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MHD fleets require funding support as more barriers exist in commercial EV deployment than LD vehicles

Additional submitted attachment is included below.

Docket No: A.18-01-012

Date: Aug. 20, 2018
Witness: Lisa McGhee

BEFORE THE CALIFORNIA ENEGERY COMMISSIONER DEPARTMENT OF TRANSPORTATION ON THE VEHICLE MERIT REVIEW FROM 8-6-18

COMMENTS OF SAN DIEGO AIRPORT PARKING COMPANY

TRANSPORTATION ELECTRIFICATION FOR MEDIUM AND HEAVY-DUTY ELECTRIC VEHICLES

BY: LISA MCGHEE

COMMENTS of SAN DIEGO AIRPORT PARKING CO.

Introduction and Background

Please state your name and business address.

My name is Lisa McGhee. My business address is 2771 Kurtz St., San Diego, CA. 92110

By whom are you employed and in what capacity?

I am the Operations Manager and Regulatory Manager of Transportation and Environmental affairs for San Diego Airport Parking Company. In my current role, I advise and make recommended decisions for the company on the fleet procurement as well as participate in regulatory agencies associated with transportation in order to oversee the decisions and issues that affect transportation operations. My team of employees include the Commercial Drivers who are the shuttle drivers Commercial Motor carriers have a high duty of care for safety while operating the bus and thereby are responsible for safety of the passengers and for the safe performance and operation of the bus and must be fit to do the job. I am responsible for Motor carrier safety in our operation. I handle the end to end use with new projects that are being developed for the company in order to meet existing regulations, updates and new changing future regulations ---all with the goal of staying current, legal, safe and efficient with a reliable useful life period that the procured assets and capital equipment can maintain without risk over-time, in other words, the equipment we operate can do the job and is durable for the duty cycle that we operate 24/7 and 365 days per year. Our vehicles

are the company's assets and the transportation department makes up 40% of all expenses in the operation with the entire service being at no cost but yet a high duty for care and safety. As such, I am responsible for procurement decisions that I recommend that are based on an analysis of best cost and best benefit that I believe will support the operation for the useful life that is budgeted and forecasted. My main focus since 2010 has been to establish a fleet operation to support the climate goals and in 2015 SDAP introduced Electrification Transportation into its fleet which required procuring 3 Electric shuttle buses and installing 3 EV Level-2 commercial charging infrastructure supply equipment (EVSE), the EVSE output is at 14kW of power level. SDAP's experience on transportation began in 1991 and fueling had only been with conventional and low NOx fuels until SDAP procured Electric buses. SDAP had always been on a Small business commercial utility SDG&E price plan since 1991 and has never been subject to demand kW fees. In 2015, SDAP was subject to demand fees for its TE fleet; thereby SDAP participated in SDG&E's last rate case proceeding 15-04-012.

Please describe your background, experience and expertise.

I have been working in the fleet procurement process since 2010. I myself hold a commercial passenger driver license and originally got my class A commercial drivers doubles and triples license back in 2000. SDAP was required by a MOU between the AG office and its relationship with the SAN Airport to move into Low NOx vehicle fleet procurement. I've been deeply involved with the climate goals ever since that time. It was in 2015 when I made the recommendation for SDAP to procure 50% of its fleet to EV's and since that time, I've been involved in the evolution of standards and policies around EV's and infrastructure. Prior to joining SDAP, I've provided

consulting services for Expo Propane, an auto gas propane company. I was operations manager for a fitness facility for 8 years. I'm very familiar with making large capital equipment decisions to support the operations of a company and that will affect its future.

On whose behalf are making these comments and why?

I am making comments on behalf of San Diego Airport Parking Company and to support other small commercial MHD fleets that would face the same cost and challenges when displacing its fleet to TE.

What is the purpose of your interest to share comments?

The purpose of my interest is to discuss the TE MHD funding that is generated from SB350, the ARFVTP, the HVIP rebates and the AQUIP --- billions of $$ that have been supporting the technology since it began. I will discuss the reasons that SDAP in general supports TE. I will also identify areas in which there is a lack of sufficient policies, testing, standards and managed charging solutions to achieve best cost and best benefits. TE could be supported by non-grid charging or infrastructure solutions that do not need to be fully 100% wired grid charging. I will provide specific recommendations to facilitate and incorporate an example of a solution that could be enabled. I will briefly address "lessons learned" and the need for an EV commercial rate that mitigates the impact of demand charges on customers providing EV fast charging services and how fleets are negatively impacted by demand fees. The demand fees in California across the corridor from South to North can be over 100% more expensive in Southern California, such as in the SDG&E service territory. I will also identify SDAP's own Fleet Use Case which identifies limitations to mitigate demand fees and or to schedule charging or to shift charging when 100% on

the grid. There is a lack of advanced managed charging equipment and renewables charging infrastructure being integrated for commercial TE. The opportunities enable commercial fleets to reduce cost on ratepayers, reduce demand rates, shift kilowatt hour rates and create emergency response hubs that could support other local ratepayers --- all while reducing emissions and reducing installation cost. I will provide a specific Fleet Use Case for recommendation that incorporates the "lessons learned" from SDAP's own implementation of an EV Fleet program. I will address the need for an EV Commercial rate to support early adopters for both large and small customer classes in the ***MHD transportation*** sector. And I will share facts on how far we have progressed in the MHD sector according to procurement sales of MHD EV's in California after spending billions of tax payer's money. SDAP alone makes up 30% of the TE commercial MHD fleets in San Diego as San Diego has a total of 11 HVIP sales since 2009 and SDAP has 3 of these sales. (See https://www.californiahvip.org/tools-results/#mapping-tool)

Please describe SDAP's interest in TE and the merit review.

SDAP is an experienced MHD fleet. SDAP is an experienced MD TE fleet. SDAP has experienced benefits and negative cost associated with its procurement into TE. SDAP is concerned with maintaining reliable TE equipment for robust stakeholders in the MHD space. As a Medium Duty (MD) fleet provider of Shuttle Services for SAN Airport Operations in San Diego, we are open 24/7 since 1991 and we average 20,000 miles per month in our fleet averaging 650 vehicle miles traveled (VMT) per day. We want to ensure that these program enables all classes of commercial fleets and sizes of fleet operations that are best suited for electrification and that are currently facing a measure to adopt Zero Emission transportation. SDAP sees many benefits in the technology to and

is very concerned that the programs to date have not fairly included a diverse program that is the Medium Duty Class. Specifically, today, the program has zero Class 2B vehicles in inventory, it has two Class 3 vehicles (the second OEM was just listed one month ago); therefore, there is only one Class 3 vehicle with any sales today. I also am concerned with the lack of support toward small commercial business that makes up 90% of all transportation fleets. For example, in San Diego --- SDGE's small class commercial customers make up 87% of all commercial customers and in San Diego on average all industries are 95% small business operations. SDAP wants to see the programs and funding to support the small business and the light MD sector. The light MD sector is the most popular commercially registered vehicle; thereby this is great opportunity for scalability. Per ARB as of May 2018, the Class 2B/Class 3 population is in the table below. (See ARB Vehicle population Statistics, page 10, from the May 2018 Clean Truck Working Group: https://www.arb.ca.gov/msprog/actruck/mtg/180531presentation.pdf)

Industry	Respondent Vehicle Population			Statistics			
	2B to 3	4 to 7	8	Daily Mileage	Annual Mileage	Years in Fleet	Overnight return to base
California State Fleet	15,915	3,960	3,180	-	6,400	-	-
Gov't/Public	1,172	585	325	30	10,000	11	100%
Utility	656	784	214	50	10,000	12	67%
Construction	25	50	1,270	100	18,000	10	90%
Equipment Rental/Dismantler	0	118	85	115	28,500	10	100%
Retail	590	888	117	150	36,000	9	100%
Total Vehicles by Class	18,358	6,385	5,191				

Link to Survey https://www.arb.ca.gov/msprog/actruck/docs/acltsurvey18.docx 10

This technology is nimble and nascent; moreover, fleets deserve to have a seat at the table to share the fleet procurement objective requirements, the performance, reliability and useful life standards expected. Fleets are very savvy at vehicle procurement --- can you imagine driving your vehicle

for 4,000 miles per month or for 8 hours or more per day? Fleets are keen to knowing what they want, need, expect, will pay, residual value, total cost of ownership (TCO). We live and breathe this with each vehicle that is on the road daily for over 8 hours per day. How many of you know what it is like to drive and wait in traffic every single day for 8 hours more per day and what if you have a vehicle that a malfunction. What would happen to you if your car did not run? How would this affect your commuting? Now apply this to maintaining a reliable and successful operation to keep your customers happy and meet the demand required to maintain the relationship. Your programs require diversity and should include all classes of vehicles and all sizes of fleet operations as it currently lacks a target toward support small business, small fleets and the most popular MD vehicles.

Please describe reliable and managed charging for fleets:

The TE MHD space has NO standards for either an EVSE or it's connectors, and the same for the Vehicles, there currently is no testing standards as CARB and EPA only regulate the fuels and emissions from the tailpipe. The vehicle Reliability, performance and efficiency are currently not regulated and thereby the future winning standards are unknown, and this includes the efficiency of the vehicles on how many kilowatts per mile. The answer is the cost of a mile when displaced from fossil fuels. There is no standard on the SOC or the battery efficiency as such, the loss factor will cost the fleet more kWh when dispensing even though you cannot use these kWh in the vehicle. EV tariff are not well designed for commercial transportation and are very complex and can change daily. Rates need to be a benefit, make ready needs to be available on a property however, many

properties share a transformer and may not have the 3 phase, and when fleets with multiple vehicles charge, there needs to be 3 phase power and there should be a requirement for fleets to have equipment to support effective load management strategies and there should be a rate to provide rewards and incentives when shifting. As a supporter of SB 350's goal of promoting cost effective investments, SDAP understands the need for utility participation in programs aimed at expanding the Make Ready for the EVSE infrastructure throughout California and the Utilities seems well designed to meet that need. But it will be more important to effectively implement and introduce renewable charging infrastructure in order to ensure the success of integrating the most advanced EV equipment that is currently available and is quickly becoming a part of the standards for the future of MHD EV Charging. Specifically, this will be required for fleet success and is the simplest way to manage charging with these other more suitable options verses only via Time of Use (TOU).

What are the EV NEEDS?

The TE Fleet business model NEEDS to incorporate renewables and managed charging solutions with storage equipment in order to enable shifting of higher kilowatt hour rates and reduced CI and GHG time of use charging periods --- as this enables capturing the over generated renewable electricity that might otherwise be wasted / curtailed. This would allow promoting the integration of renewable power and ZEV related loads to be managed and to help make these vehicles truly Zero emission both upstream and downstream and to promote the expansion of managed charging for commercial fleet customers that will not be able to directly shift their time of use as the TE fleets coupled with the number of miles and available hours to charge will not support "scheduled" charging and cannot take advantage of a super off peak period. Smart integration with EV

infrastructure management control solutions that support reduced peak time on the grid – will limit demand fees at peak time and non-coincidental, reduces higher kWh use at peak time, prioritizing energy storage mixes in fleet TE deployment has many benefits that will reduce installation costs of trenching, wires and transformers. This execution is very possible when the number of vehicles adopted to TE fleets at the early stages and lessons learned from the first time adopters proves the adoption process is slow and low; thereby, all dispensing for the fleet at peak time can enable off grid charging and will result in no power load on the grid – thereby the fleet can dispense as fast as the equipment enables without the added upgrades or transformers, reduces loading from the grid, and curtailing and rate management promotes for best kWh pricing and encourages an attraction to beat diesel fuel prices. See below for which is the SDAP use case which is a small Fleet. The issues are immediate in this current Use Case due the lower power level charging is too slow for commercial use. The use is MD EV vehicles with power level capacity at 14 kilowatts, this 14 KW will be the output for each charging event; thereby this use case requires one EVSE for every single EV Bus and when 100% tied to the grid. See SDAP Exhibit for EV Miles and Cost of EV comparison.

