$0.90/kWh average, Peak Day Pricing rate (@ 15 days a year) |
| Demand Charges                    | \$504                          | Assumes marginal demand charge based on 14 kW at an average of \$12/kW (at a meter with 4 charging ports)                   |
| Maintenance                       | \$375                          | Assumes annual dual-port charging station maintenance of \$750                                                              |
| <b>Total</b>                      | <b>\$2,199</b>                 |                                                                                                                             |

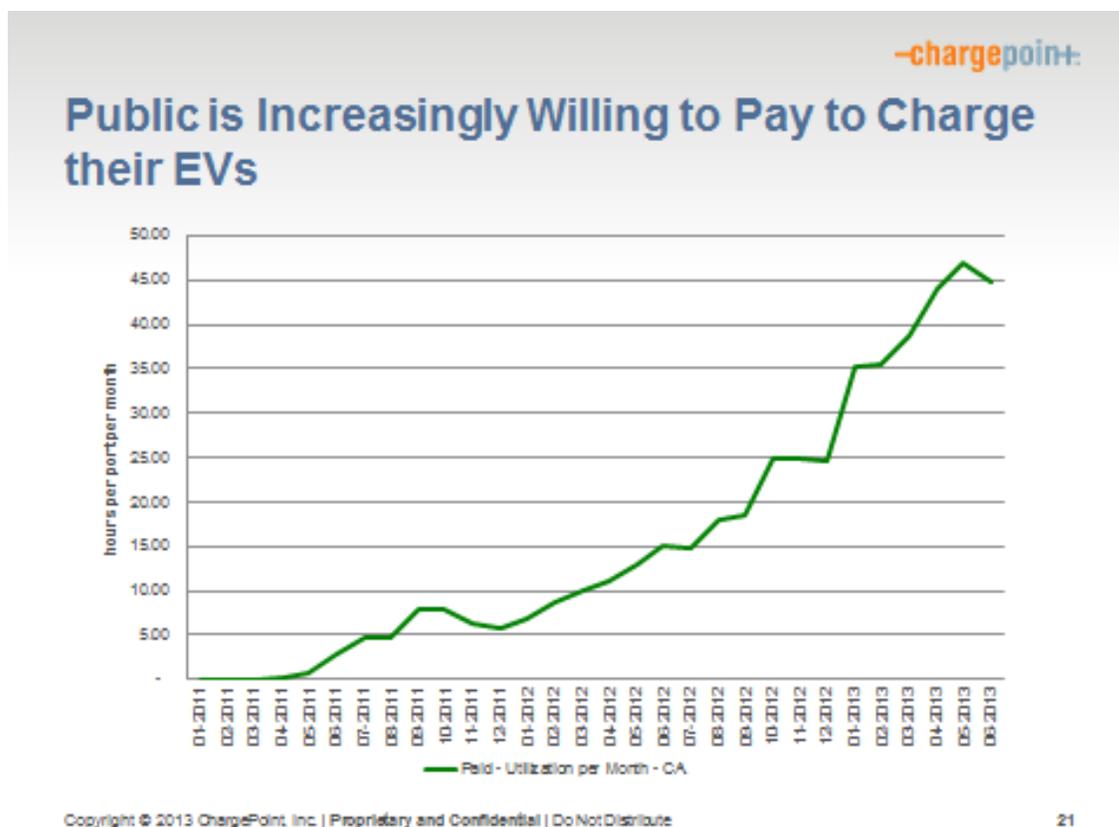
  

| <b>Revenues</b>      | <b>Per Charging Port Basis</b> | <b>Notes</b> |
|----------------------|--------------------------------|--------------|
| Charging Session Fee | \$2,190                        | \$1.50/hour  |
| <b>Total</b>         | <b>\$2,190</b>                 |              |



## Fee Structure Recommendations for EV Charging

**Charger Utilization Trends:** Current trends in charger utilization support the increasingly self-supporting nature of public charging. On a statewide basis, ChargePoint has tracked steadily increasing utilization rates which have seen charger utilization growth at least keeping pace with rapid growth in the EV population. In the chart below, utilization has steadily increased from 5 hours a month at the beginning of 2011, when just a few EV models were on the roads, to nearly fifty hours per month toward the end of 2013, when more than a dozen EV models (and a cumulative 100,000 plus EVs) have been deployed. As these trends continue into 2014-15 and beyond, the great majority of site hosts will find that “charging for charging” will fully cover their operational and energy costs, and help fund the further expansion of their local charging networks.



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**Lessons Learned:** Many of the public site hosts in the Bay Area that installed EV chargers in the 2010-2012 period opted to provide free charging during the first year, and in some cases provided free parking as well. While this may have been a helpful perk to encourage the adoption of EVs, the limitations of the free approach have become evident as EVs have become more ubiquitous. By adopting fee-based EV charging we are attempting to address the following issues:

1. **Charge at free station instead of home:** Charging stations may become over-utilized if drivers choose to charge at free public stations instead of charging at home. This can make the station unavailable to those who genuinely need charging.

