Transforming Transportation for Electric Vehicles

Planning for electric vehicles in the Tahoe-Truckee Region

Advisory Planning Commission - July 12, 2017

Outline

- Why Plan for electric vehicles?
- Current Conditions Results
- Readiness Plan & Addressing Challenges
- Toolkits, Action Plan, Performance Metrics & Next Steps

Feb. – August. 2016: Existing Conditions Assessment and Survey

Sept. – Jan. 2016: Toolkits and Drafted Readiness Plan

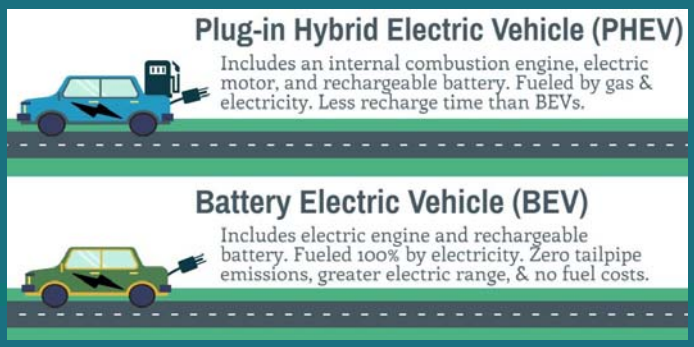
Feb. to Spring 2017: Finalized Plan and Toolkits, Develop Website

Spring 2017: Education Material Development & Events

Summer 2017 & on: Projects, Implementation of Plan, Outreach

- **Convened Coordinating Council four times from 2016 to 2017.**

EV Technology



PHEV Example, Chevy Volt

BEV Example, Tesla

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Overview of Chargers

Level 1 AC Charger, home charging

Level 2 AC Charger, home and business charging

CHAdeMO Direct Current (DC) Fast Chargers

Type	Current	Voltage	Average Charging Time to Full	
			PHEV	BEV
Level 1	AC	120 V, 15-20 A	3-7 h	14+ h
Level 2	AC	240 V, > 80 A	1-3 h	5-7 h
DC Fast Charger	DC	480 V, >120 A	< 30 m	< 1 h

Source: ICF. Resource on buying home charger: http://www.plugincars.com/quick-guide-buying-your-first-home-ev-charger-126875.html

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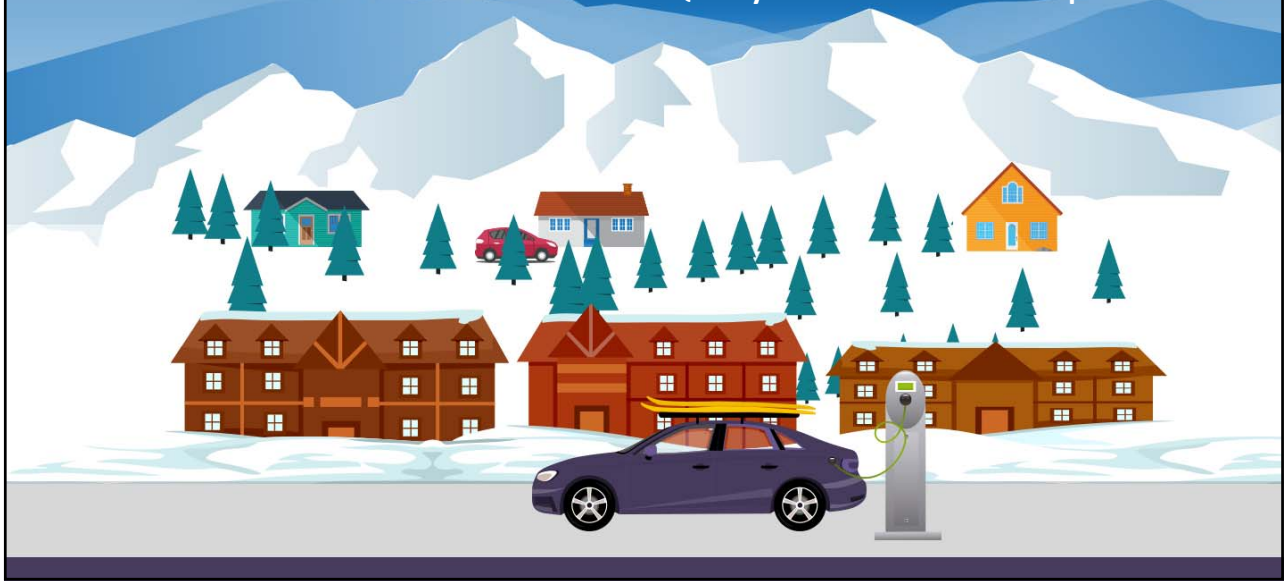
PROTECTING THE ENVIRONMENT