1. **SDAP EV Fleet: Productivity / Behavior (non-managed charging)**

    a. **Driving Productivity = Vehicles Miles Traveled (Short Duty Cycle)**

        i. **Open 24/7**
        ii. **650 miles per day for fleet**
        iii. **10-hour driver shifts**
        iv. **125 vehicle miles traveled per shift by each driver**
        v. **EV range = 100 miles**
        vi. **2 drivers at 4am to 2pm = 125 miles**
        vii. **2 drivers at 2pm to Midnight = 125 miles**
        viii. **1 driver at 10pm to 8am = 125 miles**

b. Charging Behavior = power level 2 at 14 kW and 3 EVSE's on property

- **i. 4 hours to fill = 100 miles**
  1. **Done at OFF Peak Nightly**
- **ii. 2 hours of EV charging = 50 miles of range**
  1. **12 fills per shift at 10 mins each = 2 hours and 50 miles of range**
     a. **Done at Shift 1**
- **iii. 3 hours of EV charging = 75 miles of range**
  1. **12 fills per shift at 15 mins each = 3 hours and 75 miles of range**
     a. **Done at Shift 2 and at Graveyard**

c. Driver Behavior

- **i. Fill up 10 mins each time back at base**
- **ii. 12 fills per day**
- **iii. = 2 hours of charging**
- **iv. = 50 miles of range generated**
- **v. 2pm, Shift #1 ends**
  1. **25 miles of range remaining**
- **vi. Shift # 2 starts with 25 miles of range at 2pm**
  1. **12 fills x 15 minutes**
     i. **= 180 mins at 3 hours**
     ii. **= 75 miles of range replenished**
- **vii. Shift #2 ends at Midnight**
  1. **Driver #2 is empty at end of shift and he is short 25 miles of range.**

d. All day long this demonstrates that the business demand does not allot for "scheduled" charging or managed charging with Time of Use.

e. Charging Plan and Storage Capacity of 100-mile range in vehicle:
Use Case: 4 shuttles, 2 drivers per shift = 650 miles daily.

i. Midnight to 4am = Full Charge = 100 miles
    1. 3 buses charging at same time
        a. = 12 hours daily charging Midnight to 4am (= 300 miles)
ii. 4am to 2pm = 2 hours of charging = 50 miles
    1. Short 10 mins intervals, 12 per shift by each driver
        a. 2 buses in this shift
        b. = 4 hours daily charging at 4am to 2pm (= 100 miles)

iii. 2pm to Midnight = 3 hours of charging = 75 miles
    1. Short 15 mins intervals, 12 per shift by each driver
        a. 2 buses in this shift
        b. = 6 hours daily charging at 2pm to Midnight. (= 150 miles)

iv. 10pm to 8am = 3 hours of charging = 75 miles
    1. Short 15 min intervals, 12 per shift by the driver
        a. 1 bus on this shift
        b. = 3 hours daily charging at 10pm to 8am (= 75 miles)

v. Total Hours of daily Charging = 25 hours per day (= 625 miles)

f. RESULTS
    i. This use case cannot be accomplished --- due to the amount of time between trips is not possible in order to serve the customer needs --- we do not have 15 mins; therefore, we experience range anxiety in shift 2.

    ii. Electricity Usage Annually = 237,000 Vehicle Fleet Miles
        1. = 1,000% increase in my usage due to EV transportation
        2. = $43,000 removed of 12,000 gallons of diesel fossil fuel to 165,000 kwh per year

2. Electric BEV Fleet Cost per Mile with SDGE Rates

a. Use Case = 20,000 miles per month with 4 EV Bus Fleet

b. 650 miles per day = 450 kWh per day

    i. 26% current on-peak, changed from 19% peak
    ii. 31% current off-peak, changed from 23% mid-peak
    iii. 43% current super-off-peak, changed from 58% off-peak

Current Time of USE hours changed Jan 2018 in SDGE territory, number of higher kWh hours increased by 36% overall when compared to previous TOU hours and number of hours in each time period. Thereby not only has kWh rates increased, fleets that cannot schedule charging will also be impacted by rates + TOU hours.

c. **Demand Use = 75 kW of Demand**
   i. **Max Demand = 100 kW**
   ii. **Non-Coincident Demand = 100 kW**
      1. *17 kW is generated from the business operation which increases the overall cost for TE.*

d. **<u>SDGE current Commercial Rates for TE, current comparison</u>**
Rates are averaged annually for both Summer and Winter Seasons

   i. **TOU AP Current = 27 cents per kWh, 0% Demand**
      1. ***SEE SDGE temporary waiver per Advise letter 3115E***

   ii. **AL TOU Current = 38 cents per kWh, 71% Demand, per kW = $37.46**

   iii. **ML/CI, Year 1= 38 cents per kWh, 68% Demand, per kW = $35.81**

   iv. **A-TOU, Current = 21 cents per kWh, 5% Demand, per kW = $1.48 (75kW, not eligible)**

e. **<u>Diesel Fuel</u>**
   i. **Propel Diesel = 19 cents/mile, $3.80 per gallon, 20 MPG (No Zero emission)**

The above illustrations are the out the door kWh pricing that includes all fees and discounts applied to billing. This factor was important to determine the actual price for kWh in order to compare it to fossil fuels. The price per gallon at the retail pump for fossil fuels will already include all taxes, see below table for fuel tax paid for each gallon of fuel.

Taxes: in the price of fossil fuels:

(See:*http://www.trucking.org/News_and_Information_Reports_Industry_Data.aspx?)*

$41.3 billion paid by commercial trucks in federal and state highway-user taxes in 2015.

Commercial trucks make up 12.8% of all registered vehicles, and paid $18.7 billion in federal highway-user taxes and $22.6 billion in state highway-user taxes, in 2015.

24.4¢ in federal fuel tax paid for each gallon of diesel fuel as of January, 2017.

18.4¢ in federal fuel tax paid for each gallon of gasoline as of January, 2017.

27.4¢ paid on average in state fuel tax for each gallon of diesel fuel as of 2016.

23.2¢ paid on average in state fuel tax for each gallon of gasoline as of 2016.

What technology requirements should be considered for TE?

The commercial vehicles should support managed charging for fleets by integrating strategies that support robust off the grid equipment for fleet transportation stakeholders. Vehicle power level capacity should incorporate 3-phase in order to keep up with the future technology and power levels.

Microgrids and battery storage planning will support best cost and best fit when introducing a fleet to TE. Moreover, fleets will not, within the near term, move forward at 100% TE, Integration of battery storage provides immediate managed charging solutions and avoids installation cost of wires and transformers and produces a benefit to the fleet and the ratepayers.

What are the Stats on number of vehicles adopted by early TE fleets?

We can refer to the experienced TE fleets and review their adoption process to determine this fact. ***Foothill Transit*** adoption: out of a 390 vehicle fleet, in 2010 and 2012, they adopted 15 EV buses. (See: https://en.wikipedia.org/wiki/Foothill_Transit). This equates to 4% of the total fleet. Foothill Transit will be moving into more procurement for more EV's in the coming year. All other buses in their fleet are CNG (low NOx fuel buses). ***San Joaquin Regional Transit*** adopted 2 EV buses in 2013. (See: http://www.recordnet.com/news/20170818/electrifying-moment-for-city-buses).

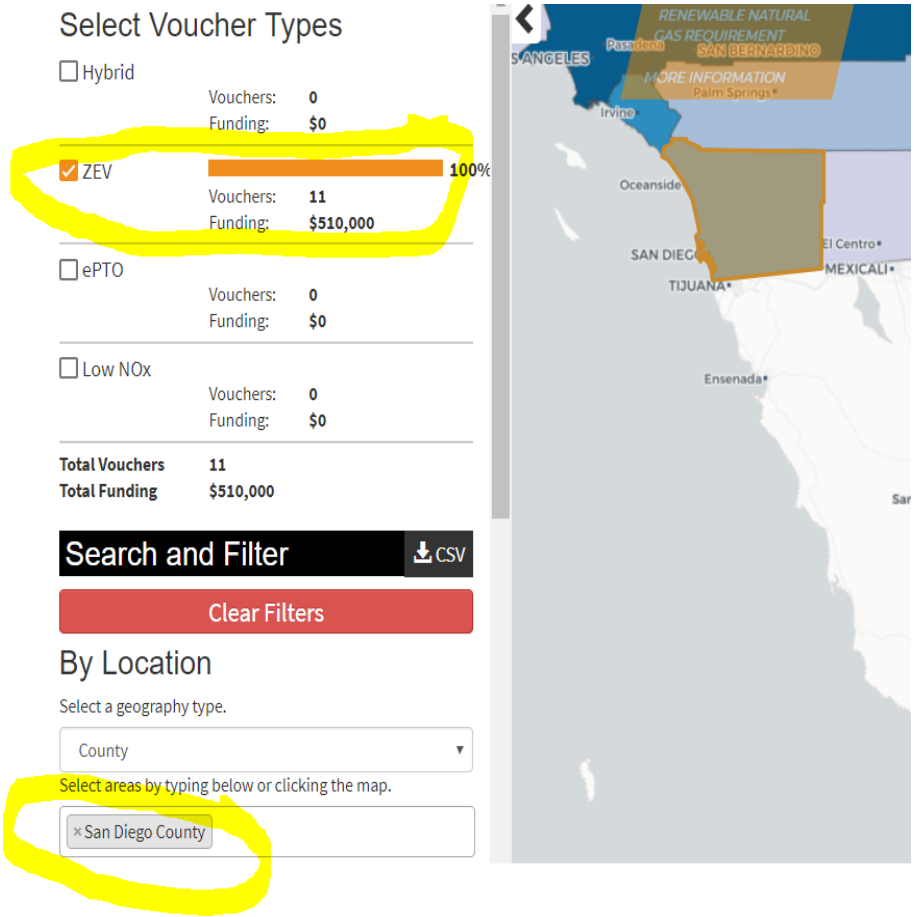
This equated to less than 1% of their fleet as they have over 500 fleet vehicles. All other vehicles in fleet are Hybrid Diesel Electric. SDAP points this out as it is important to use caution on the build out of these programs and SDAP recommends a higher number of smaller sites should be supported at 2-4 vehicles for small fleets that are under 50 vehicles and up to 5-10 vehicles for larger fleets, as the commercial sector will not be scalable for a fleet to be 100% electric without risks and huge costs; moreover, there is not one fleet that has done this to date---

not one MHD fleet has adopted at 100% toward Electric.

How many Sales for MHD have occurred in California and How many in SDGE territory?

Per the HVIP Mapping tools: ZEV's in San Diego County = 11

See: https://www.californiahvip.org/tools-results/#mapping-tool



Per the HVIP Stats on the Eligible EV Technologies, the following MHD vehicles sales and results are current as of 8-1-18 and encompass the history since 2009 when the HVIP began. The following table below demonstrates a stark fact that the MHD space and the EV technology has

very few sales. There has been a total of 573 sales since 2009 and 63% or 365 vehicles out of the 573 are currently from Vehicle Manufacturers that are out of business; thereby the HVIP currently has a total of 208 EV sales from the existing OEM's in California. Since 2013 and thru to date the HVIP sales have averaged 53 sales per year.

The MD vehicles sales make up 122 or 58% of the 208 current HVIP sales and 86 sales make up the HD.

