



# PLUG IN! EV CHARGER BASICS



MONDAY, SEPTEMBER 25, 2023

# OVERVIEW

- Clean Cities Introduction
- Presentations
- Q&A



Raheel Sadiq  
NV Energy



Sarah Booth  
Sawatch Labs



Marco N. Velotta  
City of Las Vegas



Leslie L. Mujica  
Las Vegas Power Professionals

- National network through the US Department of Energy
- Goal:
  - Reduce petroleum fuels
    - Approved alternative fuels
    - Idling reduction
- Purpose:
  - Reduce dependence on foreign oil
  - Provide cleaner air
  - Lower greenhouse gas emissions
- 75 Coalitions in the United States
  - ...but (UNTIL RECENTLY!) no representation in Nevada
- Clark County is currently working towards a designation- and has earned an apprentice designation into the Clean Cities network!



# HOW TO PARTICIPATE?

Quarterly Stakeholder Meetings

Online Programming

In-Person Events

Join a Working Group

Opportunities to support, present & host





## WANT TO LEARN MORE?

Visit our website by scanning this QR code

Email [Nicole.Wargo@ClarkCountyNV.gov](mailto:Nicole.Wargo@ClarkCountyNV.gov)





# NV Energy Electrification

Raheel Sadiq, MBA

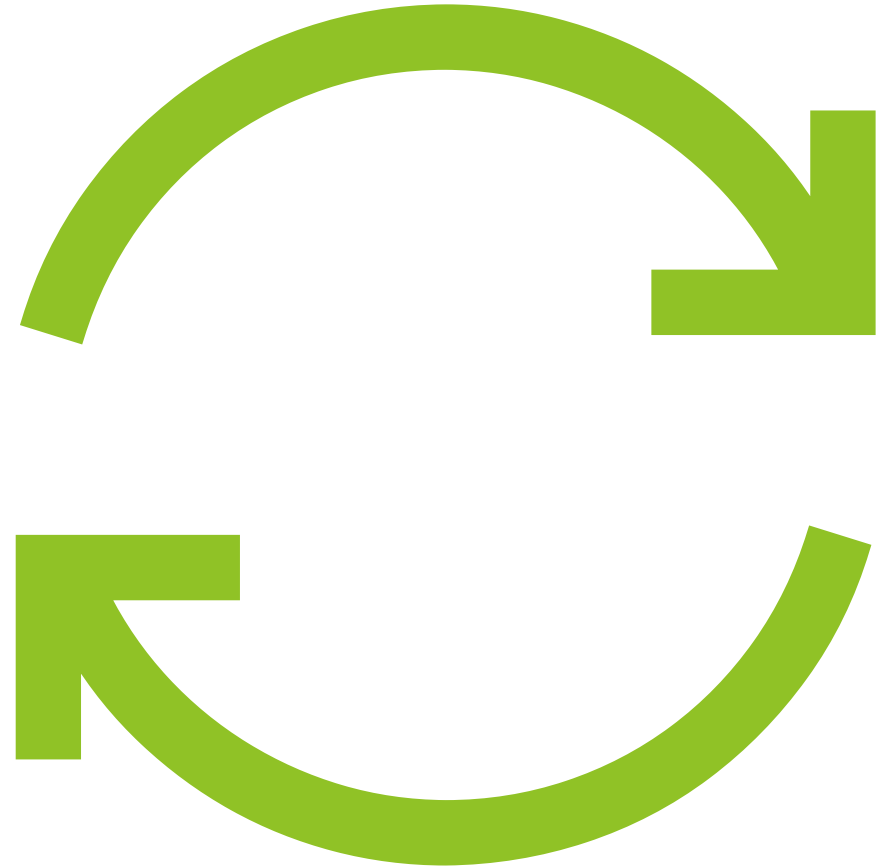
Project Manager, Renewable Energy  
- Electrification

# AGENDA

- ▶ Process for New Projects
- ▶ NV Energy Distribution Process
- ▶ Tips for Reducing EV Infrastructure Costs
- ▶ ERTEP Overview
- ▶ Contractor Information
- ▶ Additional Information

# Process for New Projects

- ▶ Create account & application
- ▶ Property Type & Location
- ▶ Contact Information
- ▶ Project Information
- ▶ Load Information
- ▶ Design Initiation Acceptance (DIA)





# Create Account & Application

- ▶ START A NEW PROJECT ON THE NEW CONSTRUCTION PORTAL
- ▶ REGISTER ACCOUNT
- ▶ CREATE NEW APPLICATION

# Property Type & Location

- ▶ WHAT'S THE PROJECT TYPE?
  - ▶ RESIDENTIAL, COMMERCIAL, MIXED USE, ETC.
- ▶ NEW SERVICE OR UPGRADING SERVICE
- ▶ NAME & LOCATION OF THE PROJECT
  - ▶ APN REQUIRED
- ▶ CONTACT INFORMATION
  - ▶ COMPANY/BUSINESS NAME W/ BUSINESS ID OR INDIVIDUAL

# Project Information

- ▶ WHEN IS THE ON-SITE CONSTRUCTION EXPECTED TO START?
- ▶ WHEN WILL POWER BE REQUIRED FOR THE SITES FIRST METER?
- ▶ ESTIMATED COMPLETION DATE?
- ▶ PROVIDE DESCRIPTION OF THE PROJECT
- ▶ IS THERE TEMPORARY SERVICE REQUIRED FOR THE PROJECT?
- ▶ IS THE PROJECT IN PHASES?