When you drive a EV you are protecting your local and global environment

Environmental Benefits: Air and Water Quality and Reduced Noise Impacts



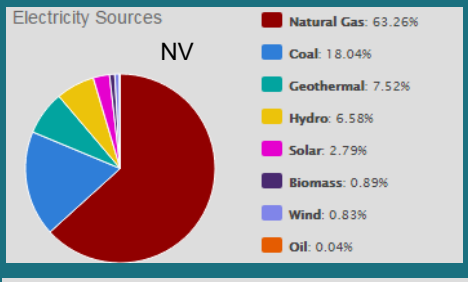
GHG Emissions Reduction

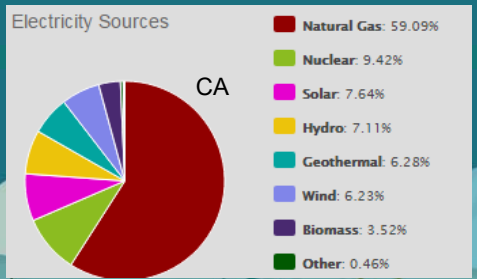
TAHOE REGIONAL PLANNING AGENCY

GHG Sources in Tahoe: 23% Transportation

All-electric = zero tailpipe emissions plus emissions from electricity

- **Difference between all electric & Gas Vehicles: 70% reduction**
- **Reduction difference between Plug-in Hybrid Electric & Gas Vehicles: 30% reduction**





Renewable Energy Targets

- NV: 25% renewable by 2025
- CA: 50% renewable by 2030

Sources: ICF calculations based on local utility company estimates and pie charts are from US Department of Energy Alternative Fuels Data Center, www.afdc.energy.gov/vehicles/electric_emissions.php

Why Plan for EV Readiness?

- Areas w/ EV planning had **90%** greater utilization compared to ad hoc uncoordinated planning
- ↓ Range anxiety
- Regional momentum

All-inclusive charge point in Gilroy, CA; photos of wayfinding

ICCT White Paper: Assessment of leading electric vehicle promotion activities in United States cities and 2) Idaho National Labs Paper: How Does Utilization of Non-Residential EVSE Compare Between those Installed in Oregon in Planned versus Unplanned Locations?

Who is Involved?

- CA Energy Commission Grant
- Team: TRPA, Truckee-Donner PUD, and consultants (ICF)
- Tahoe-Truckee Council
- Stakeholders, Public

Purpose of Plan

Transportation Vision: Encourage travel by bus, bike, foot, or PEVs over conventional vehicles

Lays out the path to make the Tahoe-Truckee Region "PEV ready"

- Snapshot of current conditions
- Identify barriers to increase EV use & improve access to chargers

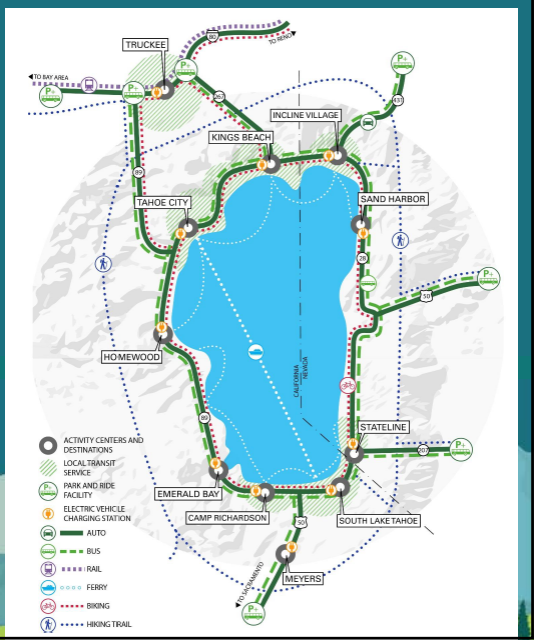
Develop partnerships & identify actions to unlock the long-term potential of transportation electrification as a sustainability initiative