2. **Convenience parking:** EV drivers who do not actually need additional charging sometimes park at a charger-equipped parking spot because it is the most conveniently available parking spot thus making it unavailable to other EV drivers in need of charging.
3. **Charging station hogging:** EV drivers leave their car parked and connected in a charger-equipped parking spot after their EV is fully charged making the charger unavailable to others.
4. **Operation and Maintenance Cost Recovery:** Site hosts are finding that operating and maintaining EV charging stations can be costly. These costs can be offset, at least partially, by a well-designed charging fee policy.
5. **Peak usage:** Site hosts have encountered the problem of very high demand for charging stations during certain periods of the day and week while at other times the stations go unused. By charging fees during peak times and lowering the fees during off-peak times driver behavior can be somewhat controlled.

The Bay Area Charge Ahead Project (BayCAP) recommended pricing plan is simple and has several core elements:

1. **Fee-Based Charging:** Site hosts are encouraged to set usage fees for use of the charger. This may or may not include separate charges for parking per the jurisdiction's usual parking policies. Fees may be calculated based on duration of stay, energy consumed (kWh), or a combination of the two. Fee-based charging should be calculated to at least pay for the energy consumed. It also may be beneficial to consider variable pricing based on time-of-day in areas where the jurisdiction is trying to encourage charging during off-peak periods for energy consumption and/or EV parking.

There are pros and cons for Time-based fees versus Energy Consumption-based fees.

#### **Hourly Charging Fees**

##### **Pros:**

- By charging a standard hourly fee the EV driver can easily calculate the amount of money that will be spent for a charging session.
- Fees continue to accumulate after the EV is fully charged which encourages drivers to move their EV thus making the charging station available to other EVs.

##### **Cons:**

- The hourly fee does not relate directly to energy consumed because different vehicles consume energy at different rates while charging. Consumption of energy varies from 1kW to 6.6kW. Drivers with low charging rate vehicles may feel the fees are too high and/or unfair.

#### **Energy Based Fees**

##### **Pros:**

- By charging a fee based on energy consumption the EV driver pays only for the electricity consumed during the charging session.
- This has the benefit of fees relating directly to energy costs which is more fair for drivers of low charging rate vehicles and ensures that drivers of high charging rate vehicles pay their fair share.

##### **Cons:**

- Once the EV is fully charged it can stay connected with no fees being accrued.
- The EV driver cannot easily predict the cost for charging since it is difficult to know how much energy the EV requires.

2. **Graduated Pricing Based on Duration of Stay:** Site hosts are encouraged to raise the fee for occupying the EVSE-equipped space by a sufficient increment to encourage turnover of the space and thus greater availability and utilization (in charging mode) for EV drivers. It is recommended that this approach be implemented after two to four hours of charging at the lower cost rate – particularly in cases where utilization rates are observed to be very high (70% or more) and available alternative charging facilities are limited. Many site hosts have chosen to substantially increase rates after the initial 2-4 hour period up to as much as \$5-\$20 per hour. It should be noted that this approach could also support free charging during the initial 2-4 hour period if the jurisdiction feels that it wants to encourage EV adoption but still maximize availability of charging stations.
  
3. **Time of Use Pricing:** Site hosts may also consider a lower evening or weekend rate for EVs (similar to most existing parking policies) to encourage responsible off-peak use. (In particular, lots proximate to multi-unit residential buildings could provide a lower-cost overnight rate with a higher daytime rate that incentivizes overnight EVSE users to make way for daytime visitors and commuters.) In addition to the lower evening or weekend rate it is also possible to remove Graduated Pricing policies during off-peak hours which would allow overnight charging.
  
4. **Initial Connection Fee:** One of the use patterns that have been observed in the early days of EV charging is that EV drivers who do not actually need to charge their vehicles will use an EV charging space because it is conveniently located and/or more available than other parking spots. One way to discourage this behavior is to charge an initial connection fee in addition to the Usage fees. A typical connection fee would be \$1.00 to \$2.00.
  
5. **EVSE Revenue and Cost Monitoring:** Pricing strategies should be reviewed on a periodic basis to ensure that expenses for sustaining charger operations are covered to the maximum extent feasible and appropriate. In most cases in the Bay Area, fees for charger operations set in the \$1 - \$1.50 range should be adequate for a well sited charger to cover energy costs, transaction fees, the ChargePoint network services fee, and (by Year 3) the *BayCAP – ABM Maintenance Plan*. In very rare cases where the charger is not yet being well-utilized, there may be a modest operating subsidy required.
  