# Additional Project Information

- ▶ FEDERAL-AID FUNDS BEING UTILIZED FOR THE PROJECT?
- ▶ ANY UTILITY, LOCAL, STATE, FEDERAL, OR PRIVATE ENTITY THAT WILL OR COULD CONFLICT WITH THE PROJECT?
- ▶ UTILITY REMOVALS REQUIRED?
- ▶ SOLAR, WIND, OR OTHER RENEWABLES?
- ▶ ELECTRIC VEHICLE CHARGING STATIONS BE INSTALLED?

# Electric Load Information

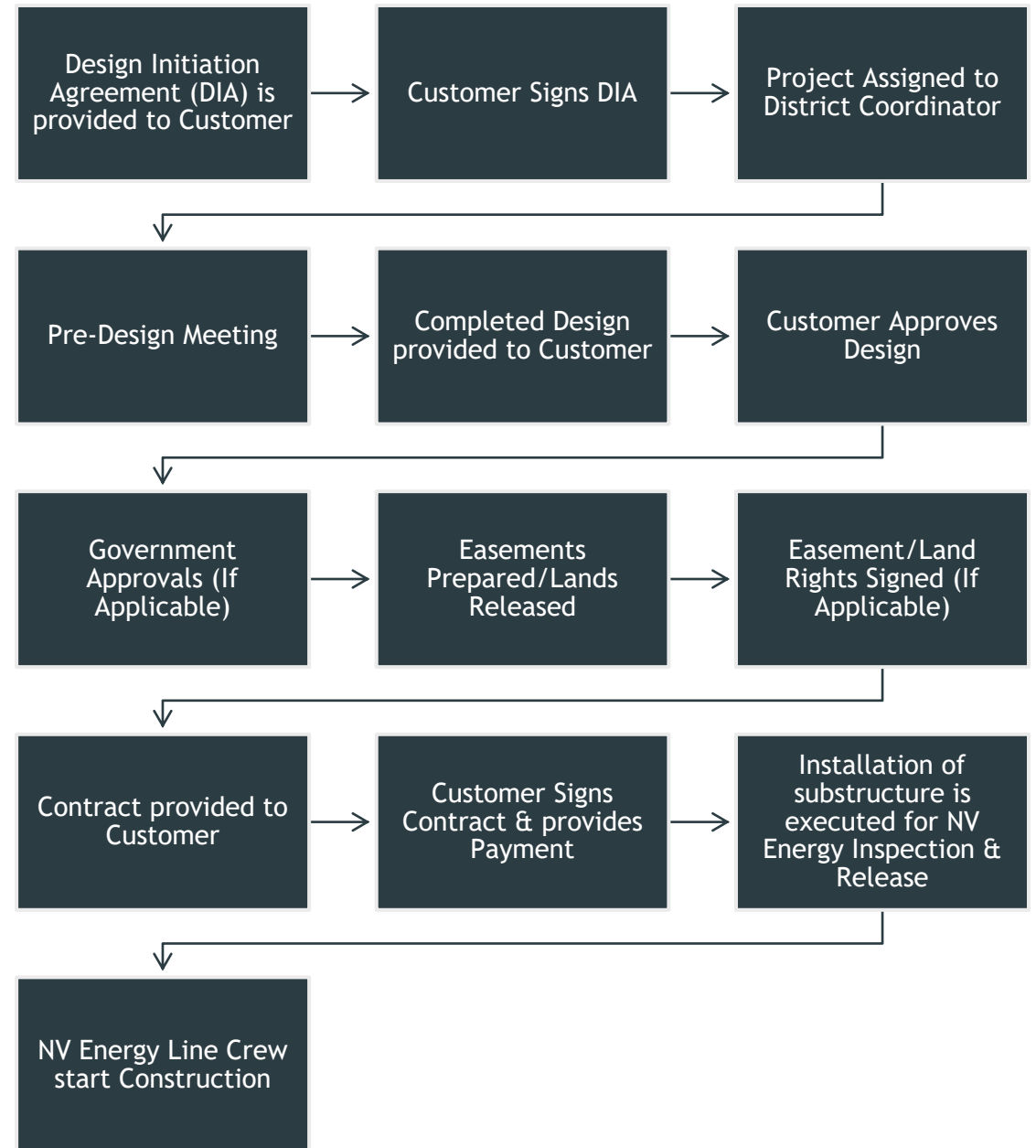
- ▶ WHAT IS THE PROJECT TYPE?
  - ▶ COMMERCIAL, INDUSTRIAL, HOTEL/CASINO
- ▶ # OF NEW UNITS
- ▶ VOLTAGE & PANEL SIZE
- ▶ # OF PANELS & # METERS PER PANEL

