WEST COAST
ELECTRIC
FLEETS

The Case for EV's in Local Government Fleets

Nov 17, 2016

Hosted by Fraser Basin Council

Charlotte Argue &
Ryan Davis
Fraser Basin Council

FBC One of Many WCEF Partners

Sponsoring Organizations

This initiative is supported by a growing list of partners working with West Coast fleets to procure ZEVs.

Clean Cities
U.S. Department of Energy

C2ES CENTER FOR CLIMATE AND ENERGY SOLUTIONS

CALSTART

Drive Oregon
Innovation in Electric Mobility

Fraser Basin Council

Pacific Coast COLLABORATIVE

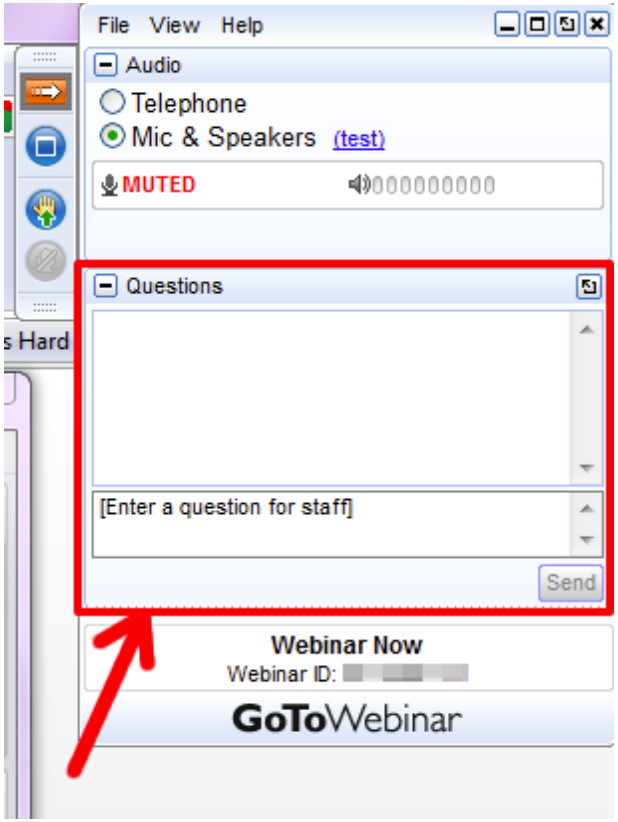
West Coast Electric Fleets is funded in part by the generous support of The 11th Hour Project and the Bullitt Foundation.

Today's Speakers

- Jessica Sutorus, Environmental Conservation Supervisor, City of Colton
- Phillip Kobernick, Sustainability Project Manager, County of Alameda

Using the GoToWebinar Panel

- All participants are muted
- Q&A at the end
- Webinar being recorded



WEST COAST ELECTRIC FLEETS

Pacific Coast COLLABORATIVE

Leadership now for a sustainable tomorrow

What is West Coast Electric Fleets?

Pacific Coast Action Plan *on* Climate and Energy

Preamble

The Governments of California, British Columbia, Oregon and Washington,

Pursuant to the *Memorandum to Establish the Pacific Coast Collaborative* of June 2008, as provided for in Article 6;

Affirming our shared vision of Pacific North America as a model of innovation that sustains our communities and creates jobs and new economic opportunities for our combined population of 53 million;

Recognizing that the Pacific Coast is a region bound together by a common geography, shared infrastructure and a regional economy with a combined GDP of US $2.8 trillion, which makes it the world's fifth largest;

existing carbon-pricing programs. Where possible, California, British Columbia, Oregon and Washington will link programs for consistency and predictability and to expand opportunities to grow the region's low-carbon economy.

2) **Harmonize 2050 targets for greenhouse gas reductions and develop mid-term targets needed to support long-term reduction goals.**

Climate scientists have identified the scale of greenhouse gas reductions that must be achieved globally to stabilize the climate. Where they have not already done so, California, British Columbia, Oregon and Washington will establish long-term reduction targets that reflect these scientific findings. To advance long-term reductions, Washington already has in place a mid-term 2035 target. California and Oregon will establish their own mid-term targets.

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West Coast Electric Fleets implements the Zero Emission Vehicle (ZEV) commitment in the Pacific Coast Action Plan on Climate and Energy

2) **Take actions to expand the use of zero-emission vehicles, aiming for 10 percent of new vehicle purchases in public and private fleets by 2016.**

The Pacific Coast already has the highest penetration of electric cars in North America. The governments of California, British Columbia, Oregon and Washington will work together towards this ambitious new target by supporting public and private fleet managers to shift their procurement investments to catalyze toward electric car purchases and by continuing to invest in necessary infrastructure to enable low-carbon electric transportation.

This goal has now expanded to include fleets that aim for more than 10% and establish a new target year of 2020!

Become a Fleet Partner

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Four-Tiered Commitment

- **On-Ramp:** Commit to **evaluate ZEVs** as part of every fleet purchase and revisit commitment annually
- **Highway:** Commit to procuring at least **3% of ZEVs** for all new fleet purchases by the end of 2016 and revisit the pledge annually
- **Express Lane:** Commit to procuring at least **10% ZEVs** for all new fleet vehicle purchases by the end of 2016
- **Diamond Lane:** Committing to __% ZEVs for all new fleet vehicle procurement by year ____

WEST COAST ELECTRIC FLEETS

You can complete this form online at westcoastelectricfleets.com, email a scanned copy to info@westcoastelectricfleets.com, or fax it to (206) 447-0956

Join West Coast Electric Fleets

We invite you to become a West Coast Electric Fleets partner by pledging to incorporate Zero Emissions Vehicles (ZEVs) into your fleet. It's easy. Start by selecting your pledge commitment. Then secure commitments from senior-level colleagues and fleet managers and announce your participation to employees and partners. Finally, share your ZEV achievements with West Coast Electric Fleets.

My organization pledges to contribute to the goal of expanding the use of ZEVs by (pick one):

ON-RAMP ☐ Evaluating ZEVs as part of all fleet procurement (including, but not requiring, piloting the use of a small number of ZEVs) AND annually revisiting this pledge to consider a higher ZEV procurement goal.