Readiness Plan

- Forecasted growth
- Policies, incentives, and funding
- Barriers
- Charging infrastructure siting analysis
- Goals and actions
- Performance measurement

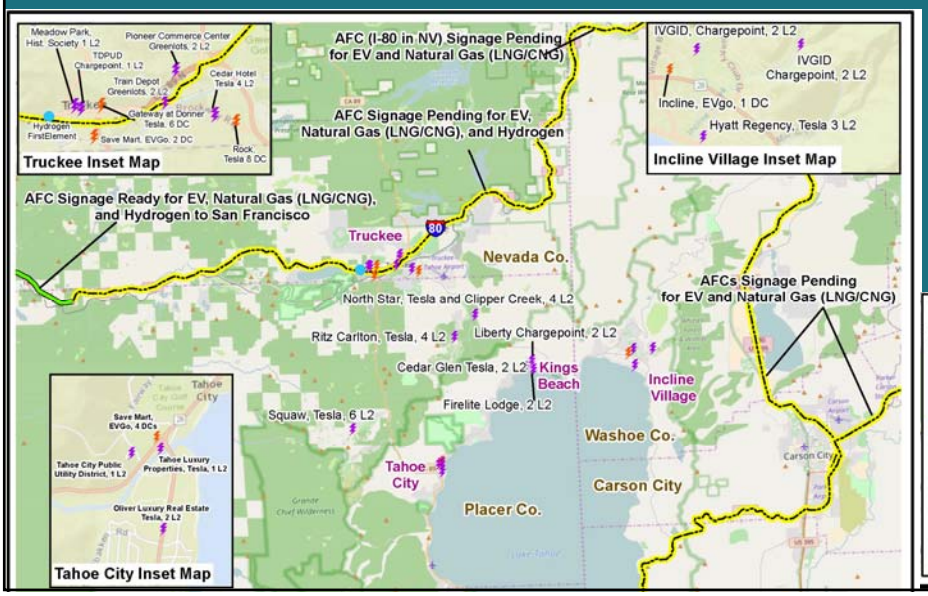
Electrification Goals & Vision

1. **Maximize the share of electric miles over conventional vehicles**
2. Make it **easier & less expensive to install chargers &** make them broadly accessible
3. **Improve electric vehicle awareness**