# Design Initiation Acceptance

- ▶ PROVIDE THE PROJECT REPRESENTATIVE'S INFORMATION AND AUTHORIZATION (IF APPLICABLE)
- ▶ SUBMIT COMPLETED NEW CONSTRUCTION APPLICATION

# NV Energy Distribution Process

\*Minimum of 24 weeks and Maximum of 87 weeks








# Tips for Reducing EV Infrastructure Costs

- ▶ PASS COST ONTO CONSUMERS
- ▶ FEDERAL INCENTIVES
- ▶ STATE & LOCAL INCENTIVES
- ▶ UTILITY INCENTIVES
- ▶ INTEGRATE SOLAR
- ▶ LOCATION OF CHARGER(S)
- ▶ PROCUREMENT VOLUME
- ▶ SUPPLY CHAIN AWARENESS
- ▶ PLAN FOR THE FUTURE

# Economic Recovery Transportation Electrification Plan (ERTEP) Overview

- ▶ Through the Economic Recovery Transportation Electrification Plan (ERTEP), NV Energy will invest nearly \$100 million to rapidly expand electric vehicle (EV) charging station access across our service territory from 2022 through 2024. ERTEP will help drive economic recovery and accelerate transportation electrification in Nevada by:
- ▶ Strategically expanding charging station access - prioritizing placement in historically underserved communities
- ▶ Increasing access to clean energy job opportunities
- ▶ Supporting EV driver tourism

# Economic Recovery Transportation Electrification Plan (ERTEP) Overview

	Program	Focus	Status
	<b>Interstate Corridor Charging Depots</b>	Public charging along eligible <b>interstate corridors</b> to facilitate EV travel to and from major metros.	Accepting site host interest forms now. Reviewing interest forms.
	<b>Urban Charging Depots</b>	Public charging at eligible <b>downtown or commercial locations</b> .	Accepting site host interest forms now. Reviewing interest forms.
	<b>Public Agency Electric Vehicle Charging</b>	Public charging at eligible <b>community centers, universities/colleges and capitol complexes</b> .	Accepting site host interest forms now. Reviewing interest forms.
	<b>Transit, School Bus &amp; Transportation Electrification</b>	Support transit electrification, electric school bus vehicle-to-grid trials, and non-governmental fleet electrification.	<ul style="list-style-type: none"> <li>• Transit grant project identification discussions in final phase</li> <li>• Custom grant awarded</li> <li>• School bus V2G trial school district meetings underway</li> </ul>
	<b>Outdoor Recreation and Tourism</b>	Public charging at eligible <b>tourist and outdoor recreation destinations</b> .	Accepting site host applications now. Reviewing applications.

# Interstate Corridor Charging Depot

- ▶ THE INTERSTATE CORRIDOR DEPOT PROGRAM WILL INCREASE CHARGING INFRASTRUCTURE ON INTERSTATE CORRIDORS TO FACILITATE EV TRAVEL BETWEEN:
  - ▶ LAS VEGAS AND THE RENO-TAHOE TOURIST AREAS
  - ▶ PARTNERSHIP WITH THE NEVADA DEPARTMENT OF TRANSPORTATION (NDOT)
  - ▶ MOST DRIVERS USING THIS INFRASTRUCTURE ARE ON THEIR WAY TO A DESTINATION AND SEEK TO CHARGE THEIR VEHICLES AS QUICKLY AS POSSIBLE.
  - ▶ LOCAL EV DRIVERS WILL ALSO BENEFIT FROM THIS INFRASTRUCTURE.
  - ▶ SELECTED SITES WILL OFFER:
    - ▶ MULTIPLE CHARGER TYPES ACCESSIBLE TO THE PUBLIC
    - ▶ SHADE CANOPIES
    - ▶ LARGER PARKING SPACES TO FIT BOTH LIGHT AND MEDIUM-DUTY VEHICLES.

INTERSTATE CORRIDOR SITE PROFILES			
<b>Focus Areas</b>	EV charging to and through Nevada for residents and tourists		
<b>Charging Ports per Site</b>	<b>#</b>	<b>Type</b>	<b>kW</b>
	2	L2	19.2
	4	DCFC	150
	2	DCFC	350
<b>Features</b>	Chargers must be selected from an ERTEP-specific qualified equipment list, publicly available and covered by a canopy or awning. In addition, at least one parking space with charging access must be designed with additional spacing available in parking stalls in anticipation of ADA compliance.		
<b>Estimated Sites</b>	2-3		



# Urban Charging Depot

- ▶ PROVIDE PUBLIC ELECTRIC VEHICLE (EV) CHARGING IN ELIGIBLE DOWNTOWN AND COMMERCIAL AREAS
  - ▶ EMPHASIS ON HISTORICALLY UNDERSERVED COMMUNITIES
- ▶ PROVIDES CHARGING INFRASTRUCTURE IN RESIDENTIAL AND COMMERCIAL AREAS FOR:
  - ▶ VISITORS, RESIDENTS, EMPLOYEES, TRANSPORTATION NETWORK COMPANIES (I.E., RIDESHARE, TAXIS), AND LOCAL FLEET VEHICLES.

