

# EV CHARGING COST STRUCTURE THE KEY TO INFRASTRUCTURE GROWTH

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# 36 DC Fast Chargers in Florida at 50kW



Retail  
Engagement

Dual Standard  
DC Fast Charging

Well-Lit

Highway  
Access

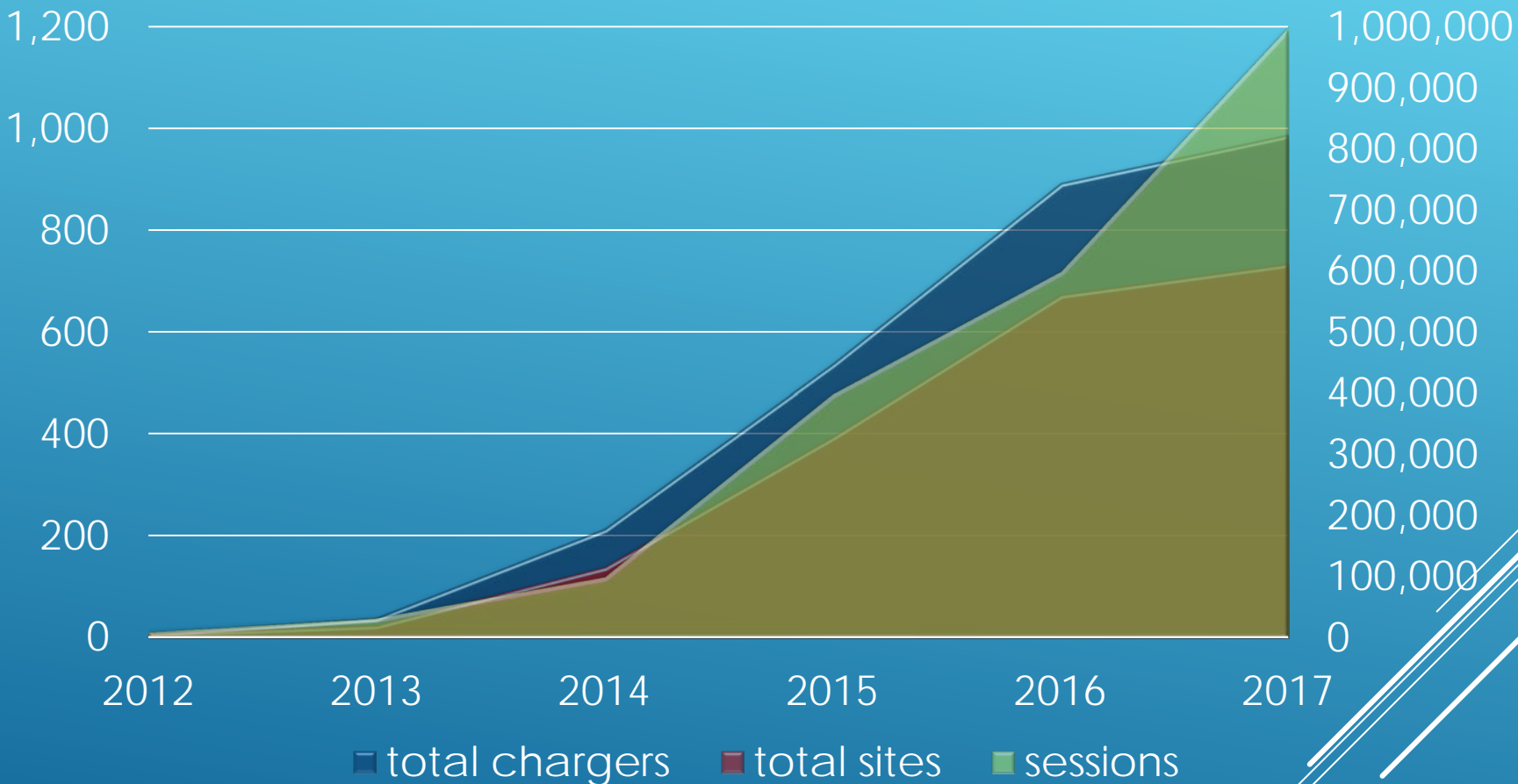
Level 2  
Charger

ADA  
Access