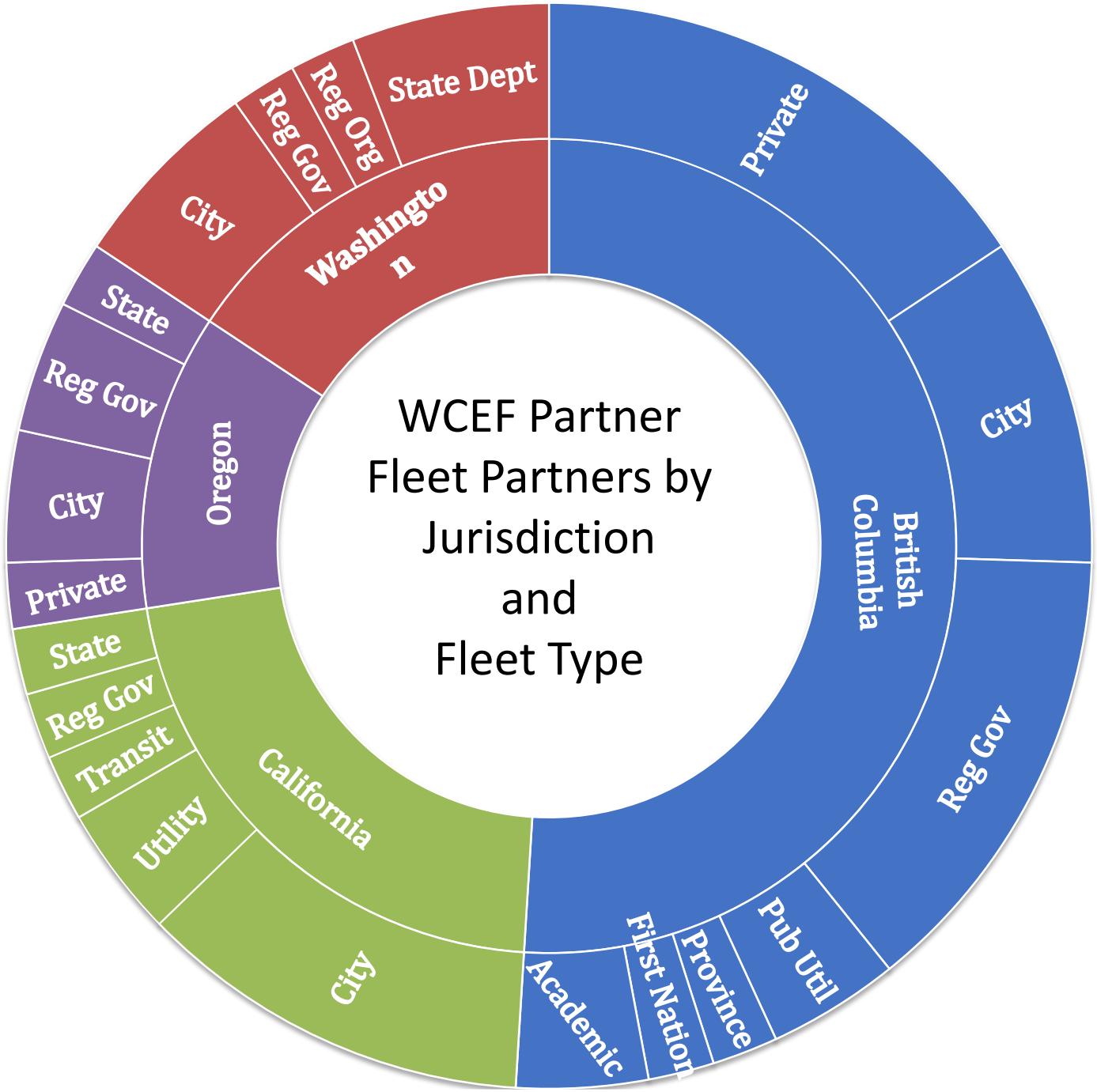
HIGHWAY ☐ Committing to at least 3% ZEVs for all new fleet procurement AND annually revisiting this pledge to consider a higher ZEV procurement goal.

EXPRESS LANE ☐ Committing to at least 10% ZEVs for all new fleet vehicle procurement AND annually revisiting this pledge to consider a higher ZEV procurement goal.

DIAMOND LANE ☐ Committing to _____ (define commitment above 10%) ZEVs for all new fleet vehicle procurement. Please indicate in the space below a year by which you plan to achieve this commitment tier.

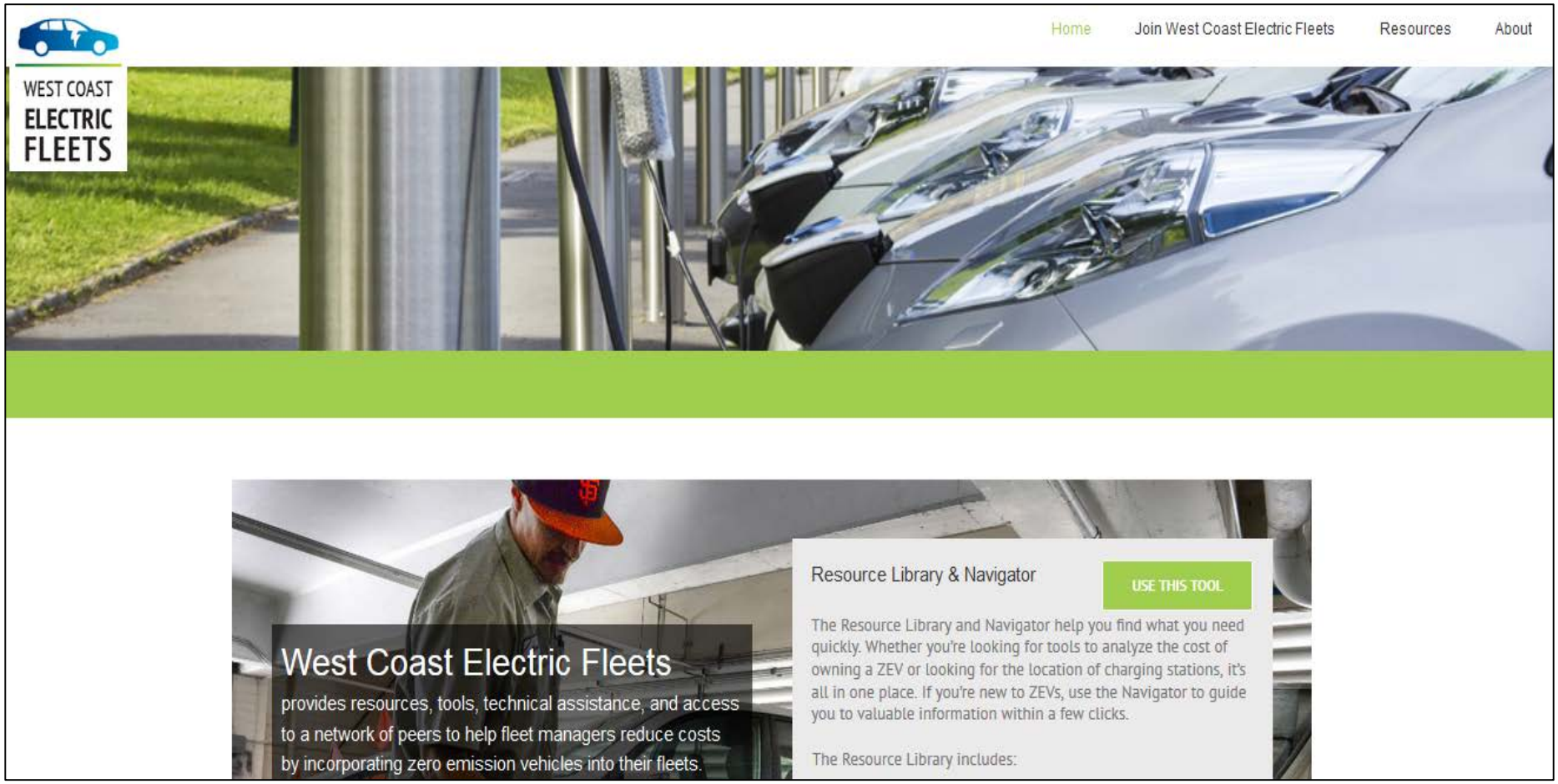
50 Partner Fleets!

Province of BC, *BC*
City of Vancouver, *BC*
District of Saanich, *BC*
BC Hydro, *BC*
City of Surrey, *BC*
Current Taxi, *BC*
Comox Valley Regional District, *BC*
Fraser Valley Regional District, BC
Gea Zone, *BC*
Onsite Equipment, *BC*
Novex Delivery Solutions, *BC*
Thompson Rivers University, *BC*
WA Dept Commerce
WA Dept Transportation
WA Dept Enterprise Svcs
City of Olympia, *WA*
City of Seattle, *WA*
King County, *WA*
Puget Sound Clean Air Agency, *WA*
State of OR Fleets
City of Portland, *OR*
Lane County, *OR*
City of Ashland, *OR*
Lane Regional Air Protection Agency, *OR*
CMTS LLC, *OR*
State of California Public Fleets, *CA*
City of Santa Ana, *CA*
LADWP, *CA*
City of San Diego, *CA*
City of San Francisco, *CA*
City of Los Angeles, *CA*
Oakland Public Works, *CA*
Pasadena Water and Power, *CA*
City of Sacramento, *CA*
Antelope Valley Trans, *CA*


WCEF Partner
Fleet Partners by
Jurisdiction
and
Fleet Type
Washington
State Dept
Reg Org
Reg Gov
City
Oregon
State
Reg Gov
City
Private
California
State
Reg Gov
Transit
Utility
City
British Columbia
Private
City
Reg Gov
Pub Util
Province
First Nation
Academic

The Toolkit

www.Westcoastelectricfleets.com



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Leadership now for a sustainable tomorrow

West Coast Electric Fleets Partner Fleet Profiles

Antelope Valley Transit A
All-In on Electric Bu

The Antelope Valley Transit Authority re
November 2014. The board that governs the
buses in the fleet will be replaced by 2018 wit
$39 million (USD) coming from Federal and S
some cost, the AVTA will need to identify add
end it is estimated to be 5-10 years before the f

The first of the new E-buses under the new ma
service beginning in 2016. With this many
infrastructure for charging requires novel appro
funding, the ATVA will install 85 hard-wire stat
also up to 11 wireless charging stations.
infrastructure in place, bus service should be
to the novel charging approach, the ATVA is al
array to power some of the chargers.