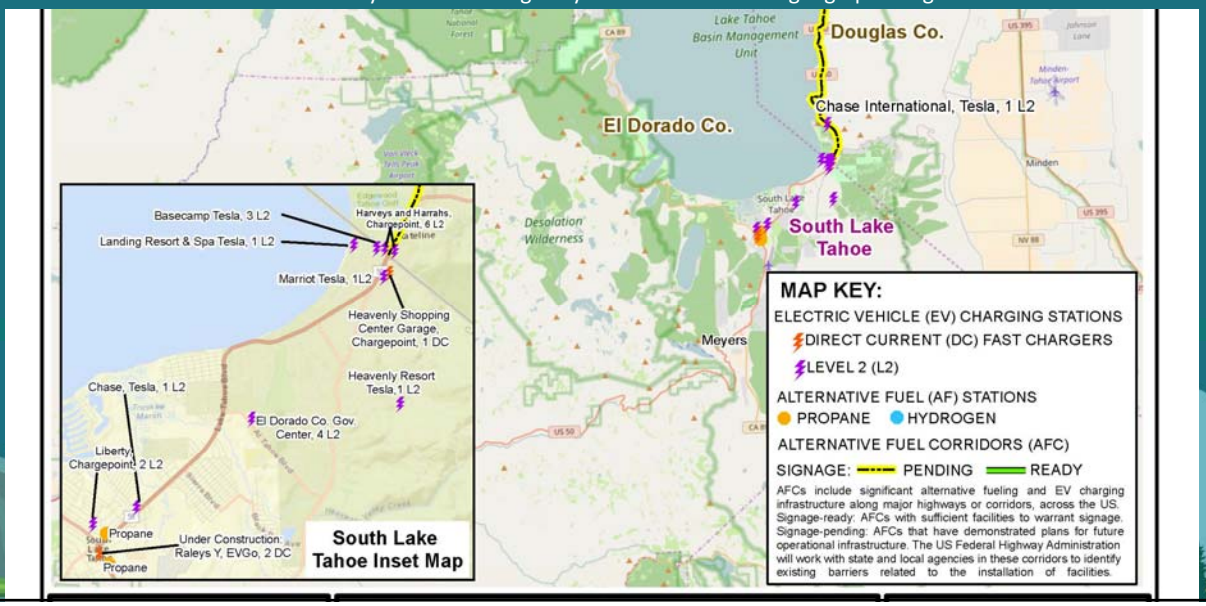
Regional Chargers

32 charging locations | 80 charging plugs | 17 DC fast chargers (16 in Truckee, 1 in SLT)



Regional Chargers

Both I-80 and US 50 were selected by the Federal Highways Administration as signage-pending Alternative Fuels Corridors



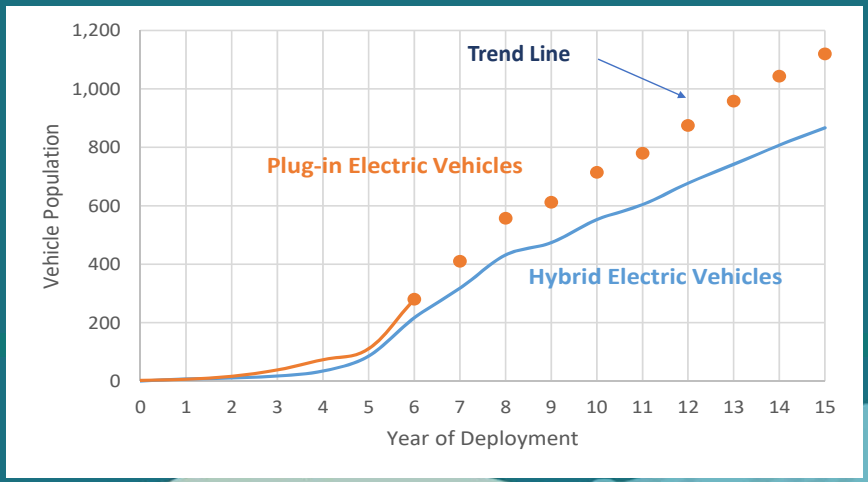
Electric Vehicle Growth

PEV adoption rate higher than hybrid adoption at time of technology deployment in the mid-2000s.

PEV Ownership, 2016:

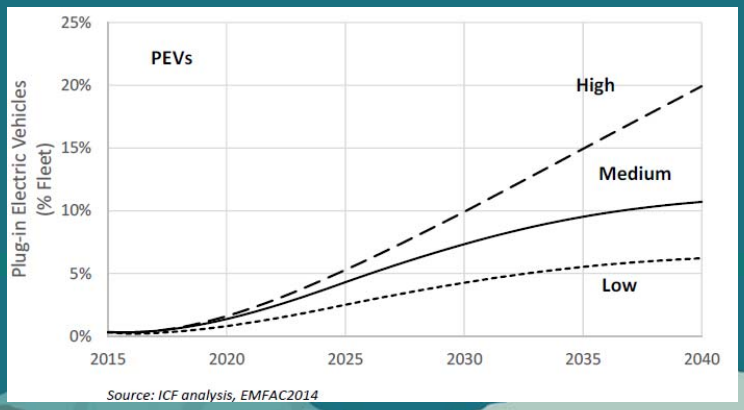
- 115 PEVs registered by area residents
- 45% Tesla

ICF analyzed vehicle registration data provided by IHS Automotive, March 2016.