Dedicated  
EV Parking

# NETWORK GROWTH

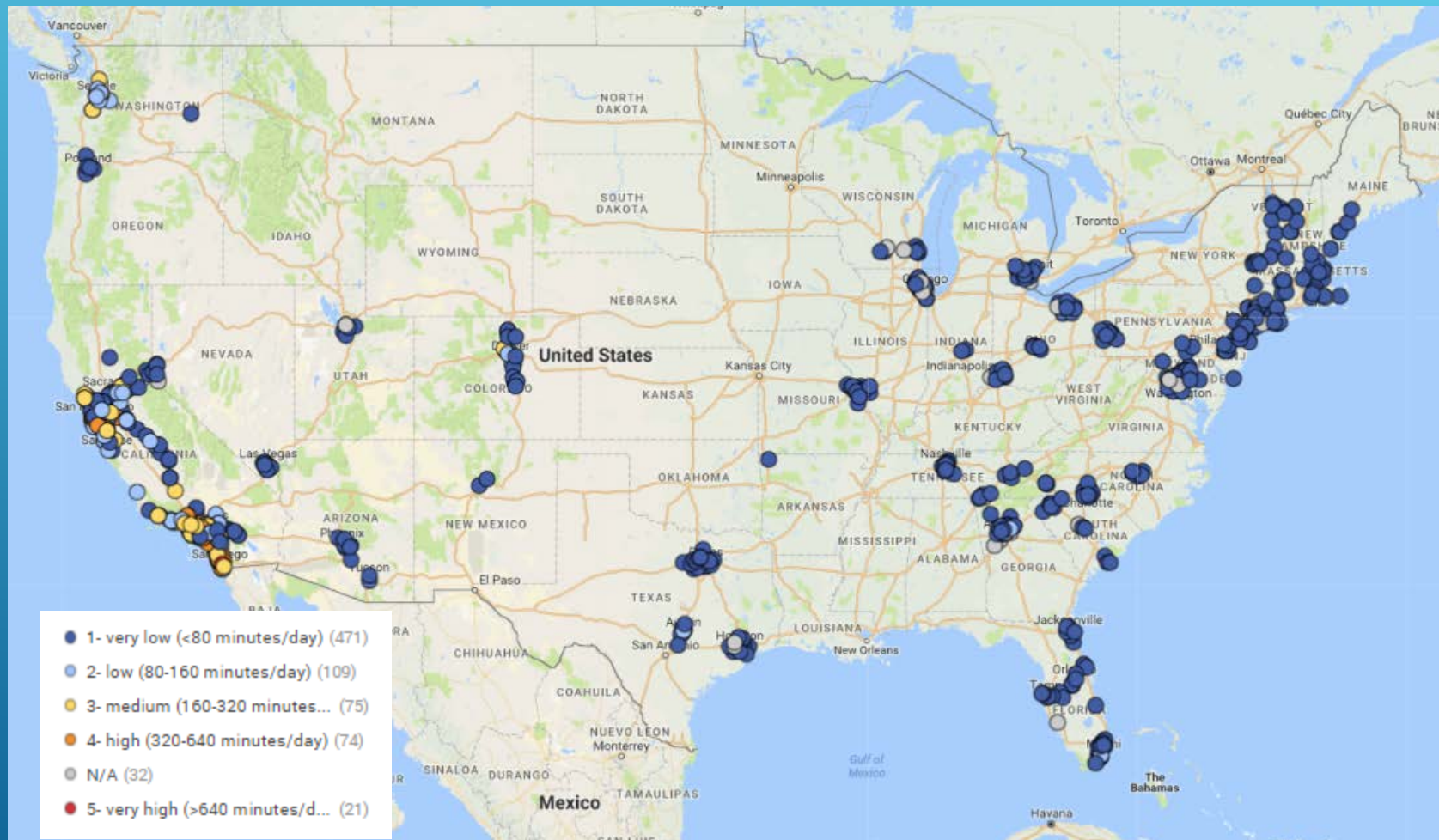
## Fast Charging Locations and Sessions



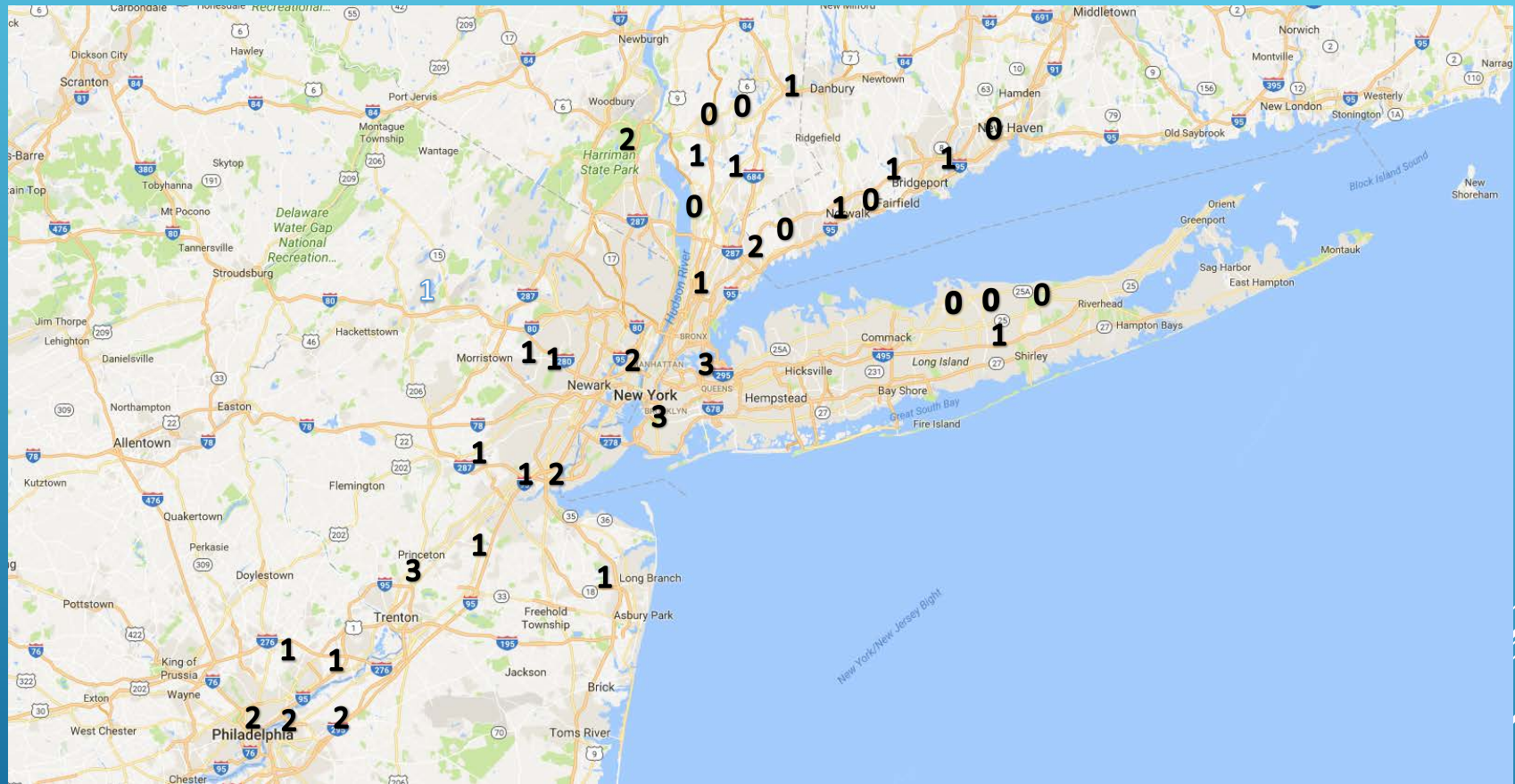
- Average of 10 sessions per site per day at 244 sites statewide
- As many as 70 sessions per site per day (Lucky Fremont, 18 sessions/charger)