6. **Signage and Enforcement:** As a complement to fee structures all charging station parking spots should have signs that reserve the parking spots for EVs that are plugged in and charging<sup>1</sup>. Signs should also show time limits (if any) and other relevant information. Active enforcement by local police is also encouraged. Note that there are California Vehicle Codes in place (CVC 22511.1) and local governments can establish their own codes in addition.

## Recommended Guidelines

The BACC recognizes that not all parking properties have the same needs. Therefore there is no “one price fits all” or even a “one-policy fits all”. Instead we are proposing some guidelines to help local authorities set fee policies. Following the Recommendations section there is a snapshot of current pricing policies in the Bay Area.

1. BACC recommends charging a fee for EV charging at public parking properties.
  - a. Time-based fees are preferable over energy use-based fees (\$1-\$2/hour with 15 minute increments after the first hour).
  - b. Energy use-based fees are acceptable with Access Fees (see below). \$0.25-\$0.50 per kWh + Access Fee (see below).
2. BACC recommends Access Fees sometimes called “Connection Fees”
  - a. Recommended Access fees are \$1-\$2
  - b. Not necessary if a minimum 1-hour is established for time-based charging
3. BACC recommends the implementation of Escalation Fees when charging is complete for locations where higher turnover is desirable.
  - a. With time-based charging the Escalation Fee should be about 5 times larger than the normal hourly fee (example: \$1/hour for charging escalates to \$5/hour after vehicle is fully charged).
  - b. With energy-use based charging the Escalation Fee will switch from Energy-use base to Time-base at \$5-\$10/hour)
4. BACC recommends special “Off-Peak” fees for properties that want to encourage parking during non-business hours. This will vary by time and type of location. Off-peak fees are particularly useful to encourage MUD residents to park and charge overnight.
  - a. Lower time-based fees (possible flat fee structure)
  - b. Lower energy-usage fees, especially during Off-Peak energy periods
  - c. Exempt from Escalation Fees
5. Signage and Enforcement is recommended at all EV charging stations
  - a. Parking is reserved for Electric Vehicles that are actively plugged in and charging
  - b. Time limits of 2-4 hours (off-peak excepted)
  - c. California Vehicle Code 22511.1 and/or local codes
  - d. Consult the PEV Collaborative “Accessibility and Signage” guide for signage guidance<sup>1</sup>

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<sup>1</sup> <http://www.pevcollaborative.org/Policy-makers>

**Survey of Existing EV Pricing Policies in the Bay Area**  
[sample – not complete]

| Name                      | City            | Access Fee | Hourly Fee | Power per kWh Fee | Escalation Fee | Off-peak | Notes                  |
|---------------------------|-----------------|------------|------------|-------------------|----------------|----------|------------------------|
| San Jose                  | San Jose        | \$ 1.25    |            | \$ 0.20           |                |          |                        |
| Santa Clara Univ          | Santa Clara     |            | \$ 2.00    |                   | \$ 3.00        |          | after 4 hours          |
| Santana Row               | San Jose        |            |            | \$ 0.49           |                |          |                        |
| HGST-GO                   | San Jose        |            | \$ 0.50    |                   |                |          |                        |
| Town of Los Gatos         | Los Gatos       | \$ 3.00    |            |                   |                |          | for 24 hours           |
| Los Gatos Inn             | Los Gatos       | \$ 4.00    |            |                   |                |          |                        |
| Saratoga                  | Saratoga        |            | \$ 1.00    |                   |                |          |                        |
| Cupertino City Hall       | Cupertino       |            | \$ 1.50    |                   |                |          |                        |
| Lynbrook HS               | San Jose        |            | \$ 1.50    |                   | \$ 5.00        |          | after 4 hours          |
| Yuba Dr                   | Mountain View   |            |            |                   |                |          |                        |
| Strata                    | Mountain View   |            | \$ 1.15    |                   |                |          |                        |
| Los Altos Plaza           | Los Altos       |            |            | \$ 0.32           |                |          |                        |
| Los Altos Hills City Hall | Los Altos Hills |            |            | \$ 0.25           |                |          |                        |
| Hewlett Packard           | Palo Alto       |            |            |                   | \$ 10.00       |          | per hour after 4 hours |
| Molly Stone Market        | Palo Altos      |            |            |                   | \$ 5.00        |          | per hour after 1 hour  |
| Palo Alto USC             | Palo Alto       |            |            | \$ 0.17           |                |          |                        |
| Stanford Shopping Center  | Palo Alto       |            |            | \$ 0.49           |                |          |                        |
| Stanford PS-5             | Stanford        |            | \$ 2.00    |                   |                | \$ 1.00  | 4pm-6am                |
| Menlo Park                | Menlo Park      |            | \$ 1.50    |                   |                |          |                        |