PEV Growth Scenarios

Medium Scenario: 3-6% EV trips by 2025 & 6.5-13% by 2040



Source: ICF analysis, EMFAC2014

California 2025 goals:
15% of light duty sales must be Zero Emission Vehicles

TAHOE-TRUCKEE KEY FINDINGS
Vehicle Ownership Survey

SUMMARY

OPPORTUNITIES
- Strong interest for EVs
- Optimistic outlook
- Ideal commuting patterns for EVs

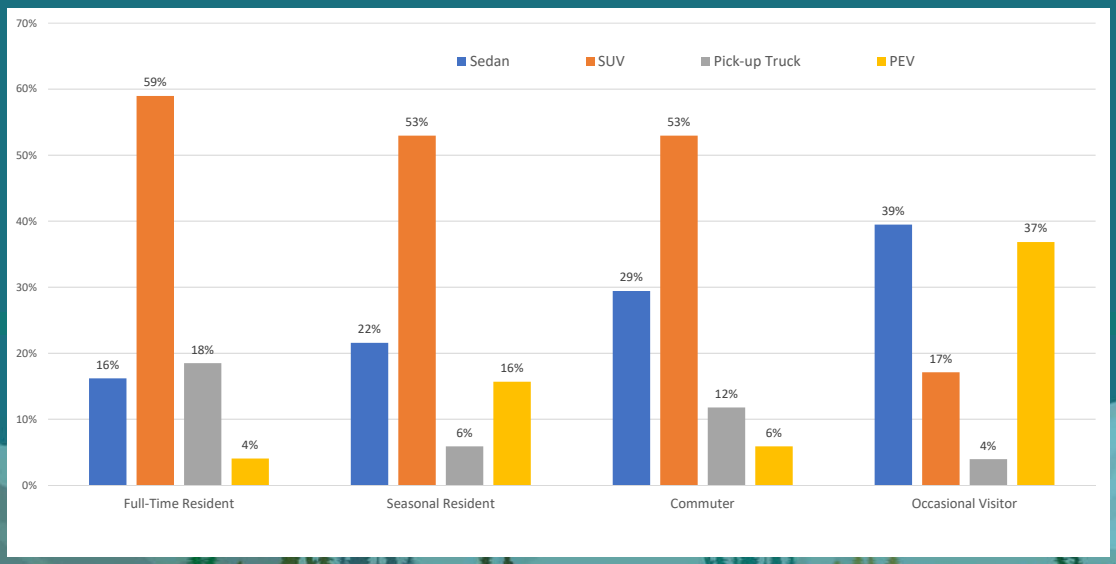
CHALLENGES
- Top rated brands have limited EV offerings
- Not that familiar with incentives available
- Preferred vehicle attributes

WHAT WE HEARD
- 44% will consider buying an EV for their next car
- Majority of respondents think sales of EVs will continue to increase
- 56% of respondents drive less than 20 mi/day
- Top-rated brands are Toyota, Honda, Subaru
- Over 50% were not familiar with incentives
- Limited all-wheel drive and limited cargo/trunk space for most EVs

TAKE-AWAYS
Consumer Awareness can help Foster Market Growth
EV Offerings are Expanding Rapidly