SITE PROFILE	SMALL COMMERCIAL			COMMERCIAL		
<b>Focus Areas</b>	Residential with small commercial areas; priority for underserved communities			Longer dwell time commercial areas; priority for underserved communities		
<b>Charging Ports per Site</b>	#	Type	kW	#	Type	kW
	4	L2	19.2	2	L2	19.2
	2	DCFC	150	6	DCFC	150
	0	DCFC	350	2	DCFC	350
<b>Site Features</b>	Chargers must be selected from an ERTEP-specific qualified equipment list, publicly available and covered by a canopy or awning. In addition, at least one parking space with charging access must be designed with additional spacing available in parking stalls in anticipation of ADA compliance.					
<b>Estimated Sites</b>	6-8			2-3		

# Public Agency Electric Vehicle Charging

- ▶ THE PUBLIC AGENCY CHARGING PROGRAM SERVES THE PUBLIC, WORKPLACE AND FLEET ELECTRIC CHARGING NEEDS OF FEDERAL, STATE AND LOCAL GOVERNMENT AGENCIES
  - ▶ BY REDUCING THE FINANCIAL BARRIER FOR THE DEPLOYMENT OF ELECTRIC VEHICLE CHARGING INFRASTRUCTURE.
- ▶ THE NV ENERGY TEAM WILL PROVIDE TECHNICAL ADVISORY SERVICES TO HELP ELIGIBLE SITE HOSTS DETERMINE WHERE TO INSTALL CHARGING STATIONS IN ALIGNMENT WITH THE PROGRAM SITE PROFILE.
- ▶ BEYOND TECHNICAL REQUIREMENTS LIKE POWER CAPACITY AND PARKING AVAILABILITY, IDEAL SITES WILL ALSO HAVE 24/7 ACCESS, DUSK TO DAWN LIGHTING AND NEARBY PUBLIC AMENITIES



SITE PROFILE	GRANT SAWYER STATE BUILDING			NEVADA STATE CAPITOL COMPLEX		
	#	Type	kW	#	Type	kW
Charging Ports per Site	10	L2	19.2	6	L2	19.2
Features	Chargers must be publicly available and selected from an ERTEP-specific qualified equipment list. In addition, at least one parking space with charging access must be designed with additional spacing available in parking stalls in anticipation of ADA compliance.					
Estimated Sites	1			1		
SITE PROFILE	COLLEGES			UNIVERSITIES		
	#	Type	kW	#	Type	kW
Charging Ports per Site	20	L2	19.2	40	L2	19.2
Features	Chargers must be publicly available and selected from an ERTEP-specific qualified equipment list. In addition, at least one parking space with charging access must be designed with additional spacing available in parking stalls in anticipation of ADA compliance.					
Estimated Sites	4			2		
SITE PROFILE	SMALL COMMUNITY CENTERS			LARGE COMMUNITY CENTERS		
	#	Type	kW	#	Type	kW
Charging Ports per Site	6	L2	19.2	10	L2	19.2
Features	Chargers must be publicly available and selected from an ERTEP-specific qualified equipment list. In addition, at least one parking space with charging access must be designed with additional spacing available in parking stalls in anticipation of ADA compliance.					
Estimated Sites	8-9			12-14		

# Tourism Program

- ▶ THE TOURISM INCENTIVE PROGRAM AIMS TO PROVIDE FUNDING TO SERVE THE ELECTRIC VEHICLE (EV) CHARGING INFRASTRUCTURE NEEDS OF THE TOURISM ECONOMY IN NV ENERGY'S SERVICE TERRITORY.
- ▶ THE CREATION OF A CRITICAL NETWORK OF CHARGING INFRASTRUCTURE CENTERED AROUND NEVADA'S TOURISM ECONOMY WILL:
  - ▶ BOOST ECONOMIC VALUE IN THE SURROUNDING AREAS THROUGH INCREASED FOOT TRAFFIC
  - ▶ ADVANCED TRANSPORTATION ELECTRIFICATION, REDUCED EMISSIONS
  - ▶ IMPROVED AIR QUALITY AT POPULAR DESTINATIONS.