With a steep learning curve, having only recei
buses in 2014, the AVTA is approaching the
hands on deck attitude. Working collaboratively
ATVA is hoping to avoid future issues with
includes the installation of 2 x 1200V lines to
capacity currently offered.

While the AVTA only has 200 employees, the s
them to respond quickly to the mandate.

For more information on AVTA's electric fleet fo
www.avta.com/index.aspx?page=178
Visit us at: www.westcoastelectricfleets.com

City of Vancouver: EV Fleet Ma

In 2009, the City of Vancouver was one of the fi
Mitsubishi i-MiEV as part of their fleet. By 2012, the
in the city's fleet grew from 1 to 17, not including th
and scooters used by staff to get to and from me
currently has 31 EVs in the fleet with plans to have
2020. These EV's are utilized by a variety of depart
Police and Fire departments. The city has partnere
car-share co-op, to further utilize EVs and also to r
of fleet vehicles.

Modo purchased the first EV for their fleet in No
and it was subsequently available to city staff for us
the city has been in a novel partnership with Modo
fleet instead of relying on vehicles restricted to c
access to Modo's 400 cars the city has been able
number of fleet vehicles they have while saving mor

As part of this partnership, the city allows Modo
services to access City-operated charging stations.
the EVs in the city's fleet has helped to redu
emissions by 11% from 2007 levels.

The partnership between the city and Modo has
synergistic relationship, helping the city reduce t
fleet while managing the booking system for 1
including 4 EVs. The additional benefit of cha
available to the public makes this a win for everyone

For more information on Vancouver's electric fleet v
http://vancouver.ca/streets-transportation.aspx
Visit us at: www.westcoastelectricfleets.com

Fraser Valley Regional Dist
Making the Case for EVs

In 2013, the Fraser Valley Regional District planned f
installing a dual-port charging station at their Chilliw
Two years later, they put out a tender for their first
(EV) in their fleet. In order to understand the costs
an EV, the FVRD conducted a business case stud
variety of vehicles including both electric and gas cars

In understanding if EVs would meet the demands of
analyzed trip data of their fleet from October 2013 t
With data showing that 73% of all trips taken were le
the FVRD had a baseline from which to assess the bu

The business case showed that over a 7-year lifespan
the same or less than hybrids and conventional vehic
of EVs was even more pronounced when conside
lifespan because of the drastic savings in fuel an
costs. Even more impressive was that the busines
assume any potential incentives that might reduce t
presenting the case that EVs could compete on their

In July 2015 the FVRD took possession of a Nissan L
a Mitsubishi i-MiEV in September. With nearly 5
between the two EVs in the first four months, the
FVRD staff has been a success.

For more information on FVRD's electric fleet contact Rebecca
Abernethy at rabernethy@fvrd.bc.ca
Visit us at: www.westcoastelectricfleets.com

Plug in BC

GEAZONE: All Electric Deliv

In 2012, Andrew Mitchell, an eco-preneur st
electric delivery service based in Victoria, B.C
electric tricycle, Andrew quickly grew the bu
what's now 2 E-trikes, 3 Nissan Leafs, and
They have continued to double their growth
first delivery company to sign the West Coast

Since the first delivery in 2012, GeaZone
400,000kg of carbon dioxide from entering
putting over 500,000km on their fleet veh
growth in business has had its drawbacks, s
new electric trucks to add to their fleet
presenting time challenges to a small busines

With little maintenance costs other than ch
tire, GeaZone has been able to be competitiv
services that use gasoline or diesel fuel. V
existing costumers and new ones signing o
expand across Canada and inspire other flee
electric just makes sense. GeaZone sees val
financially, but also because it offers an in
carbon emissions.

For fleet managers looking to make the switc
noted that taking advantage of exist
infrastructure has been key in expanding their

For more information on GeaZone visit: www.
Visit us at: www.westcoastelectricfleets.com

City of Surrey:
Leveraging Partners In EV Adoption

The City of Surrey knows EVs are the future of transportation. This commitment was addressed through their 2008 Sustainability Charter and 2010 Corporate Emissions Action Plan. In 2011, Surrey became the first major city in Canada to host a publically accessible EVSE. They also began piloting a Nissan Leaf that same year. It would be a few more years before EVs were added to the fleet.

In making the decision to go electric, the city worked with **FleetCarma**, a division of **CrossChasm Tehnology**, to assess whether gasoline vehicles were candidates for switching to electric. With this information in hand, the city decided to remove 12 vehicles in their general fleet and replaced them with 5 Nissan Leafs. This transition was also aided by collaborating with **Modo**, a local car-share co-op. Utilizing the software and hardware that **Modo** had developed, the city was able to reduce the operational and logistical complexity with the rollout of their EVs and their ongoing management.

In the initial assessment, EV usage was critical in the return on investment (ROI). It was determined that the EVs would need to be driven 60-80km per day, and this would provide an ROI of 5-6 years. This aspect of the rollout has been a success. The city also surveyed employees who utilized the EVs and were pleased to see that 96% preferred the EVs over gasoline vehicles.

Next steps for the city include replacing more fleet vehicles with EVs, and **FleetCarma** has already identified 3 additional candidates.

For more information on the City of Surrey's electric fleet contact Burke van Drimmelen: bvandrimmelen@surrey.ca
Visit us at: www.westcoastelectricfleets.com

QUICK FACTS

Current fleet includes
- 5 Nissan Leafs

Daily use per EV
- 60km (37mi)

3 Additional EVs to be purchased in 2016

Annual Statistics per EV
- 14,400km (8,900mi) driven
- 2.76 tonnes GHGs avoided
- 3.12MWh consumed
- $250 in electricity costs

$6,000 SAVED in fuel per year

First major Canadian municipality to offer a public EVSE

Proud partners of West Coast Electric Fleets, an initiative of the Pacific Coast Collaborative.

Plug in BC

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Join Us!

Sign the Pledge!

Explore the Toolkit!

www.westcoastelectricfleets.com

Questions?
Charlotte Argue, cargue@fraserbasin.bc.ca
Ryan Davis, rdavis@fraserbasin.bc.ca

Your Neighborhood.
Your City.
Your Power.

City of Colton
ELECTRIC UTILITY

City of Colton
ELECTRIC UTILITY
Your Neighborhood Power

City of Colton Overcoming Barriers

Background

- Population – 52,000
- Size- 16 Sq. miles
- Fleet size approximately 280 vehicles
- According to the State of CA CalEnviroscreen Score 2.0 we are 90+% DAC

City of Colton
ELECTRIC UTILITY
Your Neighborhood Power

Overcoming Barriers

Background

- In fiscal year 2013/2014 the City of Colton began a GHG inventory to develop a climate action plan (adopted Nov 3, 2015). Goals were to develop a sustainability plan to grow the City in a manner with the least impacts to the environment.