Vehicle Ownership Survey, June-July 2016, 424 Respondents

Current Vehicle Ownership Trends



Vehicle Option Cost Comparison

	Vehicle Make & Model	Electric Range	Estimated Cost (Base)	Other Costs
BEV	Tesla Model S, X, and 3 *(2017)*	200-270 miles	Model S - $70,000 Model X - $80,000 Model 3 - $35,000	Home charger costs $600 to $3,000 (not including rebate)
BEV	Chevrolet Bolt (*2017*)	200 miles	Chevrolet Bolt, $38,000	
BEV	Nissan Leaf, Kia Soul, Mercedes Benz B-Class, Fiat 500e	84-107 miles	2016 Nissan Leaf - $29,860 2016 Kia Soul EV - $31,950 2016 Mercedes-Benz B250e - $42,375 2016 Fiat 500e - $31,800	
BEV	BMW i3, Chevy Spark, VW eGolf, Ford Focus, Honda Fit, Mitsubishi iMiev	62-83 miles	2016 Chevy Spark - $25,995 2016 Volkswagen e-Golf - $29,815 **2016 Mitsubishi i-MiEV - $23,845**	
PHEV	Chevy Volt	53 miles	2016 Chevrolet Volt - $33,995	Fuel costs if go over electric range, home charger costs same as above
PHEV	Cadillac ELR, Audi A3e, Hyundai Sonata	27-37 miles	2016 Cadillac ELR - $65,000 2016 Audi A3 Sportback e-tron - $37,900 2016 Hyundai Sonata - $35,435	
PHEV	Honda Accord, BMW X5, Porsche, Volvo	13-17 miles	**2016 Porsche Panamera S - $94,250** 2016 Volvo XC90 T8 - $69,095	
PHEV	Ford C-Max Energi, Fusion, Mercedes C350	20 miles	2015 Ford C-MAX Energi - $32,645 2016 Ford Fusion Energi SE- $34,775	
PHEV	Toyota Prius Plug-in Hybrid	11-14 miles	Toyota Prius PHEV- $30,800	

This information is an estimate and meant to provide a snapshot of the growing diversity of PEV options. It might not provide the most up-to-date info. *Sources: ICF, www.greencarreports.com/news/1080871_electric-car-price-guide-every-2015-2016-plug-in-car-with-specs-updated and www.plugincars.com/quick-guide-buying-your-first-home-ev-charger-126875.html*

Robust Public Outreach & Education

Over half of the respondents did not know about incentives.

Online Resources & Email List Updates

Events

Materials

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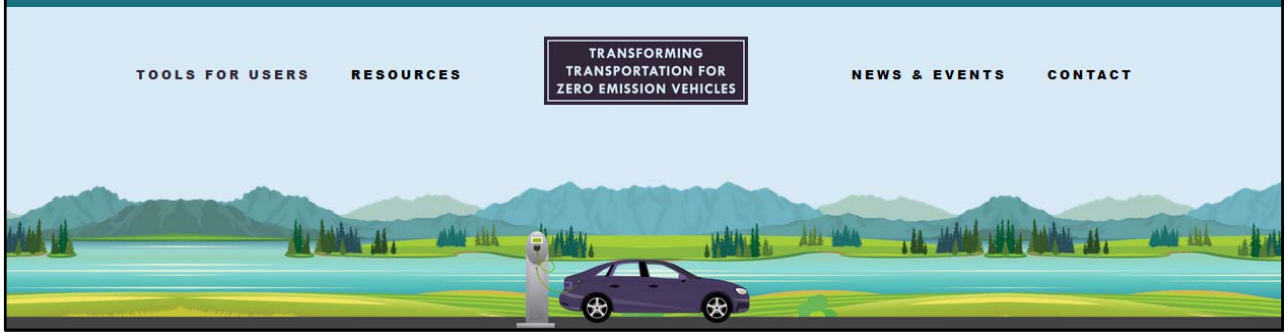
www.tahoealternativefuels.com