# NETWORK UTILIZATION



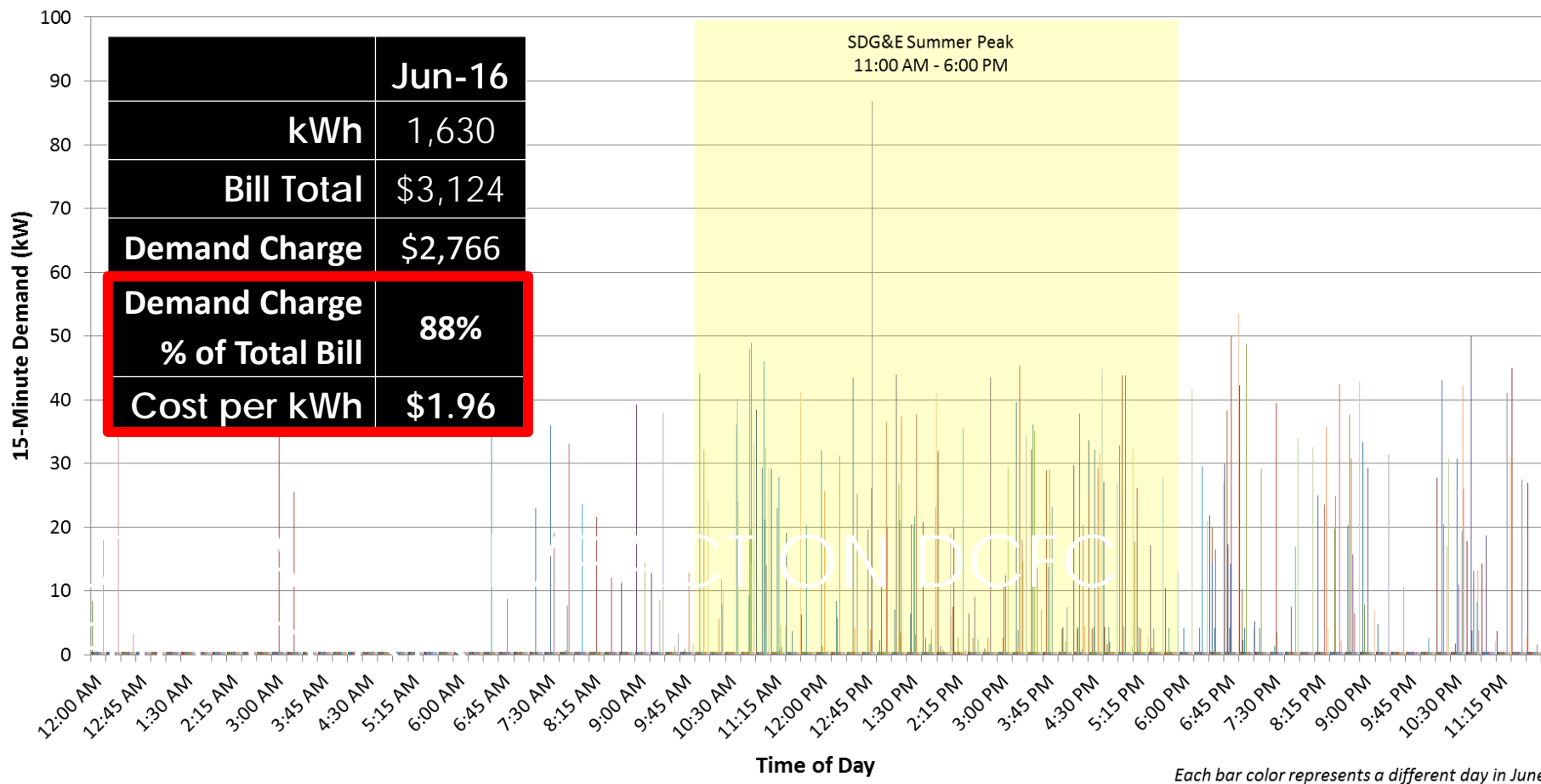
# REGIONAL UTILIZATION – NEW YORK



*Average number of charging sessions / day in July 2017*

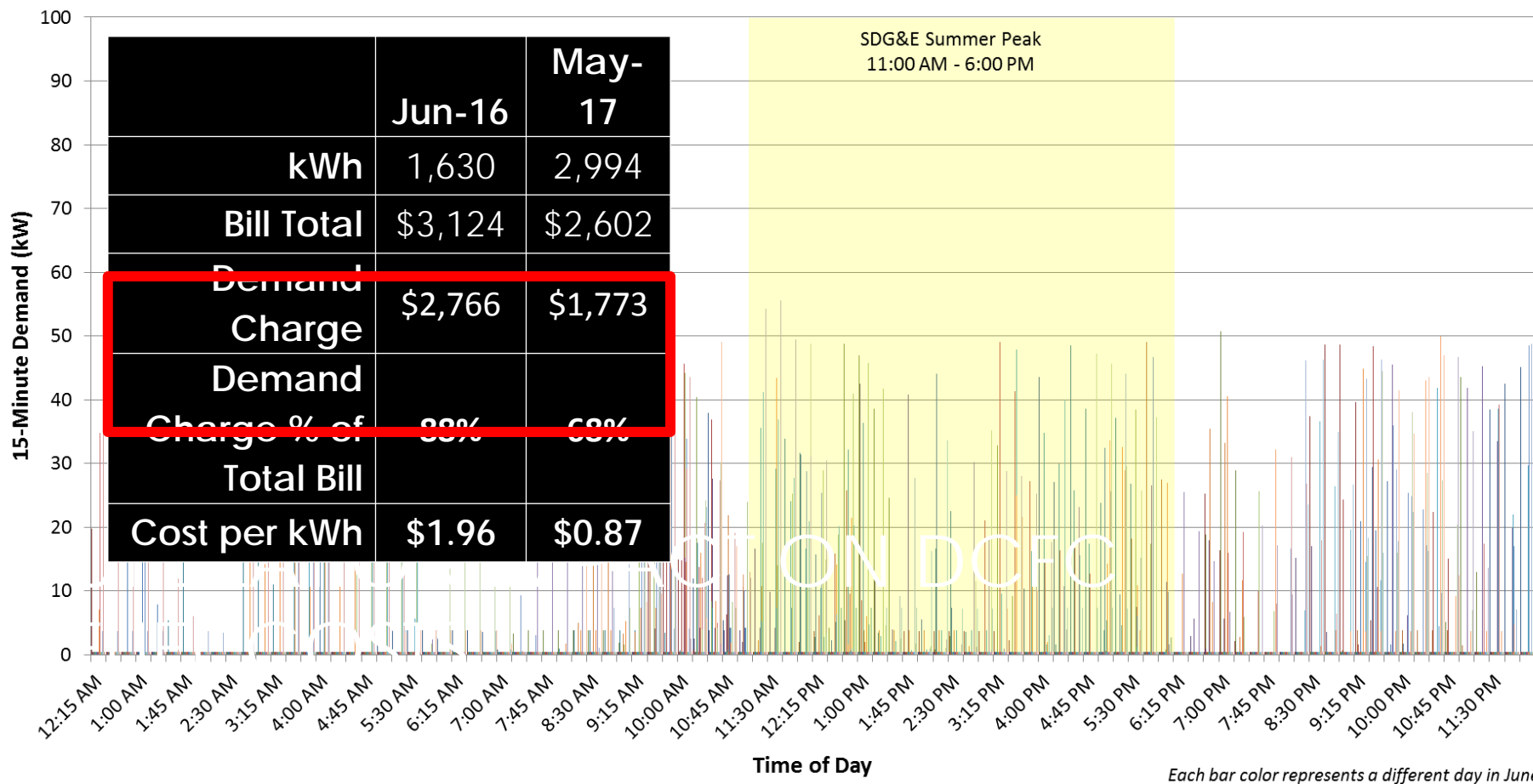
# DEMAND CHARGES

**Demand of SDG&E Freedom Station #1—June 2016**  
**Peak Demand = 86.7 kW**



# DEMAND CHARGES