HVIP Data updated last on 8-1-2018 https://www.californiahvip.org/eligible-technologies/

Model Year Sales

1	Model Year 2009-10	1	0.17%	
2	Model Year 2010-11	305	**53.23%**	
3	Model Year 2011-12	55	9.60%	
4	Model Year 2012-13	0	0.00%	0.00%
5	Model Year 2013-14	39	6.81%	6.81%
6	Model Year 2014-15	35	6.11%	6.11%
7	Model Year 2015-16	57	9.95%	9.95%
8	Model Year 2016-17	81	14.14%	14.14%
8	**Total over 8 Years**	**573**	**100.00%**	**37.00%**
				Last 5 Years

Vehicle Class Sales

1	LDA	51	8.90%
2	Class 2	0	0.00%
3	Class 3	88	15.36%
4	Class 4	8	1.40%
5	Class 5	107	18.67%
6	Class 6	233	40.66%
7	Class 7	16	2.79%
8	Class 8	70	12.22%
8	Total ZEV	573	100.00%

Vehicle Vocation Sales

1	Beverage Delivery	29	5.06%
2	Parcel Delivery	198	34.55%
3	Other Truck	191	33.33%
4	Other Bus	22	3.84%
5	School Bus	8	1.40%
6	Shuttle Bus	80	13.96%
7	Urban Bus	45	7.85%
7	Total Vehicle Vocation Sales	573	100.00%
	Bus Sales	155	27.05%

Vehicle OEM Sales

1	BYD Motors	42	7.33%
2	Chanje	19	3.32%
3	*EVI (First Priority)*	112	19.55%
4	*Ford*	51	8.90%
5	Lion Bus	6	1.05%
6	Motiv Powers	10	1.75%
7	*Navistar (Workhorse)*	34	5.93%
8	New Flyer	0	0.00%
9	Orange EV	15	2.62%
10	Phoenix MotorCars	42	7.33%
11	Proterra	23	4.01%
12	*Smith Electric (Chanje)*	168	29.32%
13	Zenith Motors	51	8.90%
13	**Total OEV ZEV Sales**	**573**	**100.00%**

OEM Sales Increase since: 12-1-2017

1	BYD Motors	40	2	(Bus)
2	Chanje	0	19	(Truck)
3	Lion Bus	0	6	(Bus)
4	Motiv Powers	10	0	(Truck/Bus)
5	New Flyer	0	0	(Bus)
6	Orange EV	0	15	(Truck)
7	Phoenix MotorCars	42	0	(Bus/Truck)
8	Proterra	10	13	(Bus)
9	Zenith Motors	43	8	(Bus/Truck)
	Total OEV ZEV Sales		**63**	

New OEM's

1	BYD	42	7.33%
2	Chanje	19	3.32%
3	Lion Bus	6	1.05%
4	Motive Powers	10	1.75%
5	New Flyer	0	0.00%
6	Orange EV	15	2.62%
7	Phoenix MotorCa	42	7.33%
8	Proterra	23	4.01%
9	Zenith Motors	51	8.90%
9		208	36.30%

Overall Total ZEV Sales ***573*** ***100.00%***

HVIP Funding = $33 Million to date for ZEV's

We Need 150,000 Trucks to Meet Reduction Goal

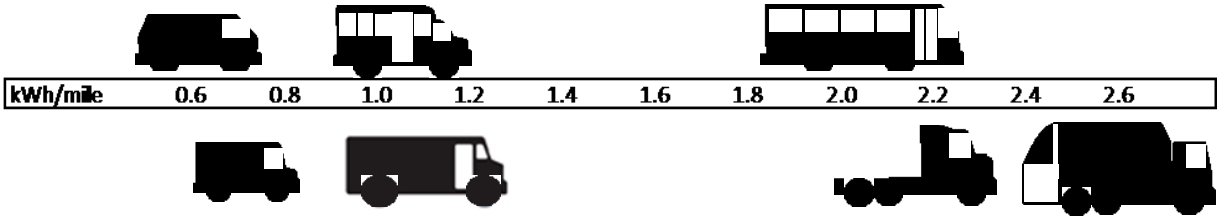
Extinct OEM's

1	EVI	19.55%	112	Model Year 2010-11
2	Ford (LDA)	8.90%	51	Model Year 2010-11
3	Navistar	5.93%	34	Model Year 2010-11
4	Smith Electric	29.32%	168	Model Year 2010-11 and 2011-12
4		63.70%	365	

What are the Efficiency in the EV transportation MHD Vehicles?

Class 2B-3	Class 4-7	Class 8
Class 2B-3 8,501-14,000 lb. GVWR	Class 4-7 14,001-33,000 lb. GVWR	Class 8 33,001+ lb. GVWR

Average kWh per mile for each class:

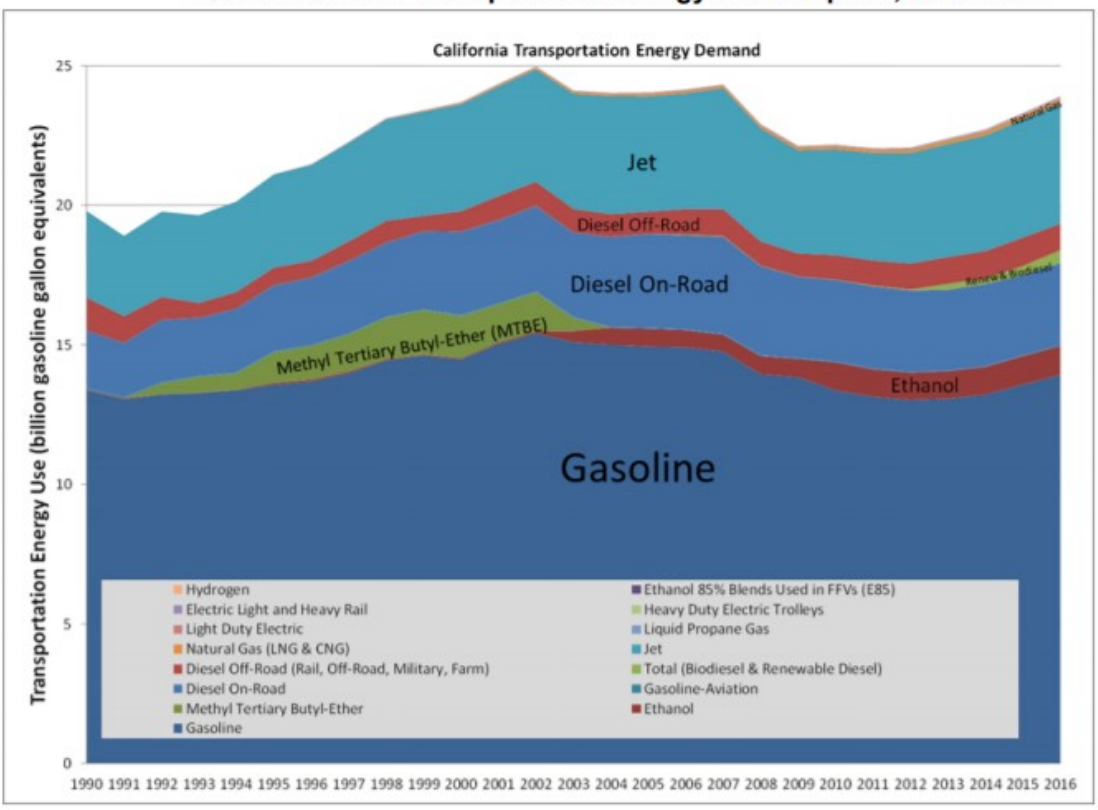


How can the plans support Widespread ZEV adoption and reduce dependence on Petroleum and greenhouse gas emissions? What can be improved to accomplish this reasonably?

The plans are designed to reduce pollutions but there should be a target towards diesel fuel vehicles and fleets and not toward fleets that already have a low NOx solution fuel and fleet as the displacement from Low NOx to ZEV is not as beneficial to our air quality as Diesel to ZEV; thereby a metric to prioritize and aggressively target diesels should be required. It is important to understand the historical context of California's transportation energy consumption and which fuels dominate. California's historical demand for transportation fuels reflects a significant dependence on gasoline, diesel, and jet fuel, as shown in the table below. The transportation sector

in California consumed more than 23.2 billion gasoline gallon equivalents (GGEs) of energy in 2015, of which 21.8 billion (or 94 percent) were fossil fuels. However, since the 2012 economic growth and declining crude oil prices, this has led to an increase in overall fuel consumption in transportation. (See CEC report for following tables: TN223241_20180419T132415_Revised_Transportation_Energy_Demand_Forecast_20182030.pdf)

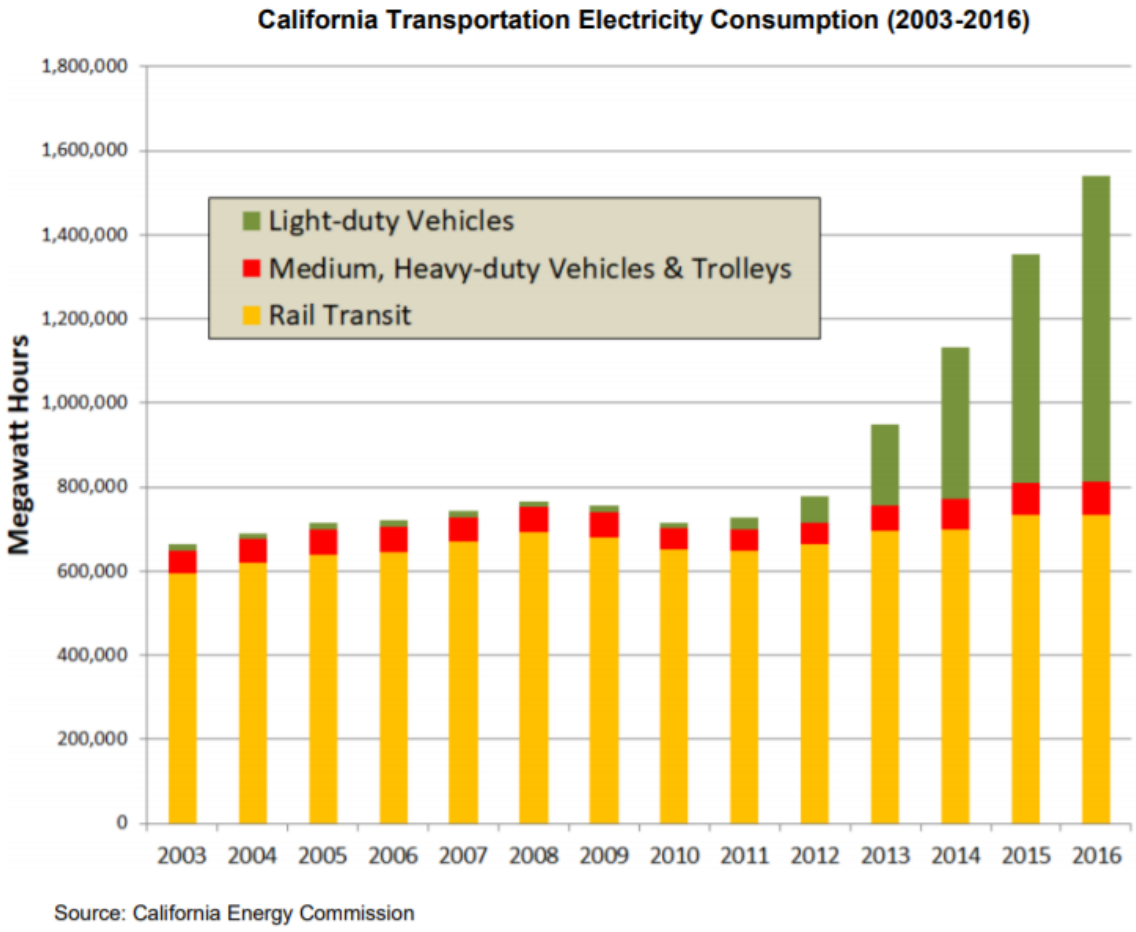
California Total Transportation Energy Consumption, 1990-2016



Source: California Energy Commission analysis of data from the Petroleum Industry Information Reporting Act, industry sales reports and the California Department of Tax and Fee Administration (http://www.cdtfa.ca.gov/taxes-and-fees/spftrpts.htm), adjusted to better estimate total fuel consumption rather than taxable use of fuels. "MTBE" is methyl tertiary butyl ether, an additive that was banned by the California Legislature in 2003. "Ethanol" includes ethanol used as an octane booster to gasoline as well as E85. "Other Fuels" includes aviation gasoline, biodiesel, electricity, hydrogen, natural gas, and propane.

An over-view of the Transpiration sector that provides the amount of electricity consumed in California's transportation sector. Through 2011, the clear majority of electricity had been used for rail transit and trolley buses. However, since 2011, increasing sales of light-duty

PEVs have led to a rapid growth in the amount of electricity used in the transportation sector and the MHD sector has not made much progress.