City of Colton
ELECTRIC UTILITY
Your Neighborhood Power

Overcoming Barriers by Seeking Assistance

- Center for Sustainable Energy –
- Grants to have fleet evaluated-(FleetCarma)
- Applying for Fleet rebates
- Leveraging Grants
  - DOE Grants
  - MSRC Grants
  - SCAQMD Grants
  - AB2766 Subvention Funds

City of Colton
ELECTRIC UTILITY
Your Neighborhood Power

Working Together

Received Support from Utility

- Enrolled in the Low Carbon Fuel Standard
- Developed an Electric Discount Rate for Residents or Businesses who Drive EV's
- Developed a rebate for Level 2 Charging for Residents and Businesses

Contact Information:

Jessica Sutorus
Environmental Conservation Supervisor (909) 370-5561
jsutorus@coltonca.gov

Thank You

Managing EVs (and Energy) in Fleets

Phillip Kobernick,
Alameda County GSA
Transportation Services

Alameda County
SUSTAINABILITY
Local Action, Global Impact.

GSA – Motor Vehicles

- Appx. 1,100 vehicles
- 3 motor vehicle shops
- Appx. .5 million gallons of fuel for internal fleet use and 9 million VMT

The Business Case for EVs

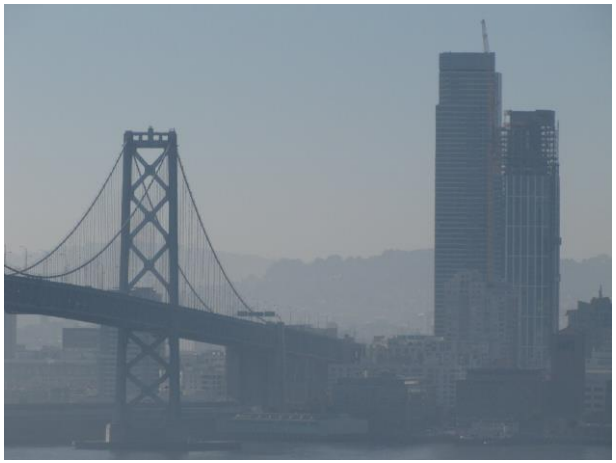
- Cost savings
- Fits duty-cycle: most “pool” trips under 40-50 miles
- Average EV trip is 30 miles
- Reduced PM maintenance through regen brakes and no oil
- HOV-lane access
- Fun to drive!

*** Estimate**

Vehicle	Fuel Cost	Avg. MPG	Cost per Mile	Cost/8000 miles
Compact	$4.50	27	$0.16	$1,280
Intermediate	$4.50	21	$0.21	$1,680
Full Size	$4.50	12	$0.37	$2,960
Hybrid	$4.50	45	$0.10	$800
EV-Peak*	$0.15 per kWh	100 miles per charge	$0.036	$288
EV-Off Peak*	$0.08 per kWh	100 miles per charge	$0.019	$152

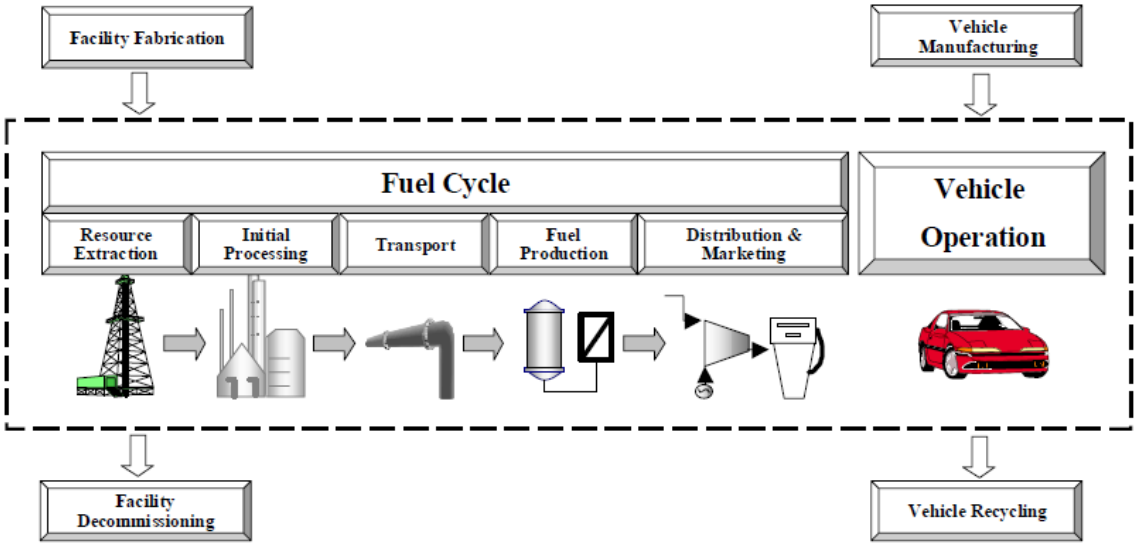
The Environmental Case for EVs

- "Criteria" emissions
  - Particulate Matter
  - Ozone
  - Nitrogen Oxide
  - Carbon Monoxide