**Demand of SDG&E Freedom Station #1—May 2017**  
**Peak Demand = 55.6 kW**

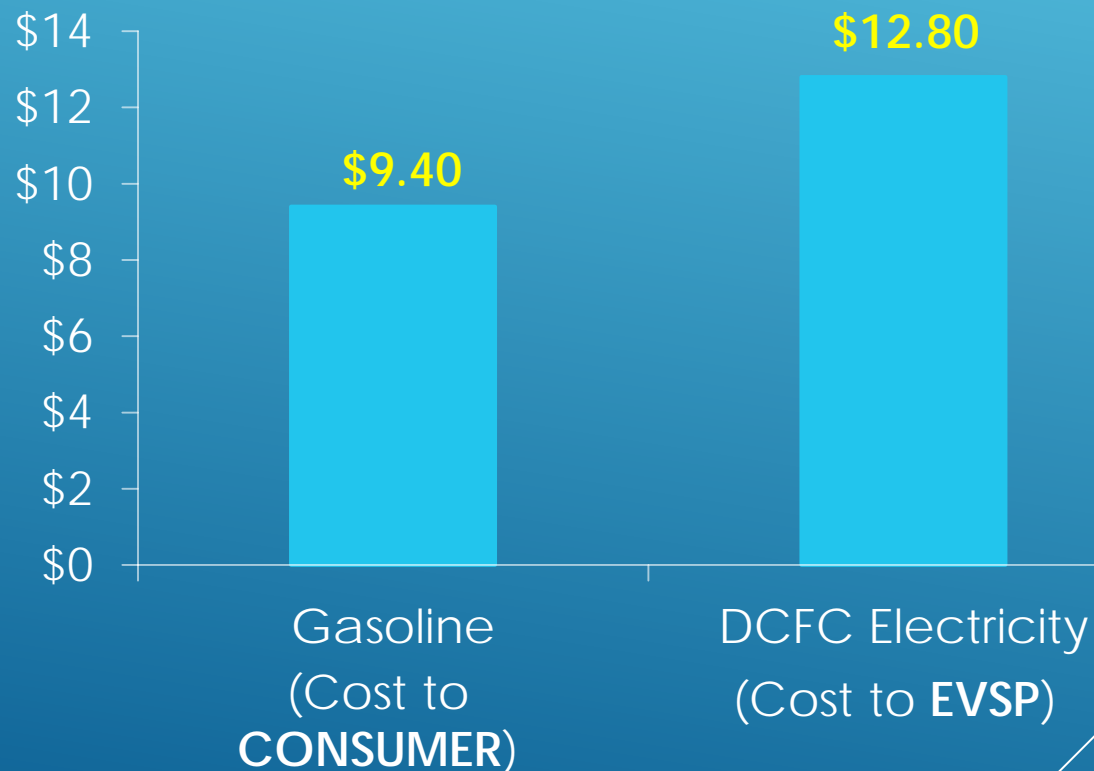




# FUEL COST COMPARISON

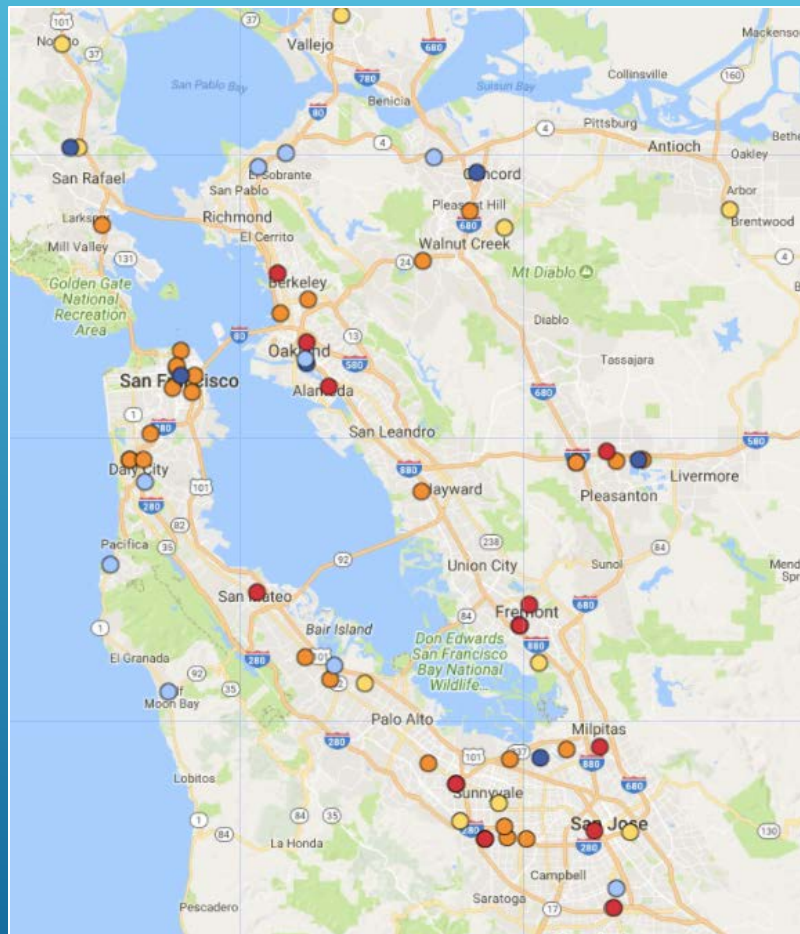
*EVgo's 2016 average DCFC electricity costs were 35% higher than average gasoline costs to consumers (in CA), for equivalent VMT.*