Many fleets like Foot hill Transit and San Joaquin Transit are primarily already reducing emissions and pollutants thereby these projects need to also create a target on fuels displacement that result in the best benefit. The current program should include all sectors. If the vehicle fleets are aged out and the vocation falls under a measure there should be a plan to prioritize sites under a measure to adopt ZEV's. This includes Transit buses, Airport Shuttles, Government Fleets and Port Trucks for Last mile delivery.

Solutions to Manage Charging and that aligns with integrated Resource Action plans.

Power levels should be considered based on the vehicle procurement and daily VMT and the direction of the industry. Battery power levels are increasing and the MHD commercial vehicles today are not what the future will be, See CEC vehicle merit review from 8-6-18 by Proterra and Transpower.

TN224418_20180806T163030_Proterra__Revolutionizing_Transit%20(1).pdf

TN224417_20180806T162552_Medium_and_Heavy_Duty_EVs__TransPower_Progress_and_Perspectives%20(6).pdf

The EVSE should require a minimum of 3-phase make ready to support the future of all EV's and specifically the MHD vehicles that will go thru the reserve daily and many will not be able to manage charging via TOU.

See below for Delta Electronics battery storage solution for SDAP use case of 600 EV miles per day and by incorporating 50 kW of power level, SDAP can manage charging and avoid additional wires and other upgrades, can avoid and maintain a TE use of only 30 kW on the grid when battery storage is installed.

Battery storage solution:

SDAP's fleet energy cost over 10 years with ESS saves $75,000. 600 miles per day. 6 miles round trip. 100 trips per day.

2.1 Million Miles in 10 years (assuming 1 mile per kWh and is average for Medium Duty EV Bus)

System objective: Enable 50KW Fast DC charging at 20-30kW distribution transformer with no grid upgrade, and maintain fleet demand use effectively all-day long. Allow Power Conditioning Systems (PCS) "system" to operate for 4 hours per day without power from grid. The PCS will be stored in the Energy Storage System Cabinet (ESS) which eliminates the need for any trenching installation cost or other prohibitive factors on the premises with regard to location or transformer upgrades, the PCS is a Bi-directional Inverter providing DC to AC and backwards and meets all standards and certifications that are required.

Theory of operation: System is configured to provide DCDC fast charge of 4.17 kWh in 5-minute charge cycles every 10-15 minutes. Accordingly, this design meets the needs of a use case for 600

miles per day with driving patterns that will require day time short incremental charging as the daily fleet vehicle miles traveled will go beyond the range of the vehicle plus the fleet has limited availability to night time charge. This will provide up to 6 times per hour, or 108 times in the busiest 18-hour period. It is expected that full charge/discharge cycles will occur between 18 hours of 6:00am and 12:00 midnight. The vehicles can be topped off at night at less frequent intervals whenever most cost-effective to avoid additional loads on the grid when multiple buses are charging at the same time.

System will draw a maximum of 20-30kW from the grid at any time, and the battery will buffer energy to provide additional power between charges to support the 50kW EV charge requirement. This system will supply enough energy to maintain the fleet demand while supporting its daily vehicles miles traveled (VMT) including simultaneous night charging. The system is sized as shown below to sustain discharging capacity for 4 hours daily on battery power alone in order for the utility or the fleet to curtail power during peak demand, or if the grid is having a circuit or system event and thereby the grid is overloaded or the grid or charging is not available; nonetheless the PCS will act as an emergency hub for the Transportation Electrification Fleet.

Lifetime of Cycles

1. 105 kwh x 4,000 = 420,000 kwh
2. 4,000 cycles
3. 4% cycles at 4 kWh x 100 times per day = up to 400 daily cycles
4. Depending on how many "Full" cycles of 100 kWh are used daily will determine the amount in years for the full lifetime.

Budget

1. $150,000 installed

Warranty

1. System: 10 years.
2. Battery Guaranteed for 400,000 kWh: 8 % onetime fee or $4,000

System advantages

1. Enables 50kW DC fast charging on 20 or 30kW distribution transformer
2. Eliminates transformer upgrades
3. Small battery can maintain capacity needed for 600-daily VMT fleet with charging capacity speeds at 50 kW
4. Eliminates demand spikes to grid
5. Grid power can be curtailed at any time for 4 hours
6. Manages Charging based on 'Demand of Use'
7. Fleet can stay on the road beyond the short range of the vehicle
8. Energy can be supplied modularly in 100kWh and 500kWh increments
9. Single PCS can support 2 simultaneous 50KW charges

10. Power can be increased in 125kWh increments
11. PV Solar can be added to eliminate daytime power draw from grid
12. Skidded solution can be provided to ease installation and relocation
13. System can be configured to support multiple chargers discharges simultaneously
14. Can enable more DCDC fast chargers and Level 2 chargers if needed.
15. System can be reconfigured if assumptions change, or system needs to be optimized for larger fleet consumption.

Considerations not included:

Property demand kW use is not included, and Taxes are not included under the analysis

No increases in rates.

Further reduction in cost:

Time Shifting could be accomplished at peak time hours and thereby do not charge anything at peak time hours.

Proposed system configuration

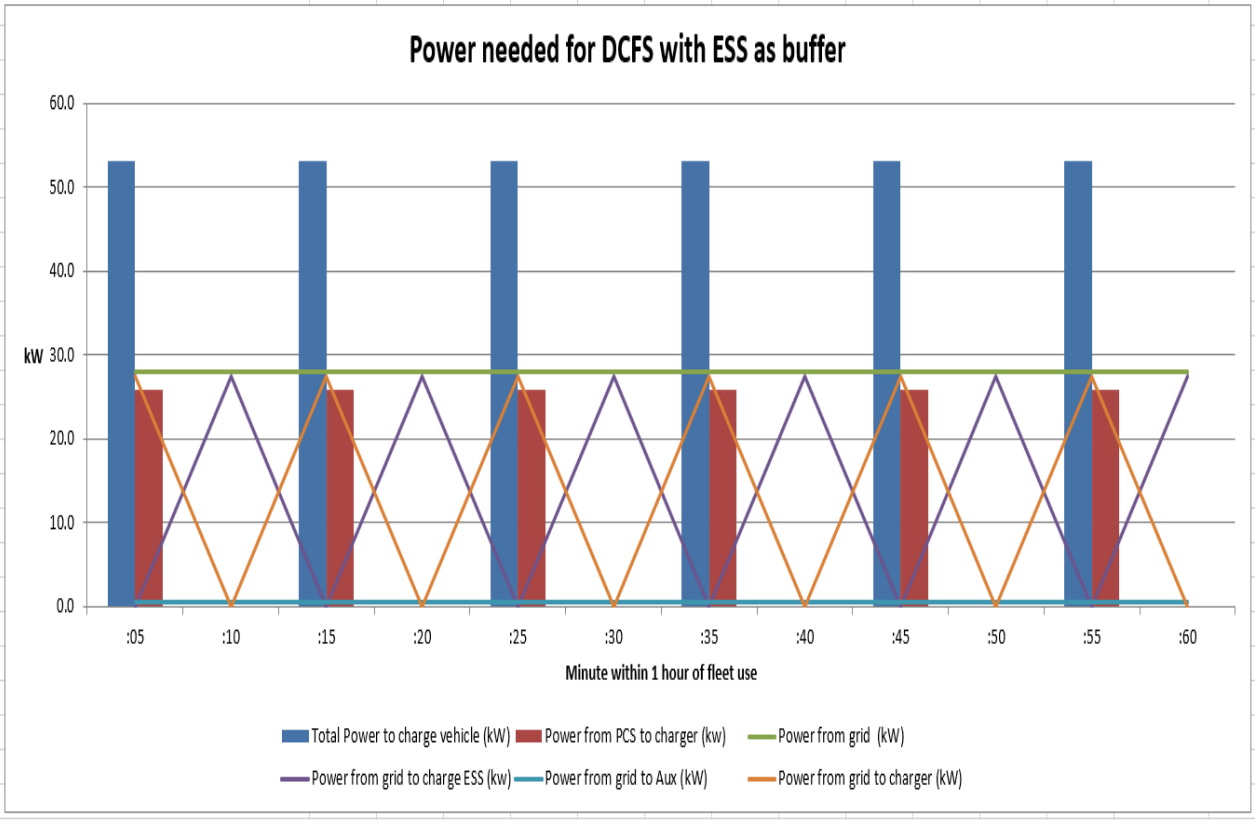
- 1 125kW PCS
- 1 100kWh ESS cabinet
- 1 50kW DCDC fast charger

System is modular and can be expanded to add power, energy, and the quantity of charging stations.

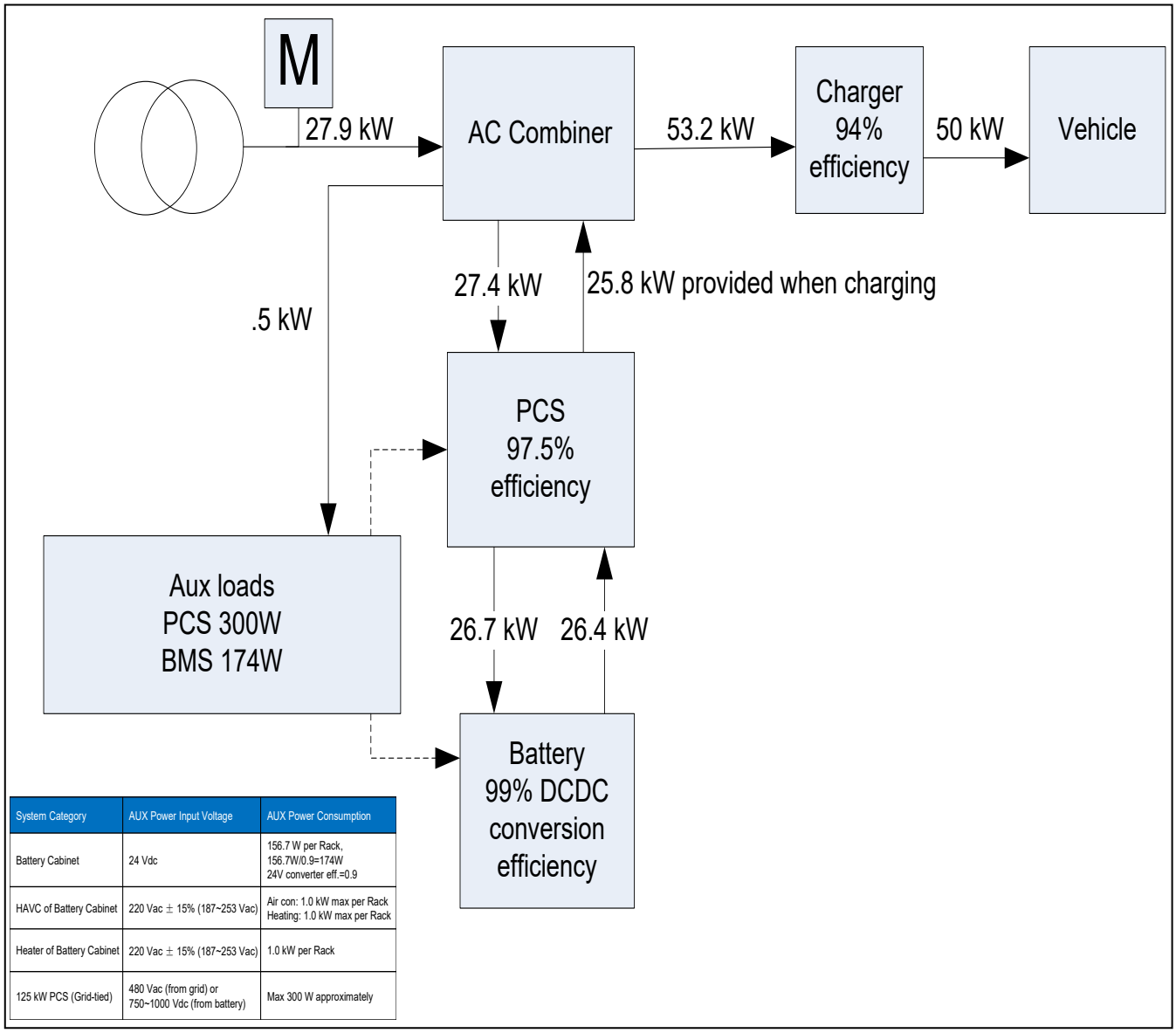
System can be provided on skid.