- GHG "Wheel to Wheels Analysis" – 20 pounds of CO2 emissions per gallon

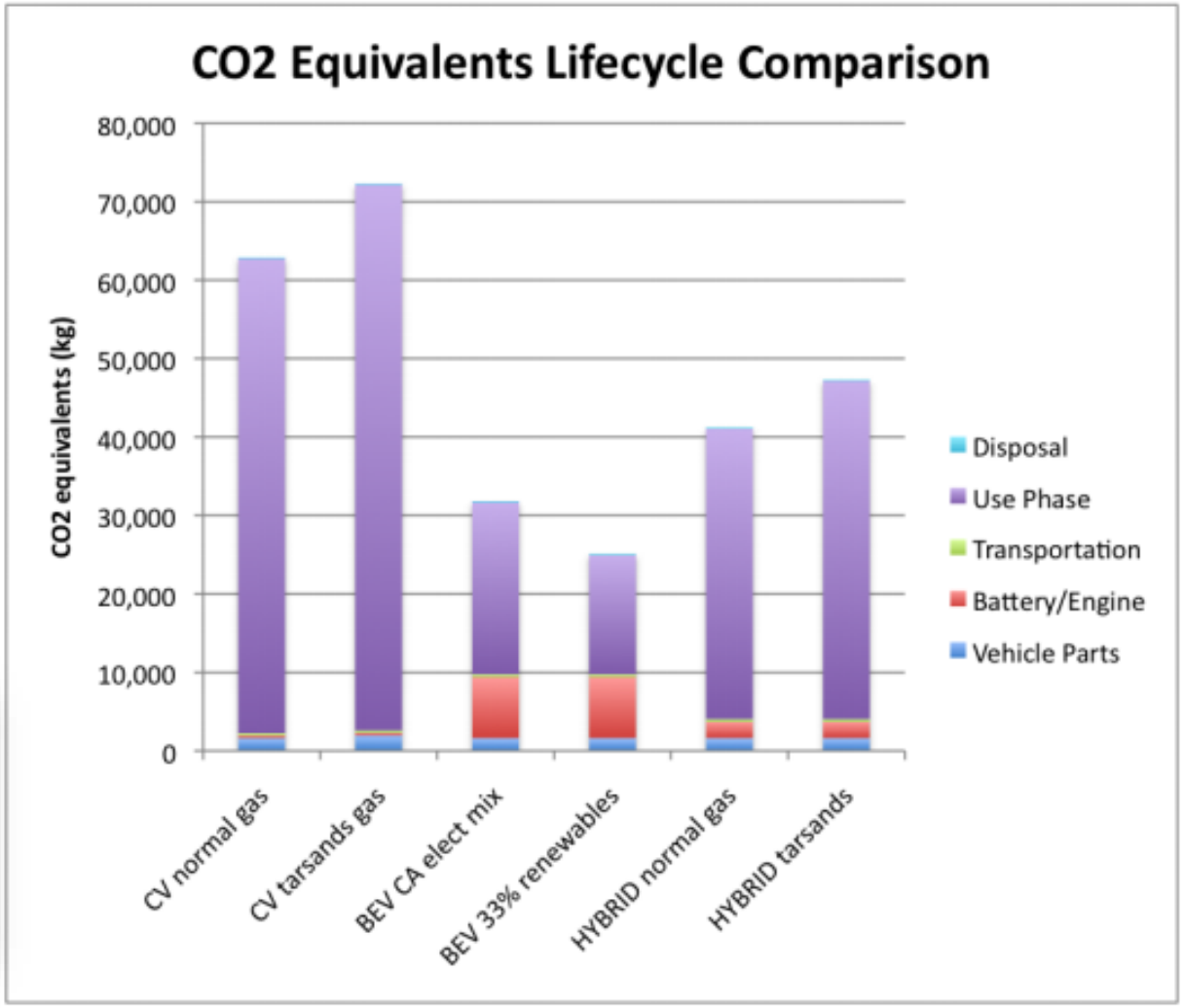
Figure 2-1. Total Vehicle Energy Cycle



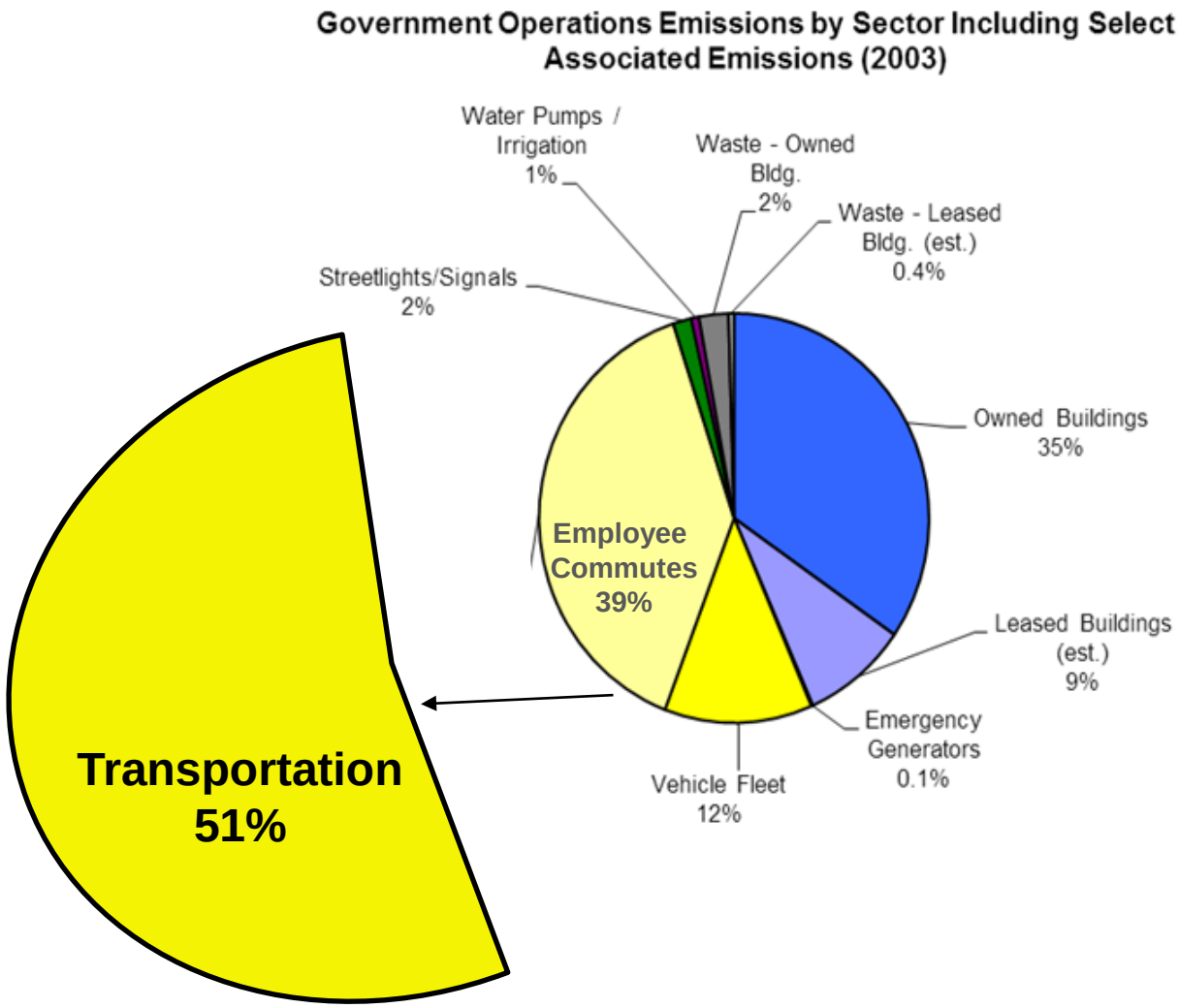
The Environmental Case for EVs

- Eliminate tailpipe emissions
- Significantly lower lifecycle GHG emissions
- “Greener” over time through CA RPS…
- Or local solar