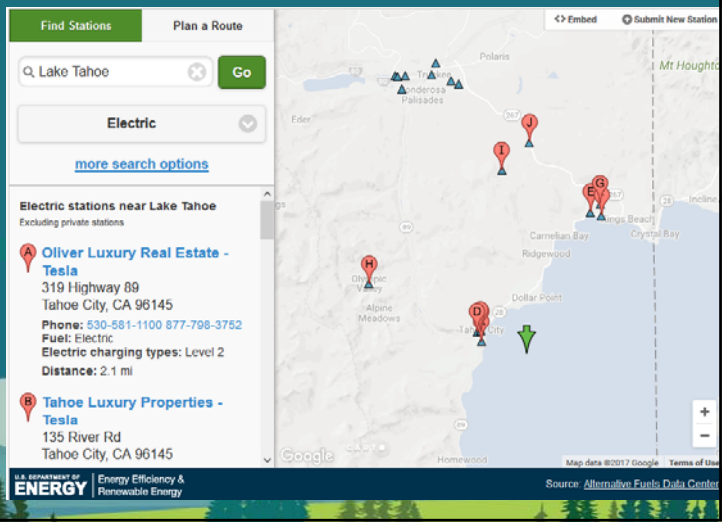


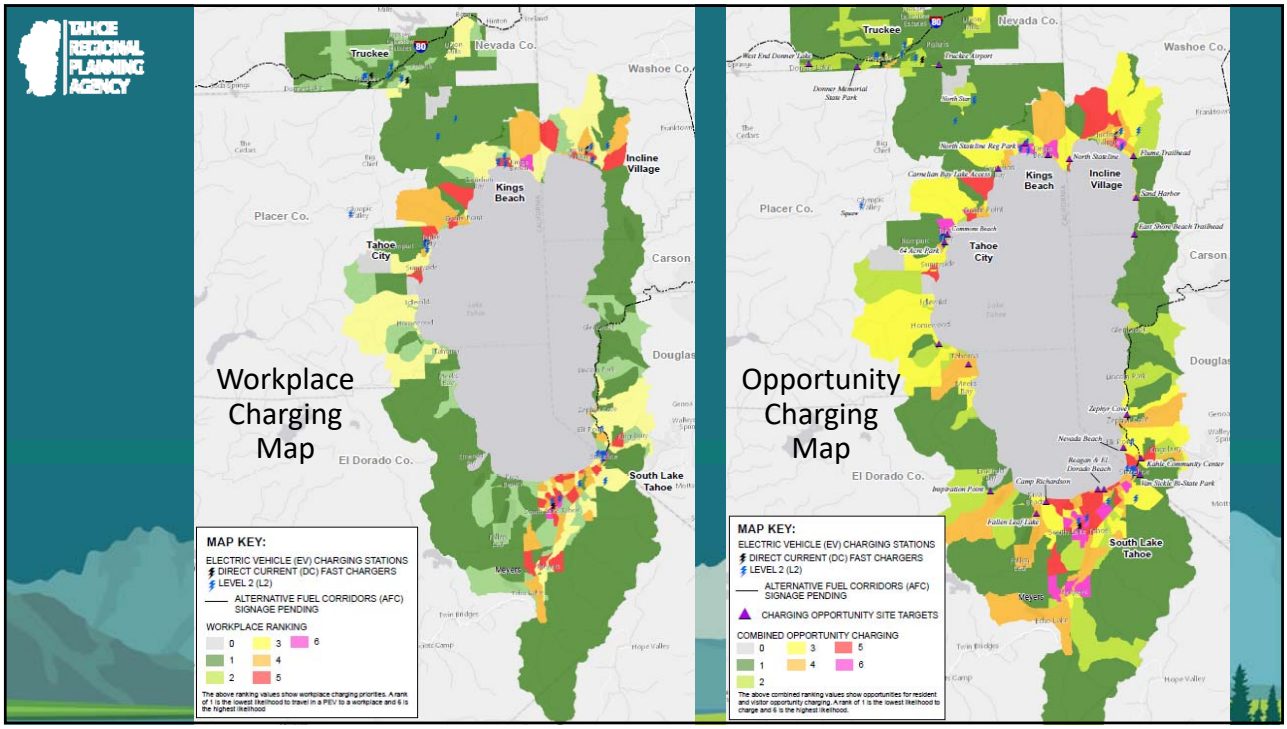
Charging Infrastructure Siting Analysis

Where is the demand for electric vehicles?

Factors:

- Income
- Hybrid vehicle ownership rates
- Home ownership
- Dwelling type
- Regional travel patterns





Plan Implementation

On-Going Activities

- Monitor PEV and charging infrastructure deployment and local government PEV readiness
- Create cross-jurisdictional opportunities for sharing lessons learned
- Identify PEV related grant funding opportunities and coordinate charging infrastructure deployment,including corridor network of DC fast chargers and L1/L2 workplace charging

Short-Term (1-2 years)

Consumer Education & Outreach
- Develop PEV resources website

Incentives
- Develop a PEV purchasing incentive program
- Establish PEV electricity rates

Permitting & Inspection
- Streamline and expedite permitting process

Local Ordinances & Planning
- Develop charging station guidelines
- Adopt the Voluntary CalGreen codes