TOURISM SITE PROFILE			
<b>Focus Area</b>	Support charging at destinations like casinos, sport complexes and ski resorts		
<b>Charging Ports Per Site</b>	#	Type	kW
	10-20	L2	19.2
<b>Estimated Sites</b>	49-53		

# Outdoor Recreation Program

- ▶ THE CREATION OF A NETWORK OF CHARGING INFRASTRUCTURE CENTERED AROUND NEVADA'S TOURISM AND OUTDOOR RECREATION WILL HELP:
  - ▶ ADVANCE ELECTRIFICATION OF MULTIPLE FORMS OF TRANSPORTATION,
  - ▶ REDUCE EMISSIONS AND IMPROVE AIR QUALITY AT POPULAR DESTINATION LOCATIONS.
- ▶ THIS PROGRAM'S OBJECTIVE IS PRIMARILY TO PROVIDE FUNDING TO SERVE THE ELECTRIC VEHICLE (EV) CHARGING INFRASTRUCTURE NEEDS OF TWO ICONIC SITES IN NV ENERGY'S SERVICE TERRITORY.
- ▶ THE INITIAL SELECTION OF LAKE TAHOE AND RED ROCK CANYON IS BASED ON THE PRIORITY OF PROVIDING PUBLIC CHARGING INFRASTRUCTURE CENTERED AROUND THESE GOALS. IN ADDITION, BOTH SITES ARE PRIME LOCATIONS BECAUSE THEY CURRENTLY LACK ADEQUATE EV CHARGING ACCESS AND FREQUENTLY RECEIVE VISITORS TRAVELING LONG DISTANCES.

SITE PROFILE	LAKE TAHOE			RED ROCK CANYON		
<b>Focus Area</b>	Support EV, electric boat and electric bike charging			Support EV and electric bike charging in a high-traffic park		
<b>Charging Ports per Site</b>	#	Type	kW	#	Type	kW
	10	Bike	2	10	Bike	2
	20	L2	19.2	10	L2	19.2
	2	DCFC	150	2	DCFC	150
<b>Shade Canopy</b>	No			Yes (solar canopy)		
<b>ADA Ready</b>	Yes (except boat chargers)			Yes		
<b>Estimated Sites</b>	1 at Sand Harbor, 1 at Incline Village			1		

# ERTEP Ownership Model Options

Responsibilities	Customer Owned	Third Party Owned	NV Energy Owned
Grid Side & Make Ready Costs	100% funded and completed by NV Energy		
Charging Site Project Costs	Up to 100% reimbursed by NV Energy over 5 years upon approval of submitted claim package. 75% of approved project costs will be reimbursed after claim package acceptance. The remaining 25% of approved project costs will be paid in 5% increments pending uptime/reporting requirement compliance.*		100% funded upfront by NV Energy
Procurement & Installation	Customer procures & installs charging equipment from pre-qualified vendors	Third party procures & installs charging equipment from pre-qualified vendors	NV Energy works directly with pre-qualified vendors to procure & install charging equipment
Electric Service	Customer pays utility bill for charging site	Third party pays utility bill for charging site	NV Energy pays utility bill for charging site
Charging Fee	Fees set & collected by Customer	Fees set & collected by third party	Set NVEVCN Tariff Rates** collected by NV Energy
Preventative & Corrective Maintenance	Customer	Third party	NV Energy
Quarterly Charger Data Report			
Key Agreements	Agreements between NV Energy and Customer, Customer and others	Agreements between third party and Customer, third party and NV Energy	Agreements between NV Energy and Customer directly
Overview	Customer is responsible for up-front financial investment and maintenance/reporting.	Third party is responsible for up-front financial investment and maintenance/reporting.	<b>NV Energy takes on all financial and operational responsibilities for you.</b>

\*Public Agency & Regional Transportation Sites: 100% of approved project costs will be paid after claim package acceptance

\* Tourism program cannot have NV Energy Ownership and has a \$300k incentive cap

# Contractor Information

Electric Vehicle Infrastructure Training Program  
(EVITP)

<https://evitp.org/training>



NV Contractors Board

<http://www.nvcontractorsboard.com>



# Additional Information

NV Energy ERTEP Website

<https://www.nvenergy.com/cleanenergy/ertep>



NV Energy New Construction

<https://ncp.nvenergy.com>



# Data-Driven EV Charging

Planning your charging infrastructure for today and the future



# Data-Driven Fleet Electrification

- Founded in 2017
- Deep expertise in
  - Energy modeling
  - Duty cycle characterization
  - Telematics
  - Fleet electrification & sustainability
- Neutral advisor, trusted by 180+ fleets