Proposed ESS management

Minute	:05	:10	:15	:20	:25	:30	:35	:40	:45	:50	:55	:60	total 1 hour
Total Power to charge vehicle (kW)	53.2	0	53.2	0	53.2	0	53.2	0	53.2	0	53.2	0	
Power from PCS to charger (kw)	25.8	0.00	25.8	0.00	25.8	0.00	25.8	0.00	25.8	0.00	25.8	0.00	
Power from grid (kW)	27.9	27.9	27.9	27.9	27.9	27.9	27.9	27.9	27.9	27.9	27.9	27.9	
Power from grid to charge ESS (kw)	0.0	27.4	0.0	27.4	0.0	27.4	0.0	27.4	0.0	27.4	0.0	27.4	
Power from grid to Aux (kW)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
Power from grid to charger (kW)	27.4	0.00	27.4	0.00	27.4	0.00	27.4	0.00	27.4	0.00	27.4	0.00	
Energy from grid (kWh)	2.33	2.33	2.33	2.33	2.33	2.33	2.33	2.33	2.33	2.33	2.33	2.33	27.9
Gross Battery energy to Charger	2.2		2.2		2.2		2.2		2.2		2.2		
Energy from grid to charge battery (kWh)	0.0	2.3	0.0	2.3	0.0	2.3	0.0	2.3	0.0	2.3	0.0	2.3	13.7
Net Battery energy (kWh)	102.8	105.1	102.9	105.2	103.0	105.3	103.1	105.3	103.1	105.4	103.2	105.5	
Battery Capacity gain (loss) in 1 hour (kWh)												0.5	
Battery capacity gain (loss) in 24 hours (kWh)												12.0	
energy used without battery	4.43	0.00	4.43	0.00	4.43	0.00	4.43	0.00	4.43	0.00	4.43	0.00	26.60
Charging efficiency 94%													



Proposed Single Line Diagram:



System Category	AUX Power Input Voltage	AUX Power Consumption
Battery Cabinet	24 Vdc	156.7 W per Rack, 156.7W/0.9=174W 24V converter eff.=0.9
HAVC of Battery Cabinet	220 Vac ± 15% (187~253 Vac)	Air con: 1.0 kW max per Rack Heating: 1.0 kW max per Rack
Heater of Battery Cabinet	220 Vac ± 15% (187~253 Vac)	1.0 kW per Rack
125 kW PCS (Grid-tied)	480 Vac (from grid) or 750~1000 Vdc (from battery)	Max 300 W approximately

Proposed 10 Years price plan comparison: See Table on next page.

	hours	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total Annually
AL TOU today	max power requirement (kw)	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	
	Grid energy used per hour (kWh)	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	
	energy used 10 years summer (kWh)	39,900	39,900	39,900	39,900	39,900	39,900	39,900	39,900	39,900	39,900	39,900	39,900	39,900	39,900	39,900	39,900	39,900	39,900	39,900	39,900	39,900	39,900	39,900	39,900	
	energy used 10 years winter (kWh)	57,190	57,190	57,190	57,190	57,190	57,190	57,190	57,190	57,190	57,190	57,190	57,190	57,190	57,190	57,190	57,190	57,190	57,190	57,190	57,190	57,190	57,190	57,190	27,950	
	Total kW used by hour, 10 years	97,090	97,090	97,090	97,090	97,090	97,090	97,090	97,090	97,090	97,090	97,090	97,090	97,090	97,090	97,090	97,090	97,090	97,090	97,090	97,090	97,090	97,090	97,090	67,850	
	Demand charge summer, 10 years	$ 89,961																								
	Demand charges winter, 10 years	$ 116,971																								
	Energy charges summer	$ 3,651	$ 3,651	$ 3,651	$ 3,651	$ 3,651	$ 3,651	$ 4,596	$ 4,596	$ 4,596	$ 4,596	$ 4,596	$ 4,596	$ 4,596	$ 4,596	$ 4,596	$ 4,596	$ 5,482	$ 5,482	$ 5,482	$ 5,482	$ 5,482	$ 4,596	$ 4,596	$ 4,596	$ 109,071
	Energy charges winter	$ 5,307	$ 5,307	$ 5,307	$ 5,307	$ 5,307	$ 5,307	$ 6,136	$ 6,136	$ 6,136	$ 6,136	$ 6,136	$ 6,136	$ 6,136	$ 6,136	$ 6,136	$ 6,136	$ 6,886	$ 6,886	$ 6,886	$ 6,886	$ 6,886	$ 6,136	$ 6,136	$ 2,999	$ 142,909
	Total Energy charges, 10 years	$ 458,911																								
GIR	hours	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
	max power requirement (kw)	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	
	Grid energy used per hour (kWh)	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	
	energy used 10 years summer (kWh)	39,900	39,900	39,900	39,900	39,900	39,900	39,900	39,900	39,900	39,900	39,900	39,900	39,900	39,900	39,900	39,900	39,900	39,900	39,900	39,900	39,900	39,900	39,900	39,900	
	energy used 10 years winter (kWh)	57,190	57,190	57,190	57,190	57,190	57,190	57,190	57,190	57,190	57,190	57,190	57,190	57,190	57,190	57,190	57,190	57,190	57,190	57,190	57,190	57,190	57,190	57,190	57,190	
	Total kW used by hour, 10 years	97,090	97,090	97,090	97,090	97,090	97,090	97,090	97,090	97,090	97,090	97,090	97,090	97,090	97,090	97,090	97,090	97,090	97,090	97,090	97,090	97,090	97,090	97,090	97,090	
	Demand charge summer, 10 years	$ -																								
	Demand charges winter, 10 years	$ -																								
	Energy charges summer	$ 7,290	$ 7,290	$ 7,290	$ 7,290	$ 7,290	$ 7,290	$ 7,290	$ 7,290	$ 7,290	$ 7,290	$ 7,290	$ 7,290	$ 7,290	$ 7,290	$ 7,290	$ 7,290	$ 7,290	$ 7,290	$ 7,290	$ 7,290	$ 7,290	$ 7,290	$ 7,290	$ 7,290	$ 174,963
	Energy charges winter	$ 10,449	$ 10,449	$ 10,449	$ 10,449	$ 10,449	$ 10,449	$ 10,449	$ 10,449	$ 10,449	$ 10,449	$ 10,449	$ 10,449	$ 10,449	$ 10,449	$ 10,449	$ 10,449	$ 10,449	$ 10,449	$ 10,449	$ 10,449	$ 10,449	$ 10,449	$ 10,449	$ 10,449	$ 250,780
	System top 150 hours, 150 times per year	$ 20,163																								
	Circuit top 200 hours, 200 times per year	$ 9,925																								
	Total Energy charges, 10 years	$ 455,832																								
AL TOU w ESS		01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
	max power requirement (kW)	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	
	Grid energy used per hour (kWh)	27.9	27.9	27.9	27.9	27.9	27.9	27.9	27.9	27.9	27.9	27.9	27.9	27.9	27.9	27.9	27.9	27.9	27.9	27.9	27.9	27.9	27.9	27.9	27.9	
	total enrgy used 10 years summer (kWh)	41,850	41,850	41,850	41,850	41,850	41,850	41,850	41,850	41,850	41,850	41,850	41,850	41,850	41,850	41,850	41,850	41,850	41,850	41,850	41,850	41,850	41,850	41,850	41,850	
	total energy used 10 years winter (kWh)	59,985	59,985	59,985	59,985	59,985	59,985	59,985	59,985	59,985	59,985	59,985	59,985	59,985	59,985	59,985	59,985	59,985	59,985	59,985	59,985	59,985	59,985	59,985	59,985	
	Total kW used by hour, 10 years	101,835	101,835	101,835	101,835	101,835	101,835	101,835	101,835	101,835	101,835	101,835	101,835	101,835	101,835	101,835	101,835	101,835	101,835	101,835	101,835	101,835	101,835	101,835	101,835	
	Demand charge summer, 10 years	$ 47,179																								
	Demand charges winter, 10 years	$ 61,344																								
	Energy charges summer	$ 3,829	$ 3,829	$ 3,829	$ 3,829	$ 3,829	$ 3,829	$ 4,821	$ 4,821	$ 4,821	$ 4,821	$ 4,821	$ 4,821	$ 4,821	$ 4,821	$ 4,821	$ 4,821	$ 5,750	$ 5,750	$ 5,750	$ 5,750	$ 5,750	$ 4,821	$ 4,821	$ 4,821	$ 114,401
	Energy charges winter	$ 5,567	$ 5,567	$ 5,567	$ 5,567	$ 5,567	$ 5,567	$ 6,436	$ 6,436	$ 6,436	$ 6,436	$ 6,436	$ 6,436	$ 6,436	$ 6,436	$ 6,436	$ 6,436	$ 7,222	$ 7,222	$ 7,222	$ 7,222	$ 7,222	$ 6,436	$ 6,436	$ 6,436	$ 153,184
	Total Energy charges, 10 years	$ 376,107																								

Vehicle purchases

HVIP funding has programs for funding of vehicles thereby School buses that have had other V2G programs should not be funded by ratepayers at $48,000 each.

Target:

Target of full rebates should include all MHD vocations that fall under the regulatory measure to adopt ZEV's; thereby, this should also include Airport Shuttle buses.

MD vehicles and HD vehicles should be targeted fairly as the MD sector is the most popular and

On-Road Registered California Vehicle Stock by Sector, 2015

Fuel Type	Light-Duty				Medium- and Heavy-Duty		Grand Total
	Commercial	Personal	Rental	Government	Truck and Motorhome	Other Buses (School, Shuttle,	
Diesel	404,808	150,245	1,504	5,545	685,041	10,460	**1,257,603**
Diesel-Electric Hybrid					401		**401**
Direct Electric							**0**
Electric	7,438	77,866	511	1,272	952	154	**88,193**
E85/Gasoline	280,633	1,140,411	82,115	51,254			**1,554,413**
Gasoline	2,759,199	22,331,585	323,039	140,485	273,442	27,150	**25,854,900**
Gasoline-Electric Hybrid	135,987	738,035	4,637	12,247		3	**890,909**
Hydrogen Fuel Cell	73	106		18			**197**
Natural Gas	8,445	15,956	21	3,222	8,436	5,137	**41,217**
Plug-In Hybrid	4,472	79,344	107	494			**84,417**
Propane					1,122	4,634	**5,756**
Total	**3,601,055**	**24,533,548**	**411,934**	**214,537**	**969,394**	**47,538**	**29,778,006**

Source: California Energy Commission Analysis of DMV data

(SEE CEC Report from 8-6-18: Docket Number: 15-MISC-04 Project Title: Fuels and Transportation Merit Review, TN Number: 224418)

Rates Design and Demand Charges

The programs should require an opportunity to achieve off grid charging rates. Fleets require rates and one territory as large as SDGE is the most Southern California IOU location and their rates can affect the decisions of fleets at over 100% more than LADWP rates; plus fleet corridors will cross over into other territories.

Funding for EVSE and Ownership.

HVIP program already include $30k per EVSE per vehicle. See HVIP implementation manual.

EVSE ownership should not be allowed by Utility for commercial use.

Higher power levels > not every EV vehicle procured requires an EVSE when the power level of DCFC charging is available from the vehicle.

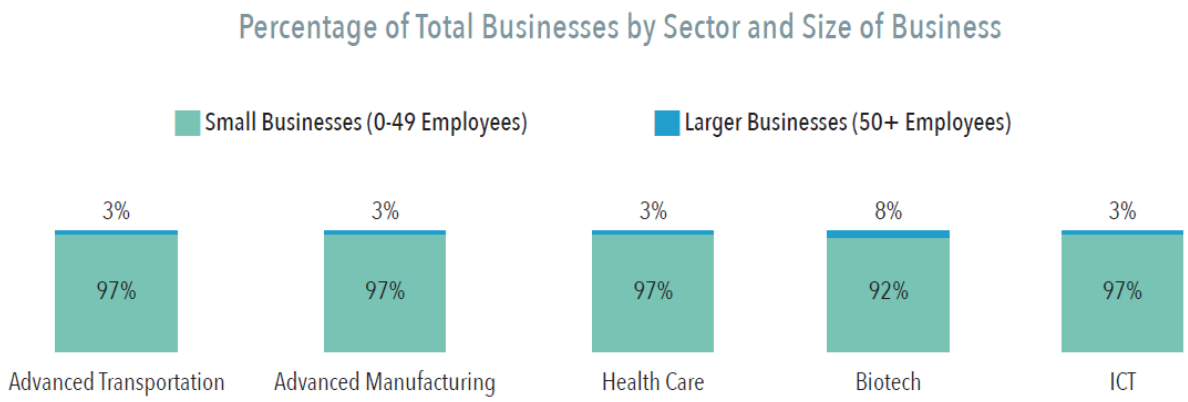
Stranded Assets.