## Gasoline and DCFC Electricity Fueling Cost Comparison, per 100 VMT





# SAN FRANCISCO BAY AREA EXAMPLE



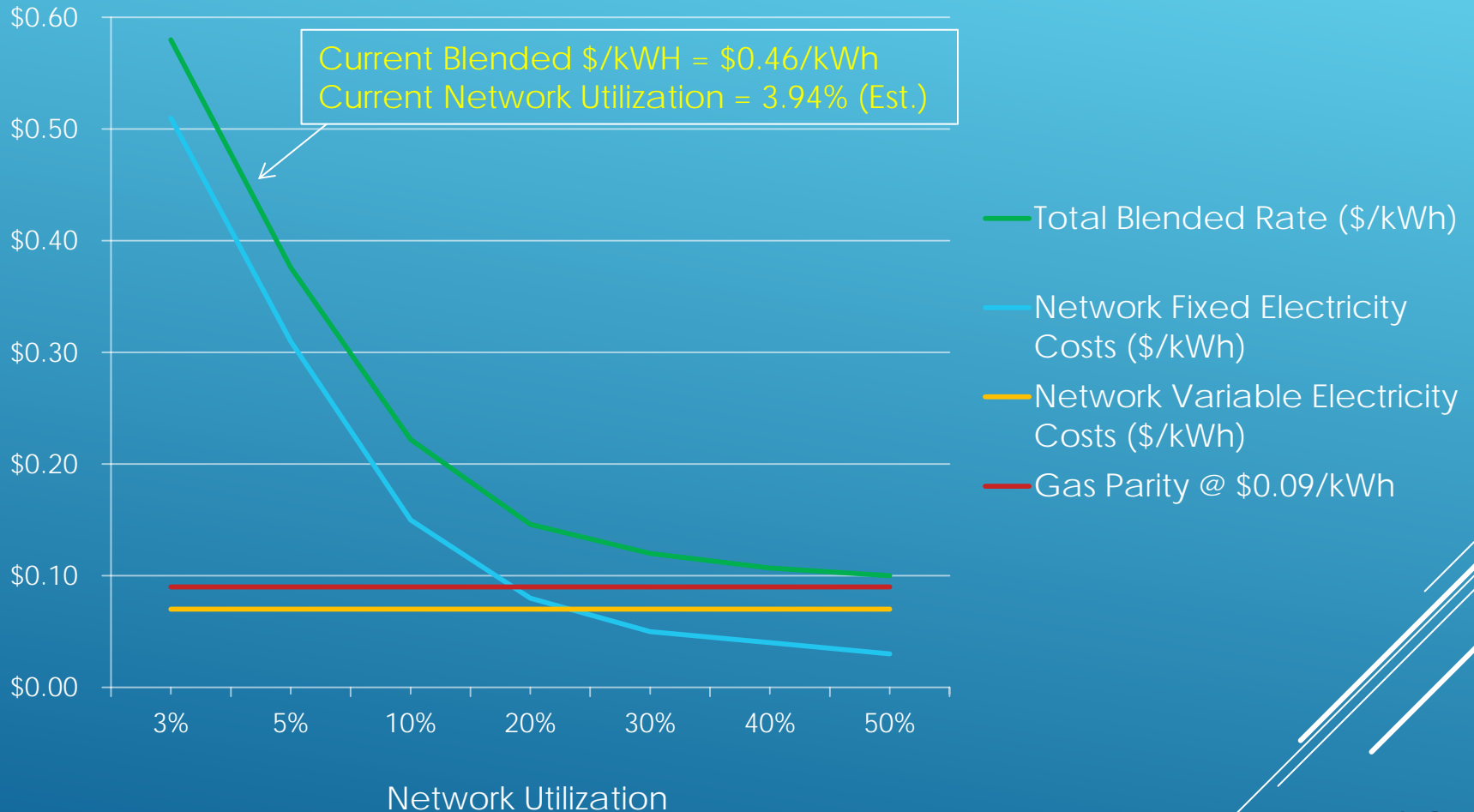
- Providing a network inherently means that some sites will be high utilization and some will be low
- Even the low utilization sites are important

## Legend: Avg. Flow Min/Site/Day

- 1- very low (<80 minutes/day) (471)
- 2- low (80-160 minutes/day) (109)
- 3- medium (160-320 minutes... (75)
- 4- high (320-640 minutes/day) (74)
- N/A (32)
- 5- very high (>640 minutes/d... (21)

# ELECTRICITY COSTS AND UTILIZATION

FL Network Blended  
Electricity Costs (\$/kWh)



Based on EPA estimates of 1 gallon of gas = 33.7 kWh and EIA estimates of \$3/gallon of gas in CA (\$ 2.50 nationwide)  
 Gas is \$.07/kWh nationwide, \$.09 in CA  
<https://www.fueleconomy.gov/feg/Find.do?action=sbs&id=38428&id=38187>  
<https://www.eia.gov/petroleum/gasdiesel/>