**1 Billion**  
Miles Analyzed

**100 million**  
Trips Assessed

**6,000,000 tons**  
Annual GHG Reductions

**\$600 million**  
Savings Potential

# Vehicle Procurement Roadmap

## Operational Fit

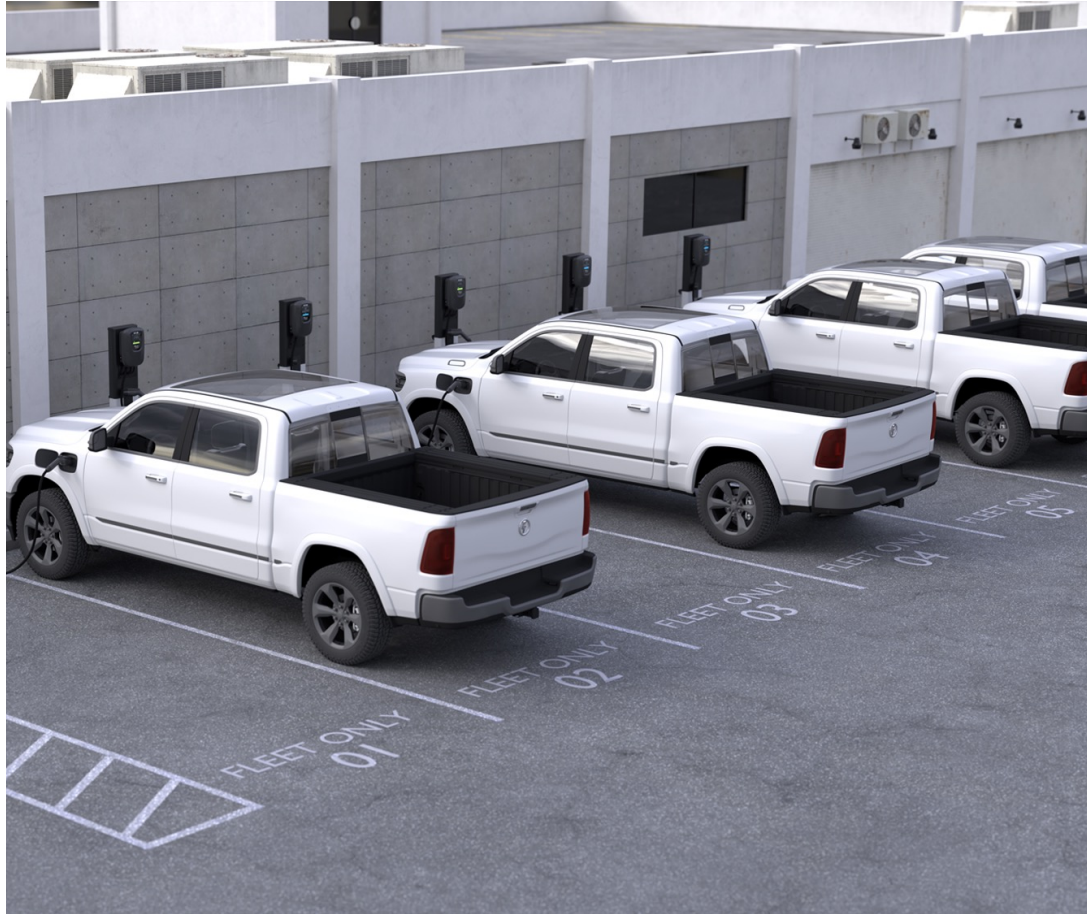
- Go vs no-go



## Financial Impact

- Upfront capital cost
- Grants/funding available
- Fueling budget vs electricity budget
- Are there vehicles where the TCO is lower in an EV

# Infrastructure First Steps



- How many ports?
- What level of chargers do I need?
- Where do I need them?
- When do I need them up and functioning?

# Vehicle-centric Approach

- How many vehicles will be EVs each year? Which vehicles?
- Where are those vehicles extend dwell periods?
- How much energy does each vehicle need each day?
- Are utility upgrades required?



# Right-Sized EVSE - Now and Future

## Recommended Replacement: 2023 Peterbilt 579 Electric



Observation Period: 2/15/2022 - 3/28/2023

Days Tracked: 409 days

Trips Tracked: 6314 trips

Last Trip: 3/28/2023

Model: 2019 Volvo Truck VNR

Economics & Environment    Parking & Charging    Assumptions

### Parking & Projected Charging Locations

#### Observed parking locations

These are all the locations where your vehicle parked for an extended period of time. These 'extended dwell periods' are any parking event that exceeds 9 hours.

Address	Dwell Time (Avg Hrs)	Frequency
REI Flagship Denver	14	98%
Four Seasons Denver	16	2%
Matchbox	16	<1%

For the purpose of calculating dwell time (average hours), extended dwell periods are capped at a duration of 16 hours.

To find existing charging infrastructure near you, visit [Alternative Fuels Data Center](#).

To view average electricity prices by State, visit [U.S. Energy Information Administration](#).