Training & Education
- Provide resources to employers and fleet managers

Utility Planning
- Create utility notification protocol

Regional Coordination
- Integrate PEV readiness into local planning efforts

Medium-Term (3-5 years)

Consumer Education & Outreach
- Implement utility consumer outreach program

Incentives
- Develop charging station rebate program

Permitting & Inspection
- Train permitting and inspection staff
- Reduce permitting fees for non-residential charging stations

Local Ordinances & Planning
- Develop PEV parking enforcement policies
- Adopt regulation for preferential parking for PEVs

Training & Education
- Provide technical assistance and training to fleet managers

Utility Planning
- Evaluate impact of rate structures on PEV drivers
- Upgrade distribution infrastructure and evaluate needs

Regional Coordination
- Create a utility notification protocol through permitting process
- Update EV infrastructure siting plan

Long-Term (6-10 years)

Local Ordinances & Planning
- Allow PEV parking to count towards minimum requirements

Utility Planning
- Evaluate smart grid opportunities
- Provide renewable

Regional Coordination
- Adopt plans that encourage the deployment of PEVs and charging infrastructure

Performance Metrics

Goal 1. Maximize the number of electric miles traveled

Ex: Avoided GHG and criteria air pollutant emissions

Goal 2. Make it easier and less expensive to install electric vehicle charging infrastructure

Ex: Time to permit and install infrastructure

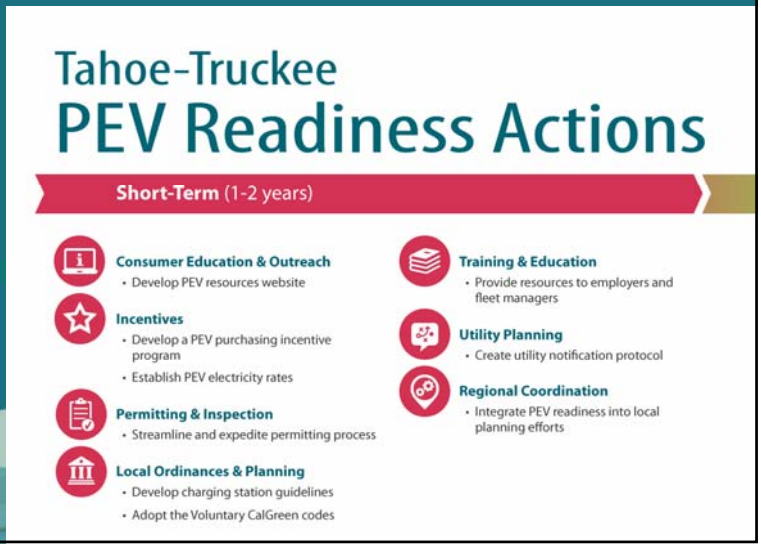
Goal 3. Improve electric vehicle awareness

Ex: Public awareness of the benefits of electric vehicles

Implementation

California Energy Commission Grant (Round 2):

- Ombudsman
- Outreach and Education
- Site Specific Analysis
- Permit Streamlining



Implementation

Infrastructure Funding and Financing:

- Liberty Utilities
- Tahoe Fund
- California Energy Commission
- Private charging networks
- Other funding opportunities

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Implementation

Sector Specific Toolkits

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Local Government Toolkit Highlights
RESIDENTS & VISITORS
CHARGING DESTINATIONS
LOCAL GOVERNMENT
FLEET MANAGERS
UTILITIES


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Charging Destination Toolkit Highlights
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FLEET MANAGERS
UTILITIES

Thank you

- California Energy Commission
- Tahoe-Truckee PEV Coordinating Council
- Steven Poncelet, Truckee Donner Public Utility District

- ICF Team: Philip Sheehy, Louise Huttinger, Rob Brueck, Ben Eckold, Stephanie Bogue

Questions? Comments?

Devin Middlebrook
Tahoe Regional Planning Agency
dmiddlebrook@trpa.org
775-589-5230

Jennifer Cannon
Tahoe Regional Planning Agency
jcannon@trpa.org
775-589-5297

www.tahoealternativefuels.com