Figure 10. CO2 Equivalents Lifecycle Comparison



Countywide Emissions



The External Case for EVs

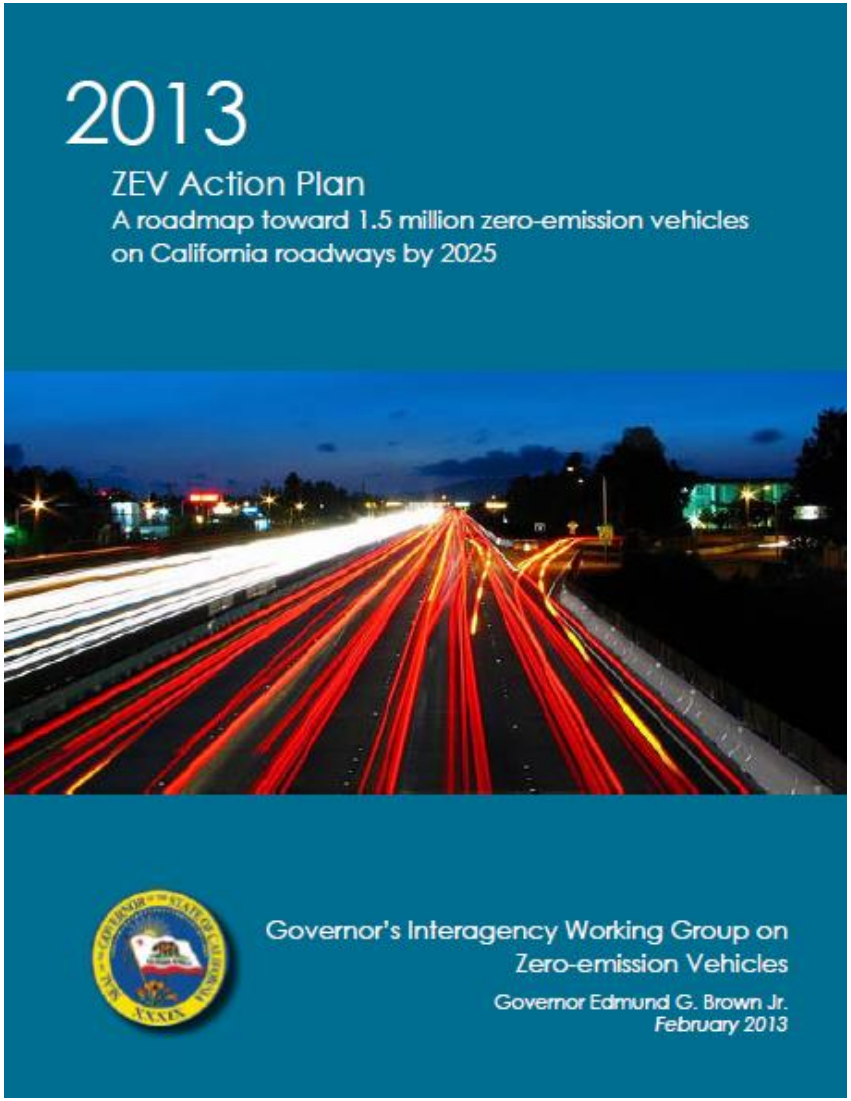
BAAQMD Clean Air Plan

- 10,000 BEVs
- 100,000 PHEVs
- 2,000 new EVCS

in Bay Area by 2020

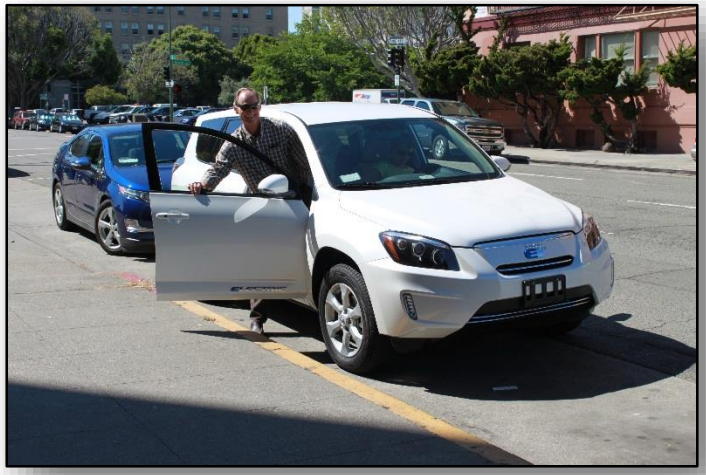
Gov. Brown California ZEV Action Plan

- 1.5 million ZEVs on CA roads by 2025



EVs at Alameda County

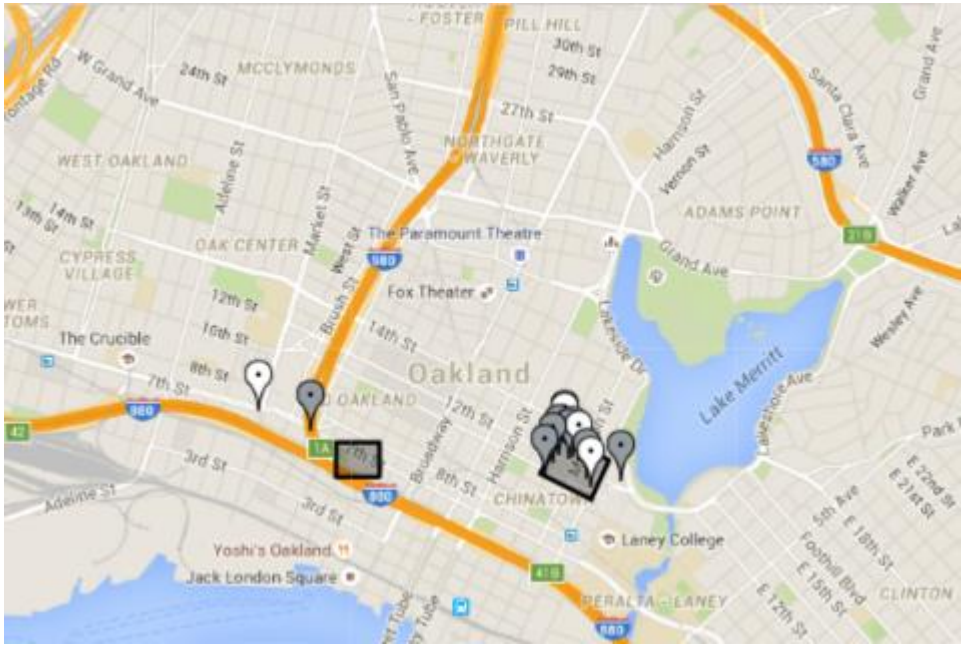
- ~60 EVs
- 66 charge ports (mixed public and fleet)
- 7 dual-port L2 (public and fleet) and a DC Fast Charger this winter



EVCS Cost Breakdown

- Public/Fleet Stations (Level 2)
  - $3,500 -$6,000 per station
  - ~$9,500-$11,000/station for installation
  - $13,000 - $17,000 total
  - Dual ports cut cost
- Public Level 3 Station
  - ~$46,000 per station
  - ~$30,000 for installation
- Fleet Only Stations (Level 2)
  - Ask ChargePoint

Managing EVs (and Energy) with Telematics



fleetcarma

EV Telematics

Month-To-Month Summary

Tools | Search...

	Mar-2016	Apr-2016	May-2016
Number Of Vehicles	20	20	19
Charger Energy			
Average End SOC (%)	61.5	61	58.3
Benchmark - Average End SOC (%)		41.3	
Average Start SOC (%)	85.9	84	83.2
Quick Charge (kWh)	0	3.6	0
Standard Charge (kWh)	2397.1	2073.4	2120.1
Distance			
Daily Distance For Fleet (mi)	22.3	20.6	23.2
Benchmark - Daily Distance For Fleet (mi)		21.3	
Total Distance (mi)	7748.5	6751.2	6948
Total Distance per Vehicle (mi)	387.4	337.6	365.7

EV Telematics

Choose Vehicle

Search

- 14003207, (2015 Nissan Leaf)
- **14003208, (2015 Nissan Leaf)**
- 14003209, (2015 Nissan Leaf)
- 14003210, (2015 Nissan Leaf)
- 14003211, (2015 Nissan Leaf)
- 14003255, (2015 Nissan Leaf)

Vehicle Overview

14003208
2015 Nissan Leaf
1375922
1N4AZ0CP2FC301594
F4887C

137 kWh	222 Wh/mi	95 Percent	63 Percent
Total Charging	Electricity Consumption	Average Starting SOC	Average Ending SOC

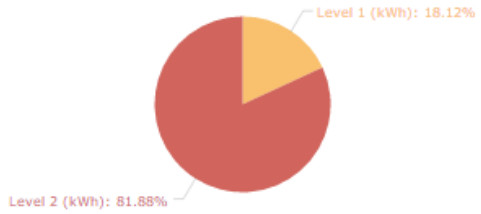
Charging by Geofence

Tools | Search...