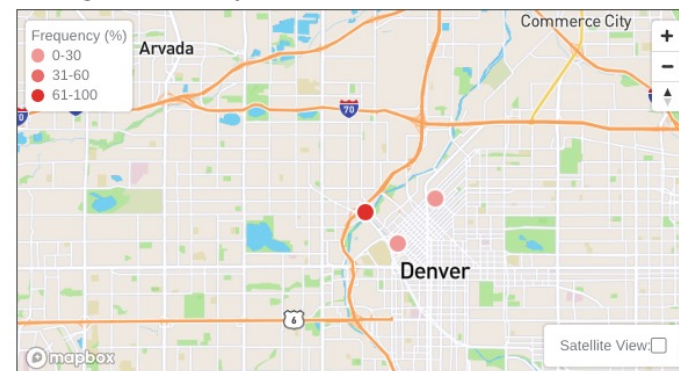
### Charge Time & Cost

#### Average on days used

These metrics estimate what the charging needs and cost would be if the miles driven by your 2021 Volvo Truck VNR had been driven in a 2023 Peterbilt 579 Electric.

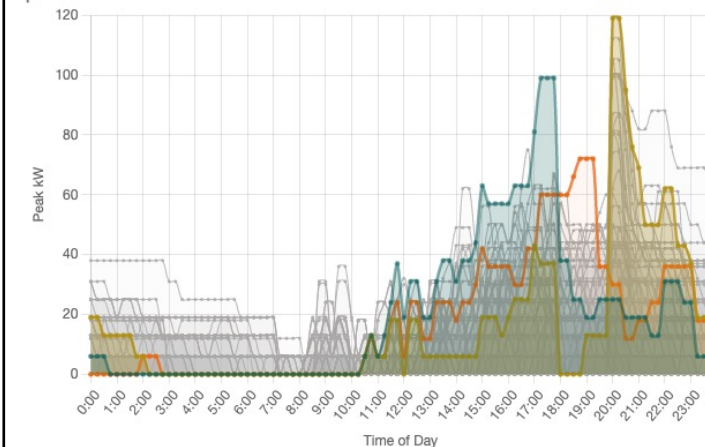
Average Daily kWh	Max Daily kWh	Usable Battery Capacity (kWh)	Level 2 Hrs	DCFC Hrs	Daily Cost
35	177.3	368	5.6	0.8	\$0.00

### Parking Locations Map

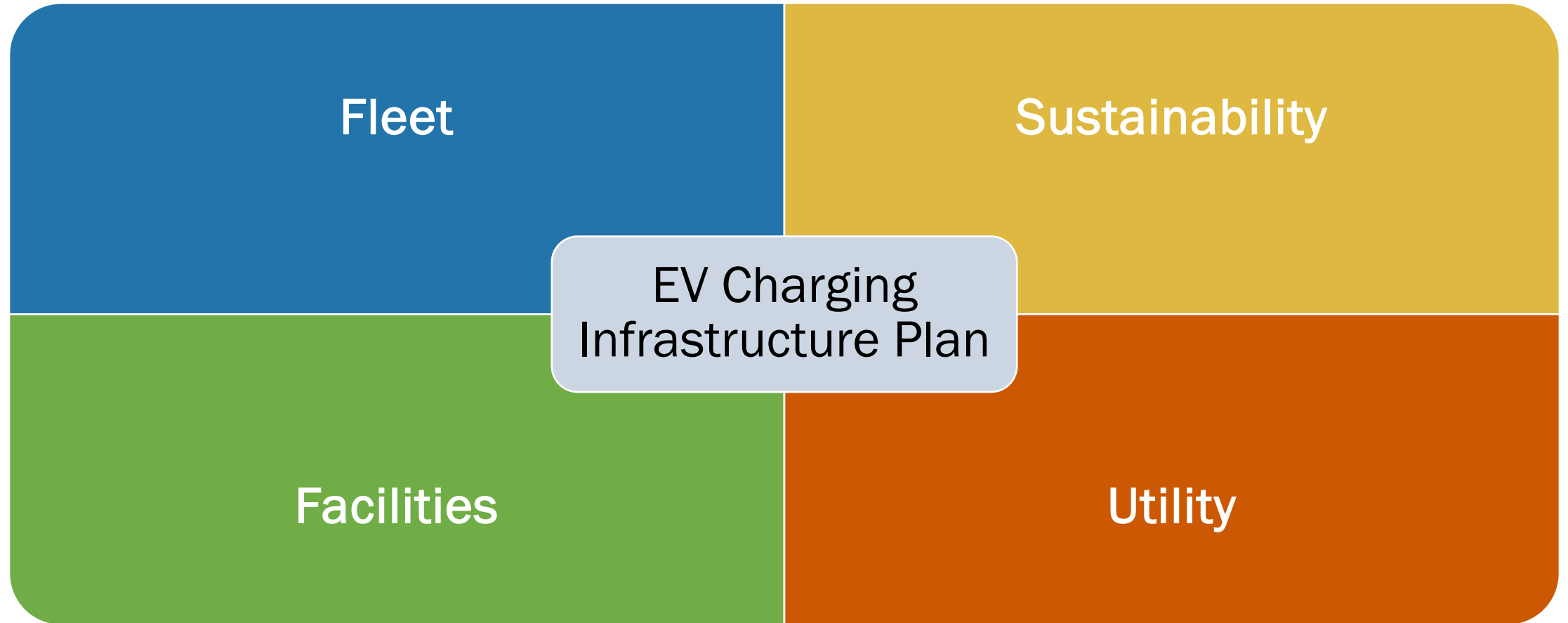


### TOD kW Demand - Selected Period

This graph shows the projected daily demand curves for each day of the selected period.