Moving slower is recommended, we have no standards in this sector.

Small business and Small Fleets

In the US small businesses are often recognized as the "incubator for innovation". In San Diego, small business is essential to the region's economy and workforce because of the significant impact in all industries. Firms with fewer than 50 employees make up 95 percent of all establishments and account for nearly one-half of the workforce in San Diego.

See the illustration below for the percentage of total business by sector and size of business.



95% of the commercial businesses industry is made up by small business and employ over 655,000 employees today.

In 2015, small businesses (including owner-operated firms) employed approximately 568,000 workers. By 2016, total employment in small businesses is expected to grow by 15 percent, or 87,800 positions.

Estimated Employment Projections for Small Businesses in San Diego into 2016

Business Size	Current employment	Employment in 12 months	Change	% Change
1-4 Employees	105,800	139,100	33,300	31%
5-9 Employees	83,500	96,700	13,200	16%
10-19 Employees	123,300	138,100	14,800	12%
20-75 Employees	255,300	281,800	26,500	10%
Total	**567,900**	**655,700**	**87,800**	**15%**

There are current challenges that small businesses are facing in San Diego due to the number of regulatory requirements or changes, legislative mandates, new rules, zoning requirements, labor laws, environmental regulations, and high tax. Considerations need to be established for Small Business' to be prioritized the same as the DAC and Low Income communities for the main reason that in the current Pilot Programs most of the pilot sites are being installed only in large commercial business or municipalities that are the most likely to be able to afford the investment to install EV infrastructure and the most willing to sign the Pilot agreements that is being required by the IOU's from the customer in order to be eligible for the pilot programs; moreover, the agreement requires a long term commitment. Small business' will be harmed by environmental regulations if there continues to be disproportionately funded pilots that favor large commercial business over small business, plus small businesses are less financially capable of having the cash resources, time, and ability to be gain the education to learn about the technology and environmental regulations. Therefore, any efforts intended to accelerate ZEV adoption must not negate the small commercial businesses that make up 95% of the businesses in San Diego. The pilot programs to date are imposing agreements that require further examination by this commission as this creates additional hardships on the small private sector that cannot compete with large commercial entities or municipalities that are privileged to have many other sources and options for funding that is not available to small business or private business. The following guidelines will promote fairness in transportation:

- Ensure that the level and quality of ZEV transportation service is provided without regard to race, color, or national origin;
- Promote the full and fair participation of all affected small transportation business's in the decision making;

- Prevent the denial, reduction, or delay in benefits related to programs and activities that could benefit small business, minority or low-income populations;
- Ensure meaningful access to programs and activities by the small business sector and private sector

How can the IOU's address the Demand rates?

The State and Agencies should order a Transportation Commercial Rate be developed for EV charging. Rates need to complement each fleet application as there are small fleets, medium fleets and large fleets. See below cost affects as per size of fleet and the difference of 2 cents on the cost per mile. Most importantly depending on the daily fleet miles traveled and the power flow this will also have a big effect on cost per mile, but we do not know enough about the effects. Rates will affect choice. We look forward to seeing a proposal for choices on EV fleet rates.

Cost per Mile effect on Fleets when it is MORE.

f. Small Commercial Fleet at 240k miles per year

g. 0.2 cents more per mile = $4,800 more per year
h. 0.3 cents more per mile = $7,200 more per year
i. 0.4 cents more per mile = $9,600 more/year

j. Medium Size Commercial Fleet at 5 Million miles per year: 100 buses

k. 01 cents more per mile = $50k more per year.
l. 0.2 cents more per mile = $100k more per year
m. 0.4 cents more per mile = $200k more per year

n. Large Size Commercial Fleet at 14 Million miles per year: 150+ buses

Transit Operation = $5M per year in fuel and 14M miles annually

o. 01 cents more per mile = $140k more per year.
p. 0.2 cents more per mile = $280k more per year
q. 0.4 cents more per mile = $560k more per year

Dated: August 20, 2018

By: _____/s/ Lisa McGhee_____

San Diego Airport Parking Company
2771 Kurtz St.,
San Diego, CA. 92110
Telephone: 619-574-1177
sdap@sdap.net, lisamcghee@aol.com

EXHIBITS:

HVIP VOUCHER REBATES: 2018 HVIP MANUAL PAGES 21-25

Industry	Respondent Vehicle Population			Statistics			
	2B to 3	4 to 7	8	Daily Mileage	Annual Mileage	Years in Fleet	Overnight return to base
California State Fleet	15,915	3,960	3,180	-	6,400	-	-
Gov't/Public	1,172	585	325	30	10,000	11	100%
Utility	656	784	214	50	10,000	12	67%
Construction	25	50	1,270	100	18,000	10	90%
Equipment Rental/Dismantler	0	118	85	115	28,500	10	100%
Retail	590	888	117	150	36,000	9	100%
Total Vehicles by Class	18,358	6,385	5,191				

Link to Survey https://www.arb.ca.gov/msprog/actruck/docs/acltsurvey18.docx 10

EXHIBITS:

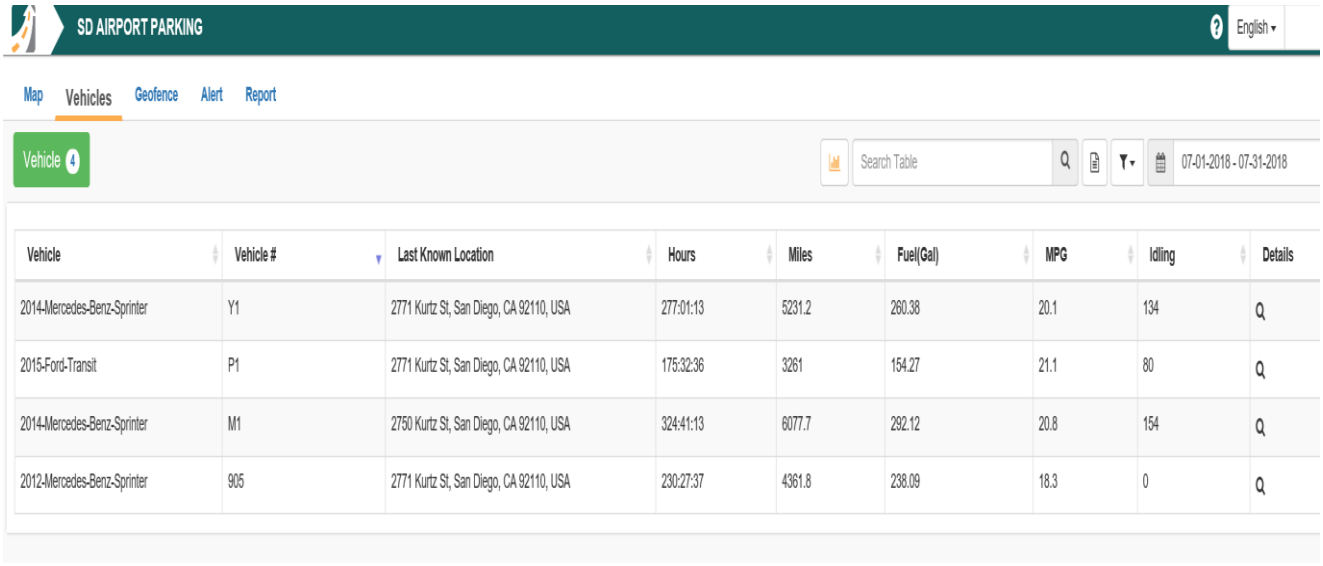
HVIP VOUCHER REBATES: 2018 HVIP MANUAL PAGES 21-25

Funding Table for Zero Emission Trucks

GVWR (lbs)	Base Voucher Incentive	
	1-100 vehicles	
	Outside DAC	Inside DAC
5,001-8,500	$20,000	$25,000
8,501-10,000	$25,000	$30,000
10,001-14,000	$50,000	$55,000
14,001-19,500	$80,000	$90,000
19,501-26,000	$90,000	$100,000
26,001-33,000	$95,000	$110,000
>33,001	$150,000	$165,000
Hydrogen FC	$300,000	$315,000

EXHIBITS:

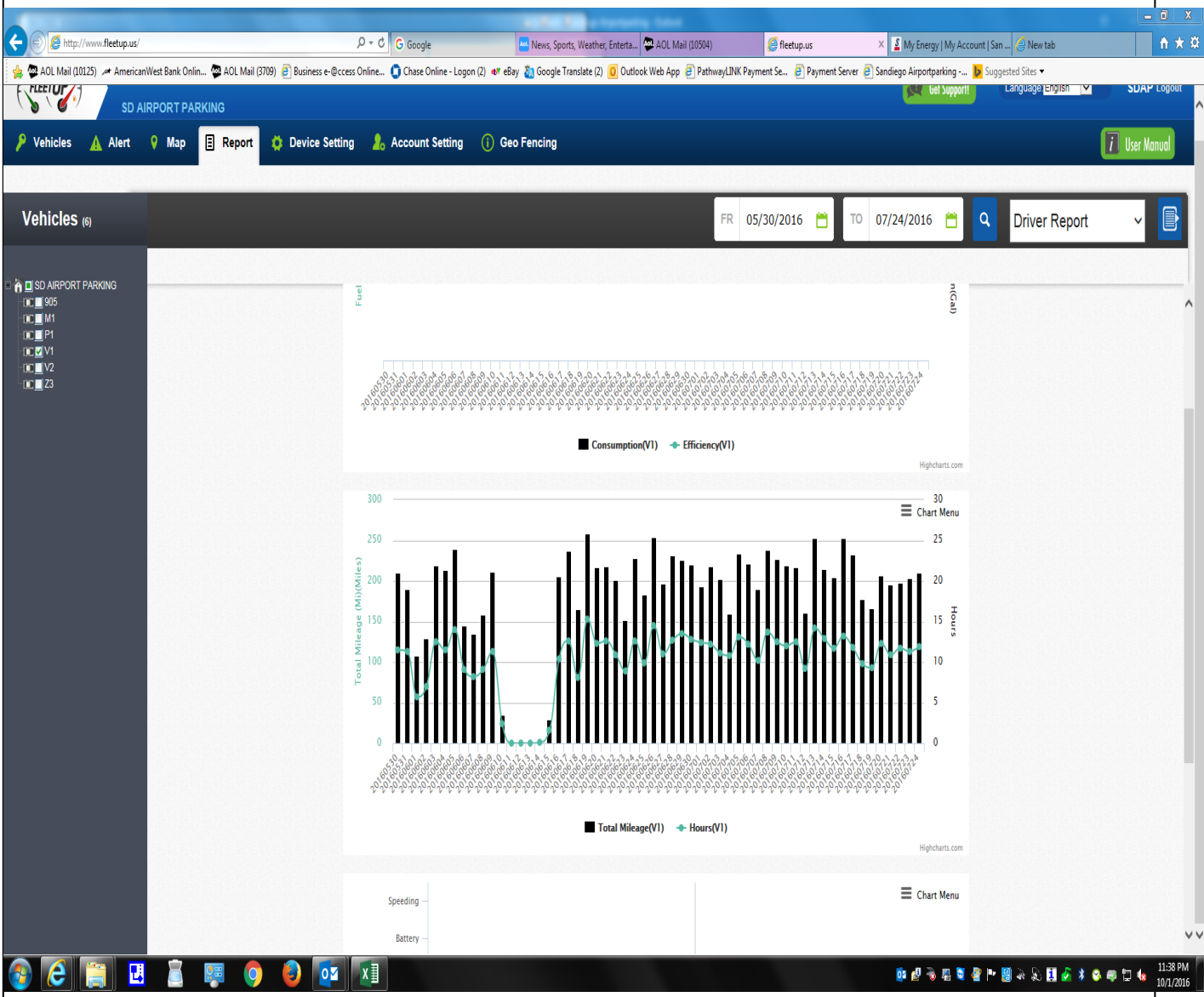
Diesel Fuel Economy Mileage as of July 2018 for Class 2b Shuttle Vans