# Florida Power and Light – July 2017

| Site # | # of Chargers | Peak Demand (kW) | Usage (kWh) | Total Bill | \$/kWh  | Demand Charge | Demand Charge as % of Bill |
|--------|---------------|------------------|-------------|------------|---------|---------------|----------------------------|
| 4378   | 2             | 59               | 2,146       | \$ 975.98  | \$ 0.45 | \$625.40      | 64%                        |
| 1992   | 1             | 51               | 944         | \$ 781.68  | \$ 0.83 | \$540.60      | 69%                        |
| 2298   | 1             | 39               | 1,108       | \$ 636.70  | \$ 0.57 | \$413.40      | 65%                        |
| 4454   | 1             | 49               | 302         | \$ 718.50  | \$ 2.38 | \$519.40      | 72%                        |
| 4456   | 1             | 49               | 694         | \$ 738.17  | \$ 1.06 | \$519.40      | 70%                        |
| 5381   | 1             | 47               | 587         | \$ 704.08  | \$ 1.20 | \$498.20      | 71%                        |
| 622    | 1             | 38               | 472         | \$ 577.67  | \$ 1.22 | \$402.80      | 70%                        |
| 642    | 1             | 54               | 1,025       | \$ 813.66  | \$ 0.79 | \$572.40      | 70%                        |



# Other FL Utilities – July 2017

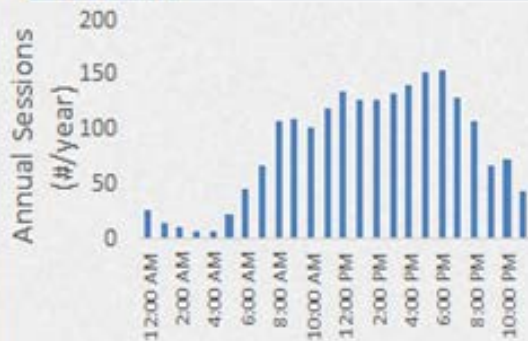
|                              | Site # | # of Chargers | Peak Demand (kW) | Usage (kWh) | Total Bill | \$/kWh | Demand Charge | Demand Charge as % of Bill |
|------------------------------|--------|---------------|------------------|-------------|------------|--------|---------------|----------------------------|
| Duke Energy                  | 3535   | 1             | N/A*             | 278         | \$49.88    | \$0.18 | \$0           | 0%                         |
|                              | 625    | 1             | 47               | 1,048       | \$149.31   | \$0.14 | \$0           | 0%                         |
|                              | 623    | 1             | 42               | 808         | \$118.31   | \$0.15 | \$0           | 0%                         |
| New Smyrna Beach             | 1961   | 1             | N/A*             | 640         | \$507.56   | \$0.79 | \$337.50**    | 66%                        |
| Orlando Utilities Commission | 624    | 1             | 48.82            | 434         | \$539.20   | \$1.24 | \$390.55      | 72%                        |

\*Site does not have demand meter.

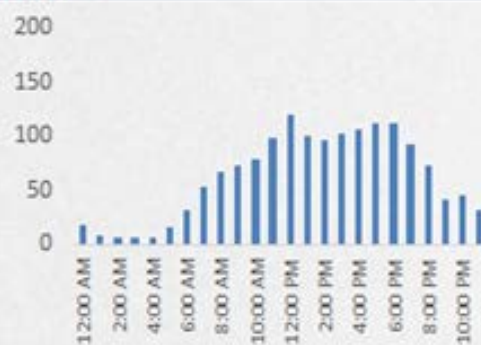
\*\* "Minimum Demand Charge" on bill.