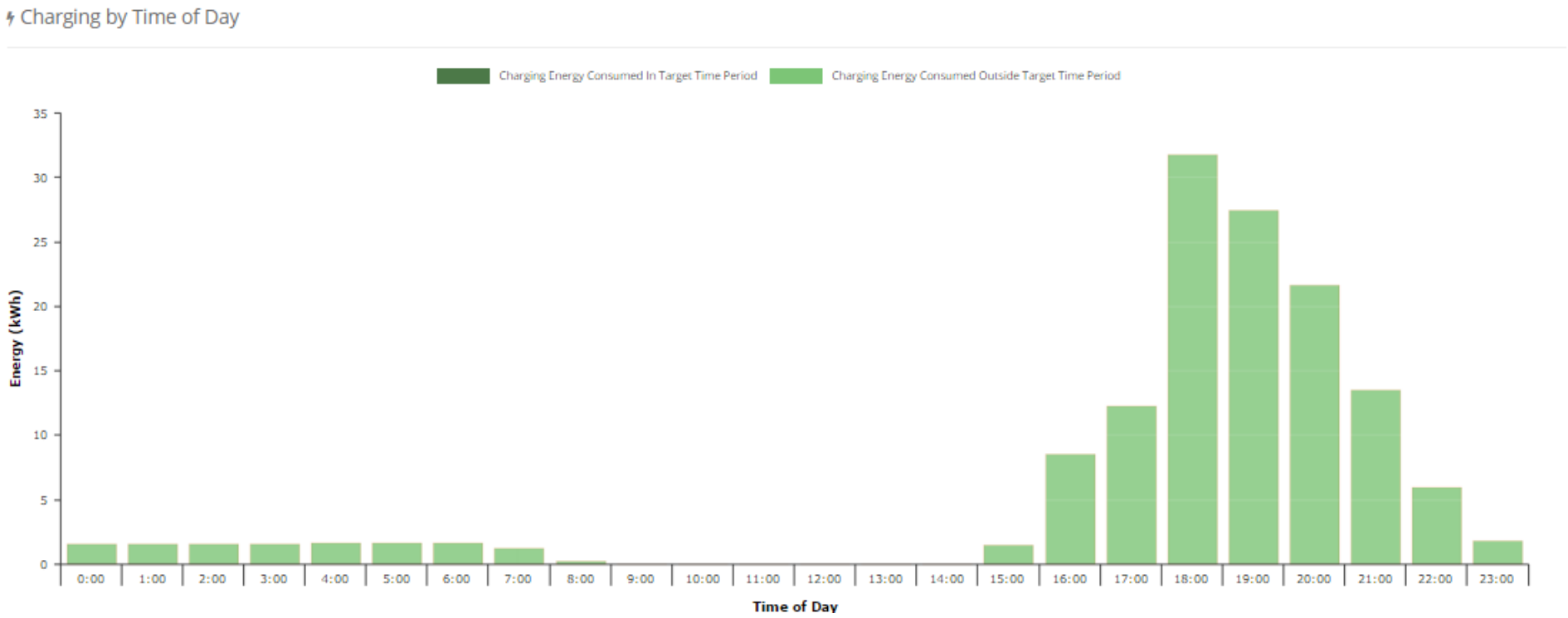
Geofence	Charging (kWh)
AlcoPark	97
Other Charging	22
7th and Jefferson	0
Amador Garage	0