Vehicle	Vehicle #	Last Known Location	Hours	Miles	Fuel(Gal)	MPG	Idling	Details
2014-Mercedes-Benz-Sprinter	Y1	2771 Kurtz St, San Diego, CA 92110, USA	277:01:13	5231.2	260.38	20.1	134	
2015-Ford-Transit	P1	2771 Kurtz St, San Diego, CA 92110, USA	175:32:36	3261	154.27	21.1	80	
2014-Mercedes-Benz-Sprinter	M1	2750 Kurtz St, San Diego, CA 92110, USA	324:41:13	6077.7	292.12	20.8	154	
2012-Mercedes-Benz-Sprinter	905	2771 Kurtz St, San Diego, CA 92110, USA	230:27:37	4361.8	238.09	18.3	0	

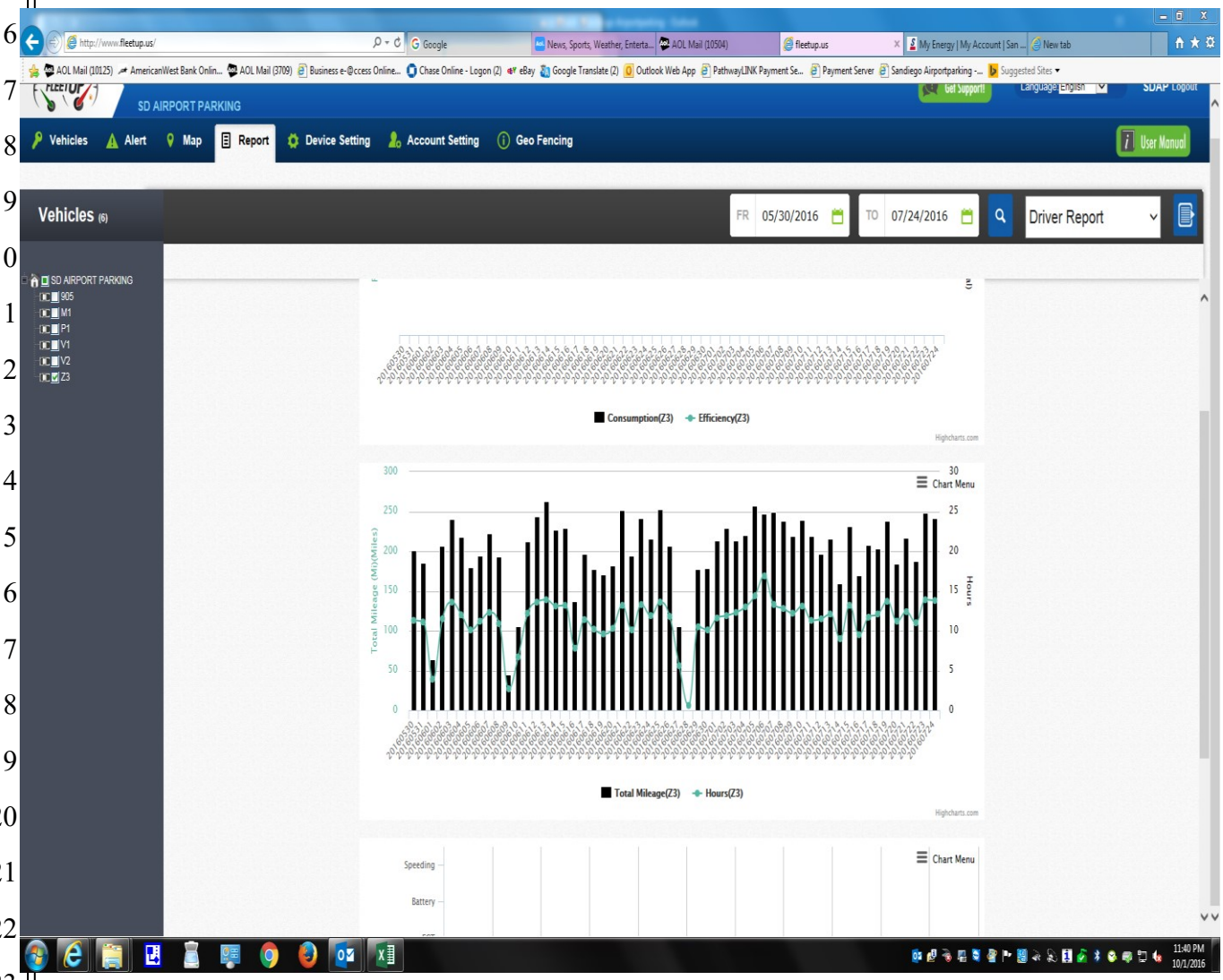
EXHIBITS:

Electric Vehicle Daily Mileage: Class 3 EV Shuttle Bus, Started in Fleet May 2015



EXHIBITS:

Electric Vehicle Daily Mileage: Class 3 EV Shuttle Bus, Started in Fleet March 2016



EXHIBITS:

Image Shuttle Bus, Class 3

EXHIBITS:

Ford Diesel 2019 Shuttle Bus, Class 3, Purchase Price: $50,000

Fritts Ford
8000 Auto Drive, Riverside, California, 925044193
Office: 951-687-2121

2019 Transit-350, High Roof HD Ext. Passenger Van
High Roof HD Ext. Passenger Van 147.6" WB DRW XL(U4X)
Price Level: 315

Selected Options

Code	Description	MSRP
Base Vehicle		
U4X	Base Vehicle Price (U4X)	$43,770.00
Packages		
301A	Order Code 301A *Includes:* *- Transmission: 6-Speed Automatic w/OD & SelectShift Includes auxiliary transmission oil cooler.* *- 4.10 Axle Ratio* *- GVWR: 10,360 lbs* *- Tires: 195/75R16C AS BSW* *- Wheels: 16" Silver Steel w/Exposed Lug Nuts*	N/C
Powertrain		
99V	Engine: 3.2L Powerstroke I5 Diesel *Includes PTC heater and SEIC capability.* *Includes:* *- Cruise Control w/Message Center Includes full trip computer and engine-hour meter.* *- Dual Heavy-Duty Batteries 70 amp-hr each. Includes absorbed glass mat.* *- Engine Block Heater (400W rating).*	$3,995.00
446	Transmission: 6-Speed Automatic w/OD & SelectShift *Includes auxiliary transmission oil cooler.*	Included
X41	4.10 Axle Ratio	Included
STDGV	GVWR: 10,360 lbs	Included
Wheels & Tires		
STDTR	Tires: 195/75R16C AS BSW	Included
STDWL	Wheels: 16" Silver Steel w/Exposed Lug Nuts	Included
Seats & Seat Trim		
21M	Charcoal Black Cloth Dual Bucket Seats *Includes 2-way manual driver seat, 2-way manual passenger seat, driver seat manual lumbar adjust and driver and passenger armrest.*	$200.00
C	Cloth Front Bucket Seats	N/C
Other Options		
PAINT	Monotone Paint Application	STD

Prices and content availability as shown are subject to change and should be treated as estimates only. Actual base vehicle, package and option pricing may vary from this estimate because of special local pricing, availability or pricing adjustments not reflected in the dealer's computer system. See salesperson for the most current information.

Prepared by [redacted] Date: 08/10/2018

1

Fritts Ford
8000 Auto Drive, Riverside, California, 925044193
Office: 951-687-2121

2019 Transit-350, High Roof HD Ext. Passenger Van
High Roof HD Ext. Passenger Van 147.6" WB DRW XL(U4X)
Price Level: 515

Selected Options (cont'd)

Code	Description	MSRP
148WB	148" Wheelbase	STD
63E	Dual Heavy-Duty Batteries *70 amp-hr each. Includes absorbed glass mat.*	Included
41H	Engine Block Heater Recommended when minimum temperature is 10 degrees F or below. *(400W rating).*	Included
153	Front License Plate Bracket Standard in states requiring 2 license plates and optional to all other states.	N/C
43R	Reverse Sensing System	$295.00
542	Short-Arm Htd Power-Folding Mirrors w/Turn Signals	$225.00
86F	2 Additional Keys (4 Total) *Includes key fobs.*	$75.00
60C	Cruise Control w/Message Center *Includes full trip computer and engine-hour meter.*	Included
58V	Radio: AM/FM Single-CD Stereo *(19). Includes audio input jack and 4" multi-function display.*	$130.00
43B	Back Up Alarm	$125.00
Emissions		
425	50-State Emissions System *Standard equipment on all non-FFV vehicles including the 3.5L EcoBoost V6 and 3.2 I-5 diesel engines. Required for 3.7L Ti-VCT engines shipped to California emission state dealers (CA, CT, DE, MA, MD, ME, NJ, NY, OR, PA, RI, VT, WA). Optional for 3.7 Ti-VCT engines shipped to cross border state dealers (AZ, DC, ID, NH, NV, OH, VA, WV) and fleet orders.*	N/C
Interior Colors		
CB_02	Charcoal Black	N/C
Primary Colors		
YZ_01	Oxford White	N/C
SUBTOTAL		$48,815.00
Destination Charge		$1,395.00
TOTAL		$50,210.00

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Prepared by [redacted] Date: 08/10/2018

2

EXHIBITS:

Voucher for Shuttle Bus in 2015, Class 3: $60,000

HVIP
HYBRID TRUCK AND BUS VOUCHER INCENTIVE PROJECT

FUNDER + FY YEAR
Year 4 ARB

Date Received:
Wednesday, March 18, 2015

HVIP
Voucher Request Form

Purchaser Information

Primary Contact: David McGhee		
Company Name: San Diego Airport Parking Company	Parent Company: David McGhee DBA San Diego Airport Parking Company	
Mailing address: 2771 Kurtz St.		
City: San Diego	State: CA	Zip Code: 92110
Phone: (714) 881-4856	Fax:	
Primary E-mail: lisamcghee@aol.com		
TIN: 33-0466949 CA #: 445710 ☐ exempt	DOT #:	☐ exempt
CA # Reason for exemption (if applicable):		
DOT # Reason for exemption (if applicable): vehicles operated do not require DOT#		

Vehicle Operator Information

Operator: San Diego Airport Parking Company		
Street address: 2771 Kurtz St.		
City: San Diego	State: CA	Zip Code: 92110
Email: lisamcghee@aol.com	Phone: (714) 881-4856	