# Load Profiles

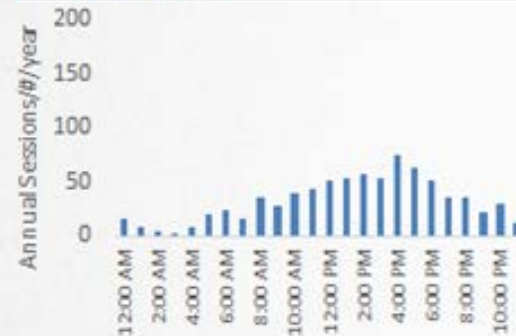
## Grocery



## Mall



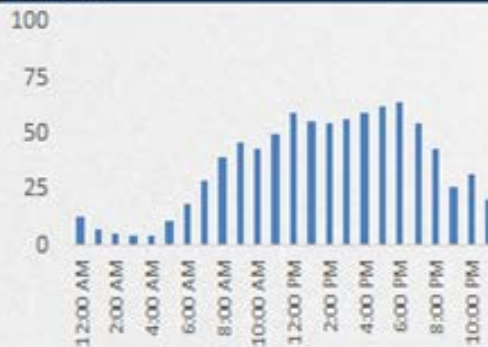
## Gas Station



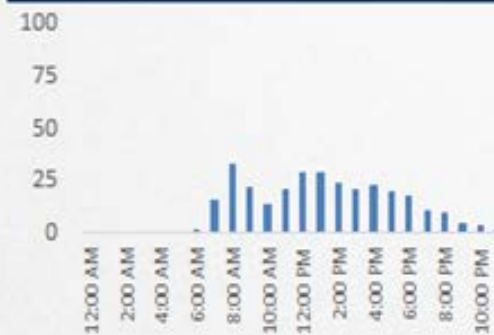
## Hotel



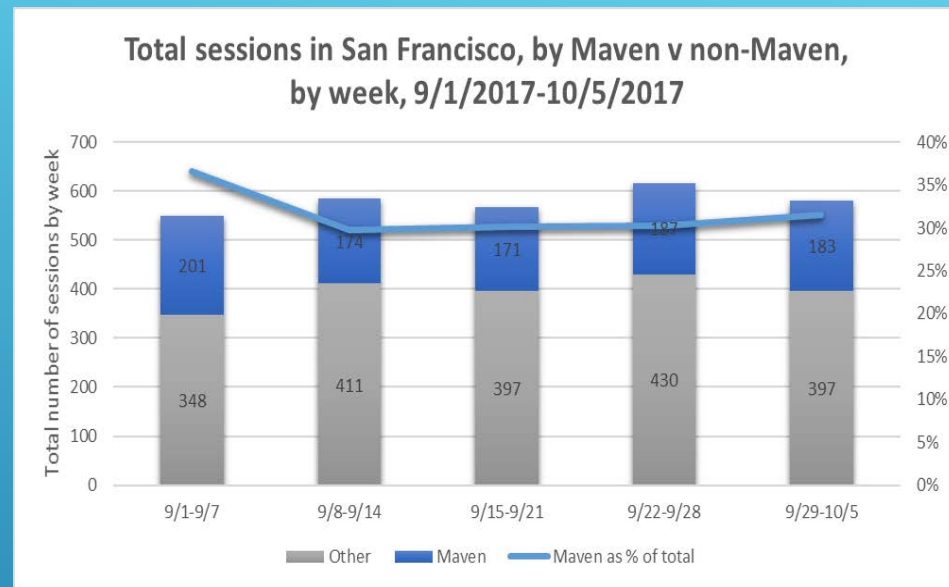
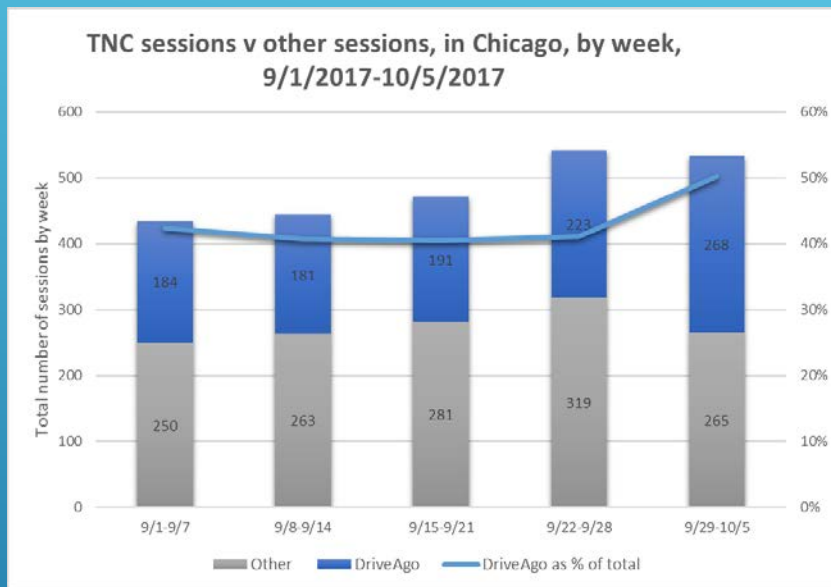
## Retail



## Gov't / School



# EMERGING USE CASE IMPACT ON UTILIZATION

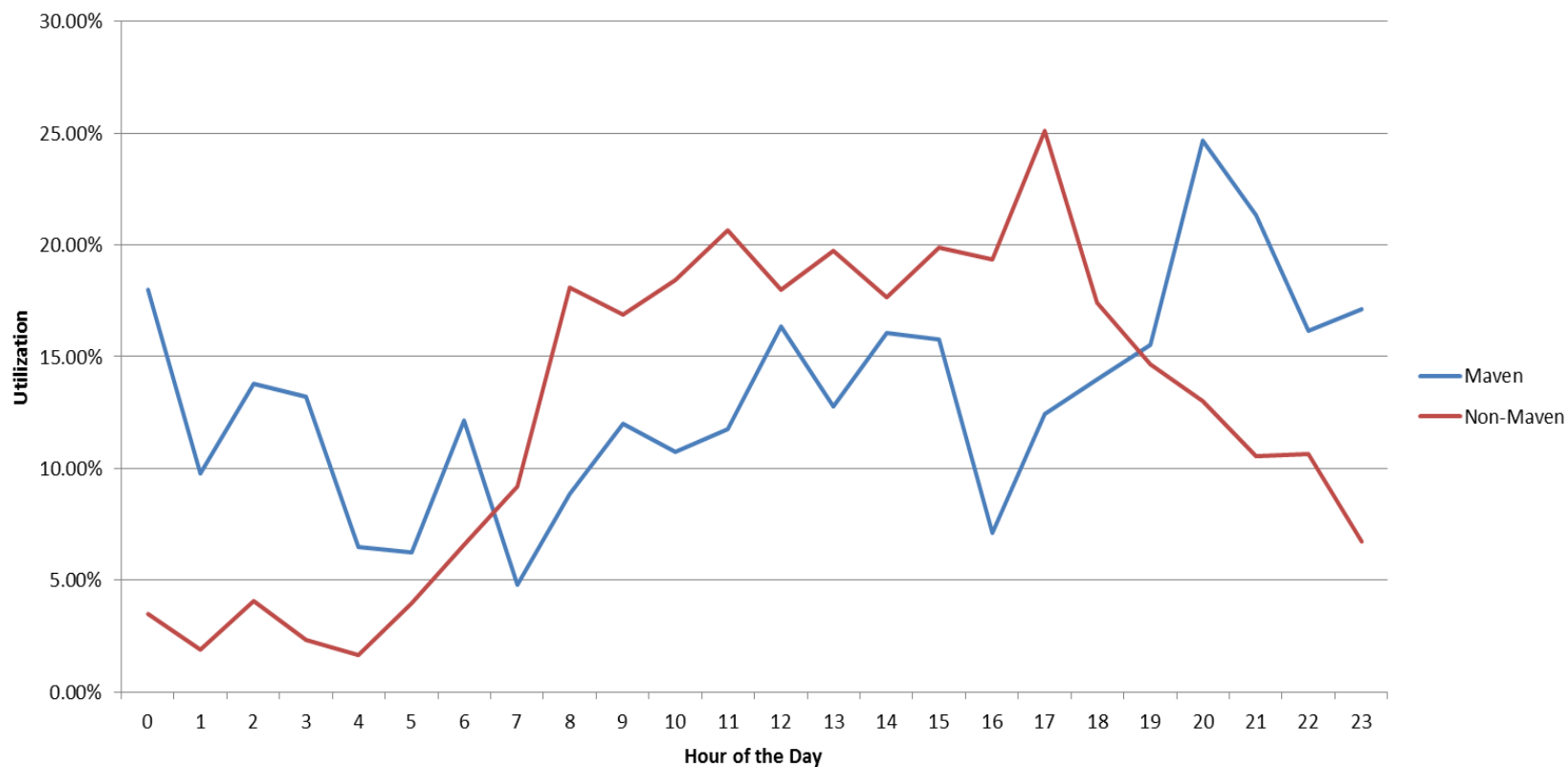


- TNC drivers have logged an as much as 50% of total sessions in the Chicago market
- TNC sessions provide a steady increase in utilization while exposing more people to EVs
- Some sites (Las Americas) in San Diego are experiencing a 100% increase in utilization, with 50% of sessions from TNC drivers