Showing 1 to 4 of 4 entries Show 1

Charging by Level

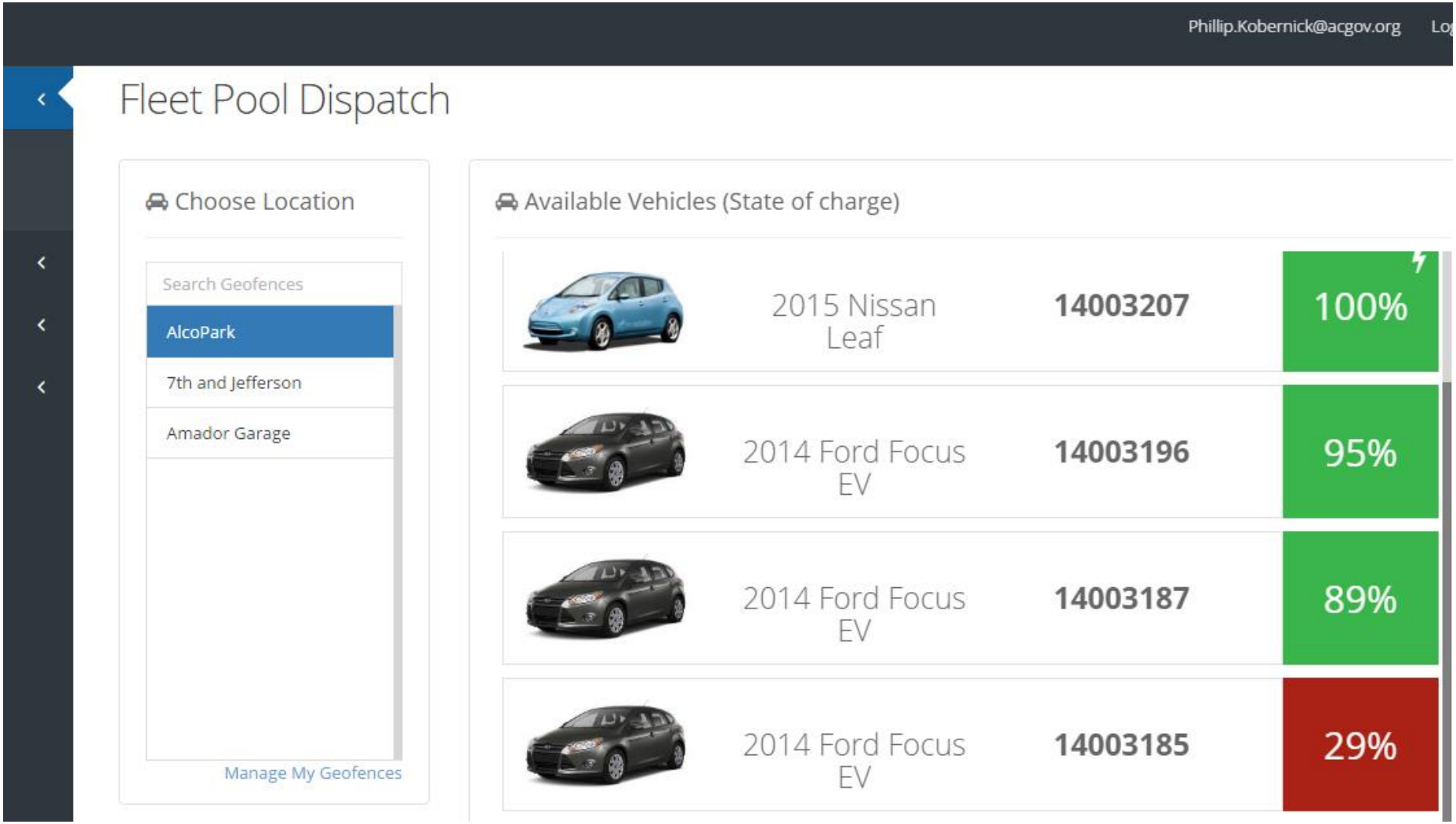


EV Telematics



EV Telematics

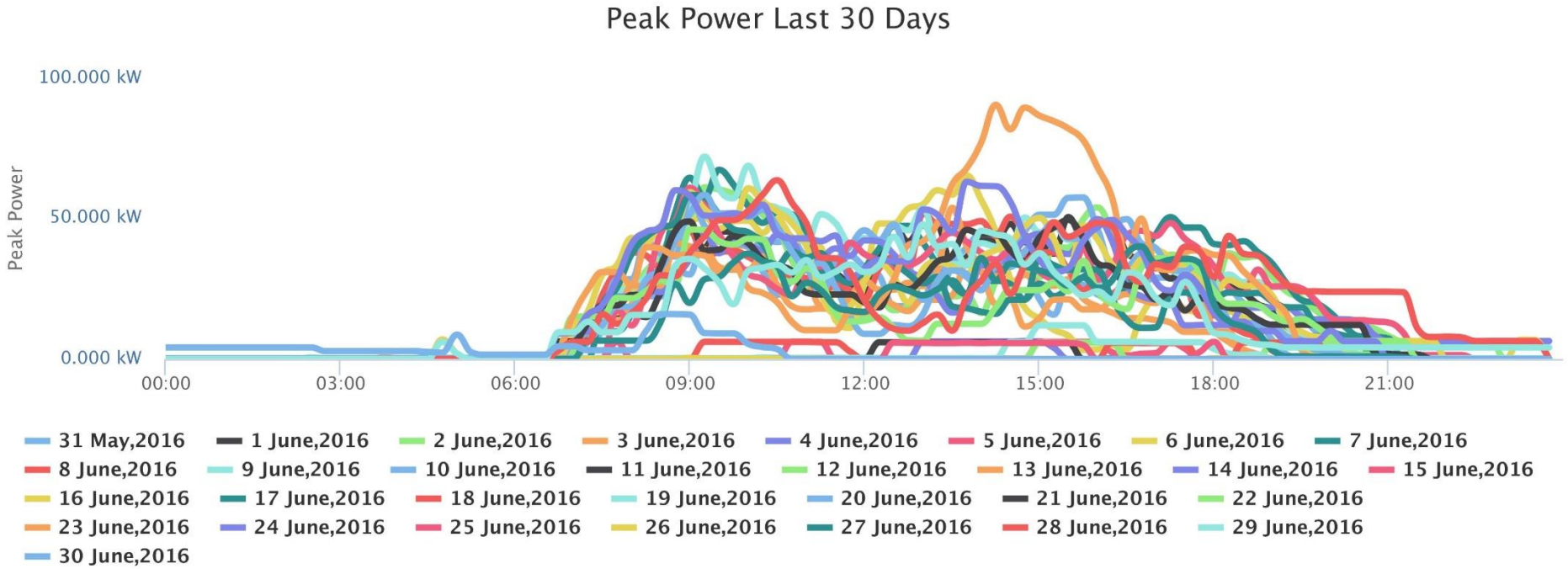
EV Telematics



EV Telematics

Remaining Challenges

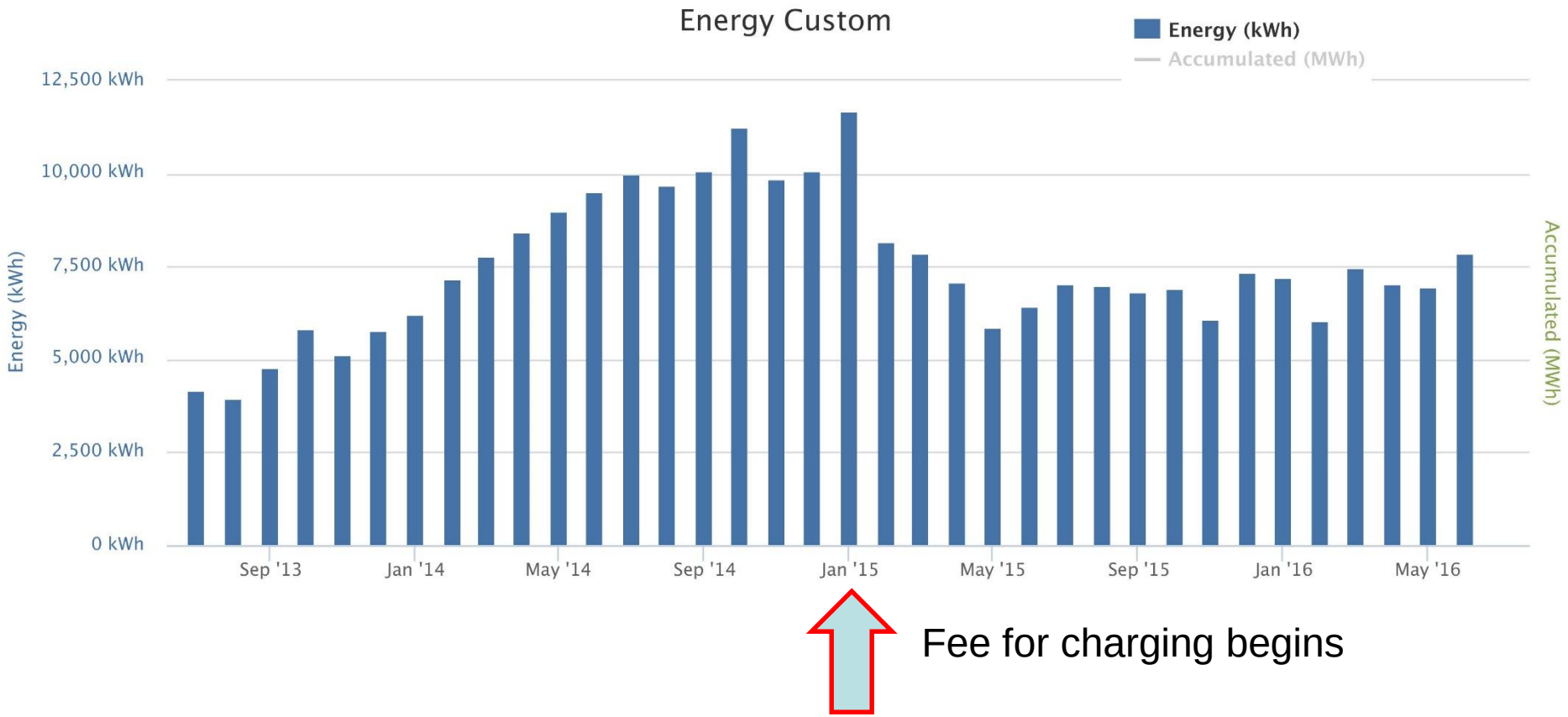
- Accurate cost/mile based on charging location and time of day
- Macro view of charge times for fleet & controls



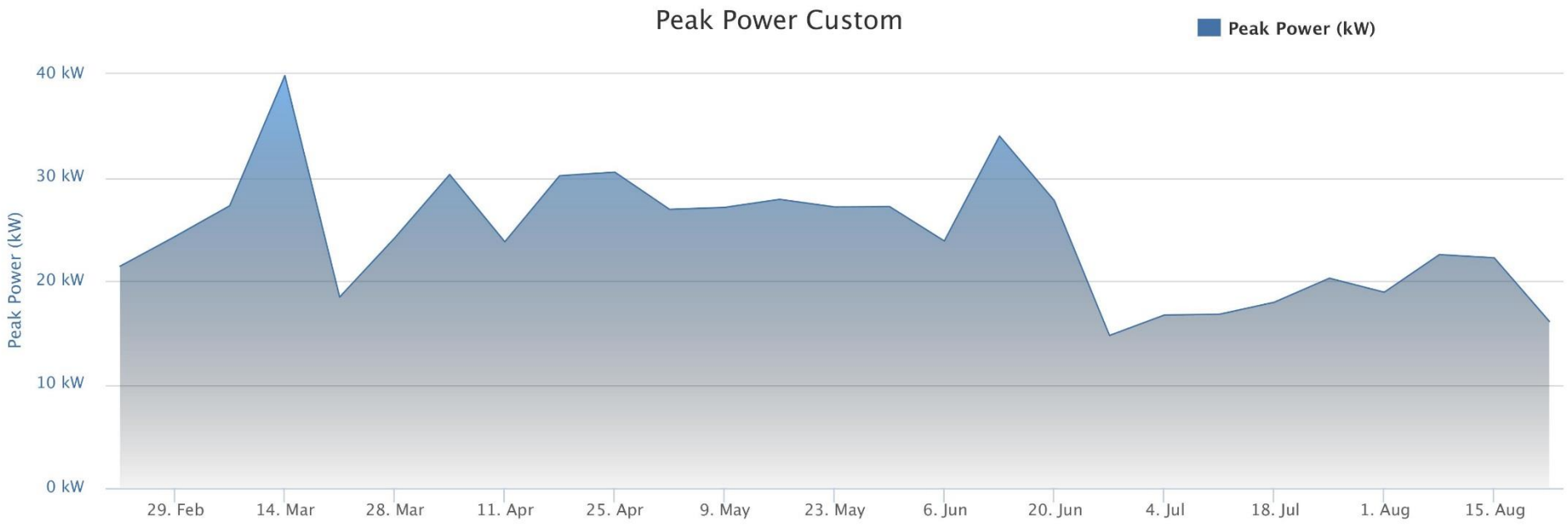
Next Steps – Manage Energy

Charge $ for EV Charging

$1 activation + $.20/kWh



Mix of L2 and L1 Charging



Power shed begins

"Shed" half of L2 EVCS at main garage to L1 levels for drivers who are parked all day.

Battery Storage

Q & A

Phillip Kobernick
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