Dealer Information

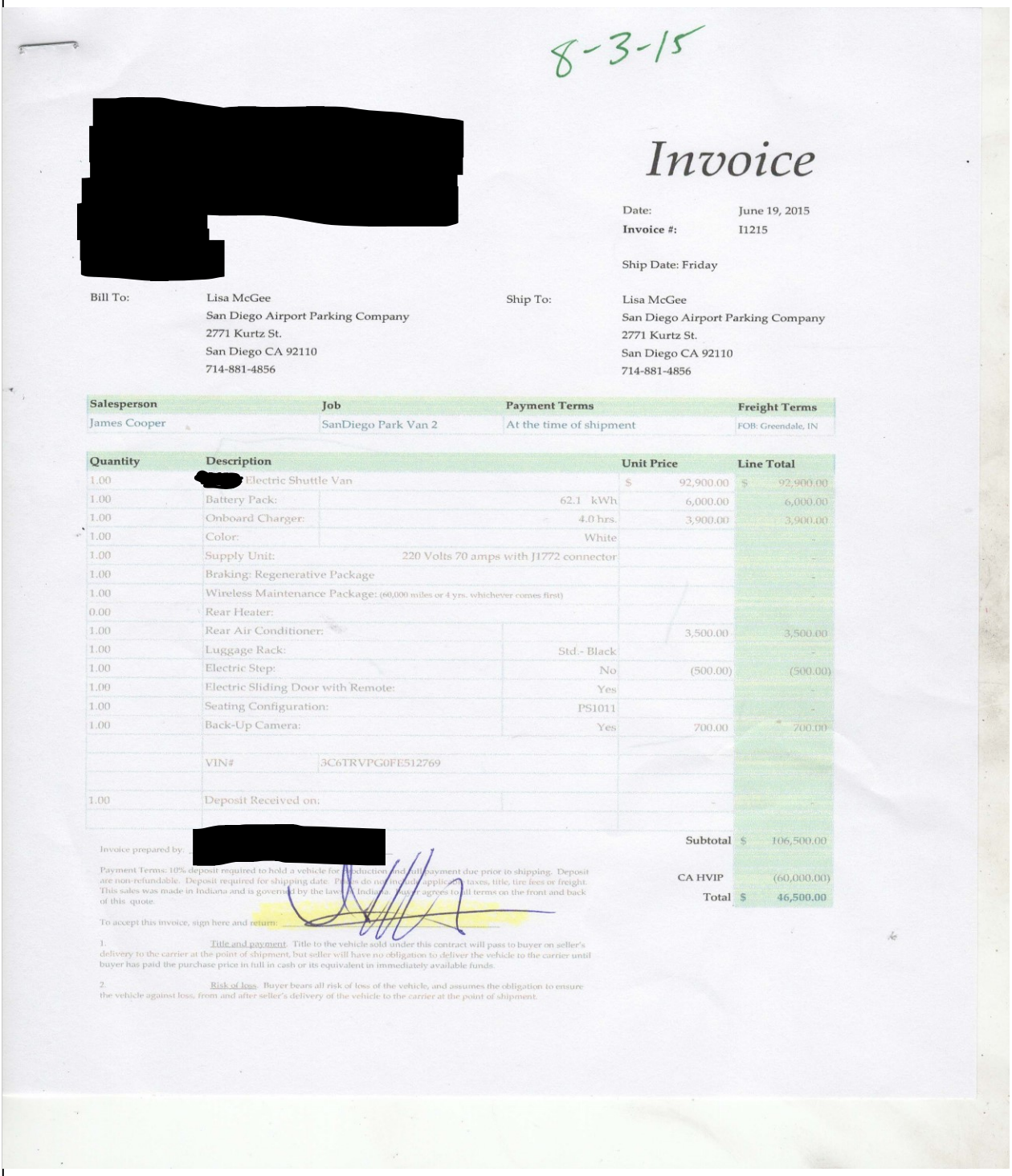
Dealer: [redacted]	Company Name: Zenith Motors Holding	
Street address: 181 US Highway 50 East		
City: [redacted]	State: [redacted]	Zip Code: [redacted]
Email: [redacted]	Phone: [redacted]	

Vehicle Information

Vehicle Manufacturer: [redacted]	Vehicle Model Year: 2014
Engine: Electric EZEND00.0ZEB	Engine Model Year: 2014
Vehicle Description: Electric Shuttle Van with Lithium-Ion 62.1kWh Battery Pack	
GVW: 10,001-14,000	Preliminary Voucher Amount: $60,000.00
Number of Vouchers Requested*: 1	

*** NOTE: The fleet/operator location and vehicle type MUST be the same.** If you are purchasing the same vehicle for the same client, but is being used at a different fleet location, you must submit a new Voucher Request.

EXHIBITS:
EV Shuttle Purchase Price in 2015, Class 3: $106,500



8-3-15

[redacted]

Invoice

Date: June 19, 2015
Invoice #: I1215

Ship Date: Friday

Bill To:	Ship To:
Lisa McGee San Diego Airport Parking Company 2771 Kurtz St. San Diego CA 92110 714-881-4856	Lisa McGee San Diego Airport Parking Company 2771 Kurtz St. San Diego CA 92110 714-881-4856

Salesperson	Job	Payment Terms	Freight Terms
James Cooper	SanDiego Park Van 2	At the time of shipment	FOB: Greendale, IN

Quantity	Description		Unit Price	Line Total
1.00	[redacted] Electric Shuttle Van		$ 92,900.00	$ 92,900.00
1.00	Battery Pack:	62.1 kWh	6,000.00	6,000.00
1.00	Onboard Charger:	4.0 hrs.	3,900.00	3,900.00
1.00	Color:	White		-
1.00	Supply Unit:	220 Volts 70 amps with J1772 connector		-
1.00	Braking: Regenerative Package			-
1.00	Wireless Maintenance Package: (60,000 miles or 4 yrs. whichever comes first)			-
0.00	Rear Heater:			-
1.00	Rear Air Conditioner:		3,500.00	3,500.00
1.00	Luggage Rack:	Std.- Black		-
1.00	Electric Step:	No	(500.00)	(500.00)
1.00	Electric Sliding Door with Remote:	Yes		-
1.00	Seating Configuration:	PS1011		-
1.00	Back-Up Camera:	Yes	700.00	700.00
	VIN#	3C6TRVPG0FE512769		
1.00	Deposit Received on:			-

Invoice prepared by: [redacted]

Subtotal $ 106,500.00

CA HVIP (60,000.00)

Total $ 46,500.00

Payment Terms: 10% deposit required to hold a vehicle for production and full payment due prior to shipping. Deposit are non-refundable. Deposit required for shipping date. Prices do not include applicable taxes, title, tire fees or freight. This sales was made in Indiana and is governed by the laws of Indiana. Buyer agrees to all terms on the front and back of this quote.

To accept this invoice, sign here and return:

1. Title and payment. Title to the vehicle sold under this contract will pass to buyer on seller's delivery to the carrier at the point of shipment, but seller will have no obligation to deliver the vehicle to the carrier until buyer has paid the purchase price in full in cash or its equivalent in immediately available funds.

2. Risk of loss. Buyer bears all risk of loss of the vehicle, and assumes the obligation to ensure the vehicle against loss, from and after seller's delivery of the vehicle to the carrier at the point of shipment.

EXHIBITS:

2018 EV Power Train Purchase Price, Class 3: $96,000 + $46,000 = $142,000

(EV power train still needs to be upfitted onto newly purchased Class 3 shuttle gasoline van at $46,000)

[redacted]

Customer Quotation

Date: 11/3/2017
Quote: Q11032017-01

Contact: [redacted]
Email: [redacted]

Sold To:	**Ship to installation location:**
San Diego Airport Parking Company 2771 Kurtz Street San Diego, California 92110 www. Sdap.net	[redacted]
Contact:	**Contact:**
Lisa McGhee lisamcghee@aol.com	

Seller	Payment Terms	Carrier		Promised Ship date
T Scholl	Net 30	Best way		2/28/2018

Item #	Type	Number/Description	USD Unit Price	Qty Ordered	USD Total Price
1	Sale	[redacted]Electric Transit EV Electric Vehicle Conversion [redacted]100 (Refer also to Item #12 Notes)	$89,000.00	2	$178,000.00
2	Sale	Option: DC Fast Charge (up to 50kW) using Connector Type SAE J1772 CCS Combo	$4,995.00	2	$9,990.00
3	Sale	Option: Upgraded 12 V Battery System support for additional accessories	$995.00	2	$1,990.00
4	Sale	Option: Analytics (predictive maint, route scoring, range analysis, driver behavior) includes hardware and 12 month subscription	$995.00	2	$1,990.00
		SUBTOTAL FOR LE 100 CONVERSION	$95,985.00		$191,970.00
5	Install	Installation	INCLUDED		INCLUDED

EXHIBITS:

Ford Gasoline 2019 Shuttle Bus, Class 3, Purchase Price: $46,000

Fritts Ford
8000 Auto Drive, Riverside, California, 925044193
Office: 951-687-2121

2019 Transit-350, High Roof HD Ext. Passenger Van
High Roof HD Ext. Passenger Van 147.6" WB DRW XL(U4X)
Price Level: 915

Selected Options

Code	Description	MSRP
Base Vehicle		
U4X	Base Vehicle Price (U4X)	$43,770.00
Packages		
301A	Order Code 301A *Includes:* *- Engine: 3.7L Ti-VCT V6 Includes SEIC capability.* *- Transmission: 6-Speed Automatic w/OD & SelectShift Includes auxiliary transmission oil cooler.* *- 4.10 Axle Ratio* *- GVWR: 10,360 lbs* *- Tires: 195/75R16C AS BSW* *- Wheels: 16" Silver Steel w/Exposed Lug Nuts*	N/C
Powertrain		
99M	Engine: 3.7L Ti-VCT V6 *Includes SEIC capability.*	Included
446	Transmission: 6-Speed Automatic w/OD & SelectShift *Includes auxiliary transmission oil cooler.*	Included
X41	4.10 Axle Ratio	Included
STDGV	GVWR: 10,360 lbs	Included
Wheels & Tires		
STDTR	Tires: 195/75R16C AS BSW	Included
STDWL	Wheels: 16" Silver Steel w/Exposed Lug Nuts	Included
Seats & Seat Trim		
21M	Charcoal Black Cloth Dual Bucket Seats *Includes 2-way manual driver seat, 2-way manual passenger seat, driver seat manual lumbar adjust and driver and passenger armrest.*	$200.00
C	Cloth Front Bucket Seats	N/C
Other Options		
PAINT	Monotone Paint Application	STD
148WB	148" Wheelbase	STD
153	Front License Plate Bracket	N/C

Prices and content availability as shown are subject to change and should be treated as estimates only. Actual base vehicle, package and option pricing may vary from this estimate because of special local pricing, availability or pricing adjustments not reflected in the dealer's computer system. See salesperson for the most current information.

Prepared by: John Wiltsey **Date: 08/10/2018**

1

Fritts Ford
8000 Auto Drive, Riverside, California, 925044193
Office: 951-687-2121

2019 Transit-350, High Roof HD Ext. Passenger Van
High Roof HD Ext. Passenger Van 147.6" WB DRW XL(U4X)
Price Level: 915

Selected Options (cont'd)

Code	Description	MSRP
	Standard in states requiring 2 license plates and optional to all other states.	
43R	Reverse Sensing System	$295.00
542	Short-Arm Htd Power-Folding Mirrors w/Turn Signals	$225.00
86F	2 Additional Keys (4 Total) *Includes key fobs.*	$75.00
58V	Radio: AM/FM Single-CD Stereo *(10). Includes audio input jack and 4" multi-function display.*	$130.00
43B	Back Up Alarm	$125.00
Interior Colors		
CB_02	Charcoal Black	N/C
Primary Colors		
YZ_01	Oxford White	N/C
SUBTOTAL		$44,820.00
Destination Charge		$1,395.00
TOTAL		$46,215.00

EXHIBITS:

BATTERY ASSUMPTIONS: WEIGHT AND SIZE:

324kwh = 5,500 lbs. 5 feet wide x 5 feet long x 1 foot

Advanced Clean Transit Battery Cost for Heavy-Duty Electric Vehicles, 8-2016, pg 7:

https://www.arb.ca.gov/msprog/bus/battery_cost.pdf

Cell Chemistry:	LFP/graphite	
	Large Cells	Small Cells
Number of packs in parallel	3	3
Cells per pack	336	504
Cell capacity, Ah	99	66
Number of cells in parallel	2	3
Nominal battery voltage, V	551	551
Pack power, kW	133.3	133.3
Total pack energy, kWh	108	108
Useable battery energy, % of total	85	85
% OCV at full power	97.1	97.2
Bus energy requirement, Wh/mile	1,775	1,775
Pack dimensions, mm		
Length	1,647	2,425
Width	1,740	1,457
Height	169	147
Battery weight (3 packs), kg	2,525	2,636
Battery volume (3 packs), L	1,474	1,579

Source: Argonne BatPac Model

EXHIBITS:

BATTERY PACK IMAGE, BYD

Contracting documents show BYD is now conceding shorter ranges. Its most recent bid for a Metro contract still boasted extended ranges but included charging stations along bus routes to top off battery packs.

Workers install batteries on top of a bus destined for UC Irvine. BYD's business began with production of cellphone batteries. (Mel Melcon / Los Angeles Times)