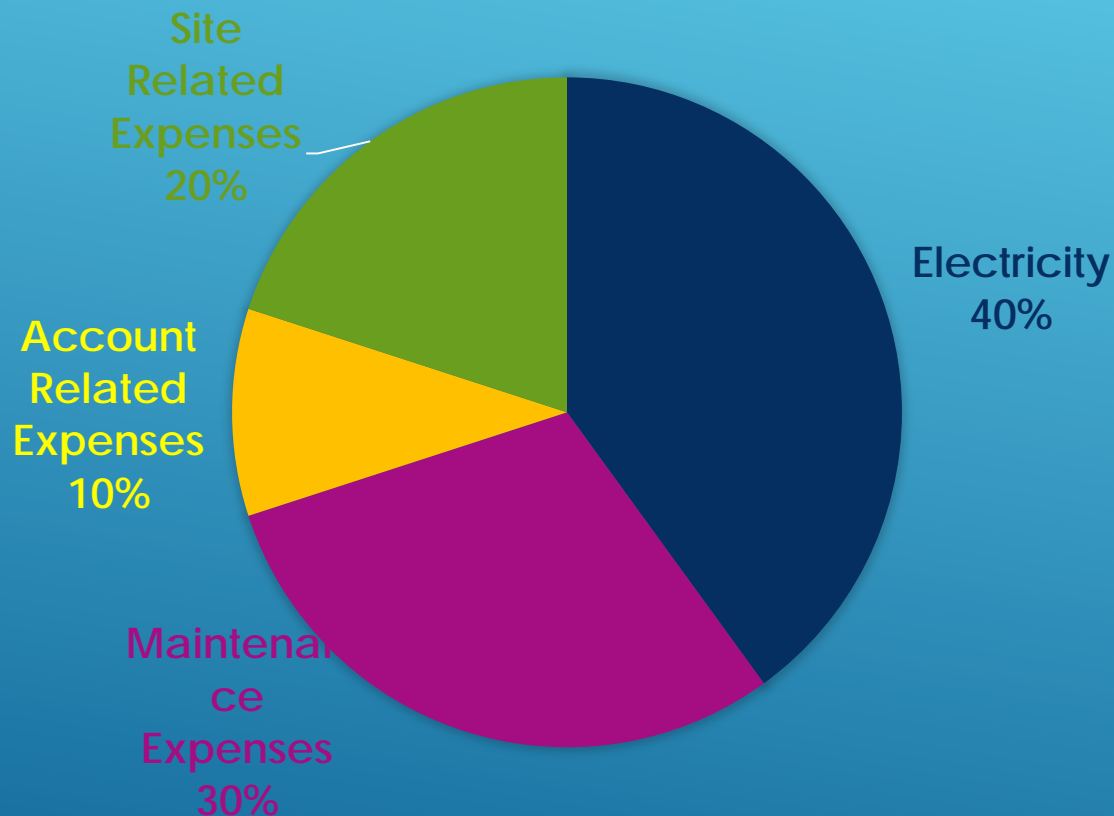


# Load Balancing Utilization

## Average Hourly Utilization of the Top Maven Stations in SD

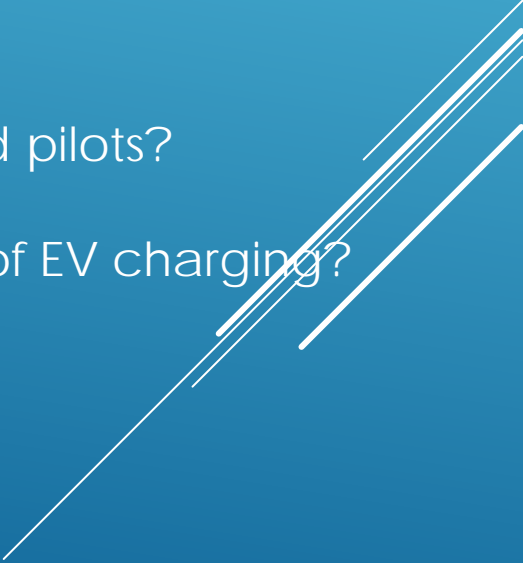


# DC Fast Charging Operational Costs Breakdown



*Electricity is only 40% of operational costs*

# Network Utilization & Operating Cost

- Low utilization and peaky demand are persistent traits of EV charging networks, though variation is high and new use cases may produce some sites with more consistent demand.
  - Chicken or the egg?
  - Who are the right stakeholders to be involved in providing sustainable EV infrastructure.
  - What is the growth model for infrastructure?
  - What should be learned from early investments and pilots?
  - How can we ensure equity in distribution and cost of EV charging?
- 



# Rate Options for a Diverse Network

- Creating options for success of both partners is key to financially sustainable growth and attracting investment
- For example:

| Utilization | Energy Charge Discount (kWh) | Demand Charge Discount (kW) |
|-------------|------------------------------|-----------------------------|
| <10%        | 10%                          | 90%                         |
| 10%         | 20%                          | 80%                         |
| 20%         | 40%                          | 60%                         |
| 30%         | 60%                          | 40%                         |
| 40%         | 80%                          | 20%                         |
| 50%+        | 90%                          | 10%                         |

# New Rate Proposals – Real World

- New proposed rates are recognizing this issue by allowing EV stations to avoid demand charges for the first 5 years of operation.
- Proposed SCE EV rate

| Year | Energy Charge (kWh)   |                       |            | Demand Charge (kW)    |                       |            |
|------|-----------------------|-----------------------|------------|-----------------------|-----------------------|------------|
|      | Distribution Capacity | Transmission Capacity | Generation | Distribution Capacity | Transmission Capacity | Generation |
| 1-5  | 100%                  | 100%                  | 100%       | 0%                    | 0%                    | 0%         |
| 6    | 90%                   | 83%                   | 100%       | 10%                   | 17%                   | 0%         |
| 7    | 80%                   | 66%                   | 100%       | 20%                   | 34%                   | 0%         |
| 8    | 70%                   | 49%                   | 100%       | 30%                   | 51%                   | 0%         |
| 9    | 60%                   | 32%                   | 100%       | 40                    | 68%                   | 0%         |
| 10   | 50%                   | 15%                   | 100%       | 50%                   | 85%                   | 0%         |
| 11+  | 40%                   | 0%                    | 100%       | 60%                   | 100%                  | 0%         |