# Engage Stakeholders Early



# THANK YOU

Sarah Booth

COO

Sawatch Labs

[booth@sawatchlabs.com](mailto:booth@sawatchlabs.com)

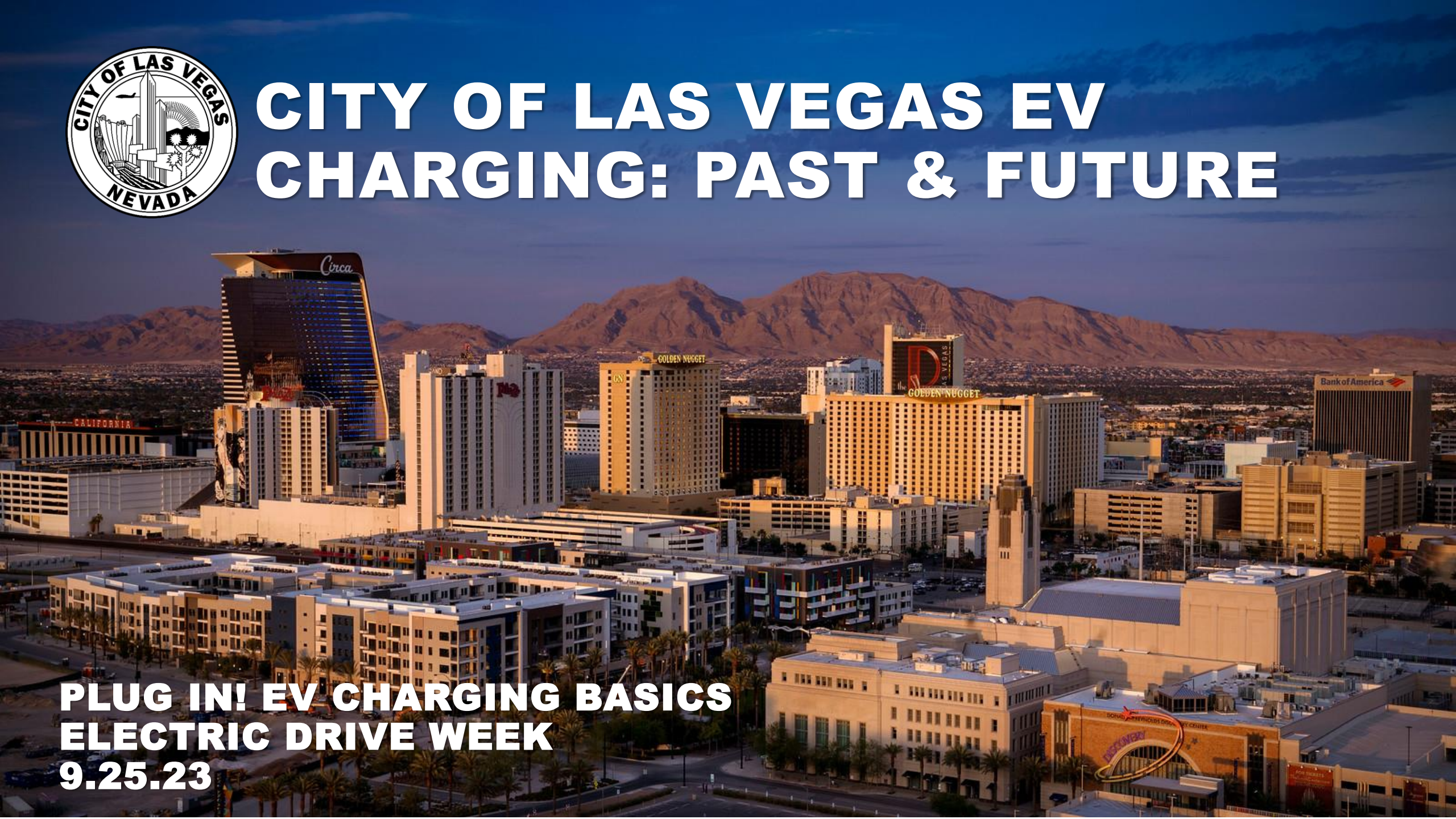


**SAWATCH**  
LABS



# CITY OF LAS VEGAS EV CHARGING: PAST & FUTURE

**PLUG IN! EV CHARGING BASICS  
ELECTRIC DRIVE WEEK  
9.25.23**





# SUSTAINABILITY INITIATIVE

- City of Las Vegas committed to sustainable growth, development, planning
- LEED for Cities – LEED Gold
- National leader in:
  - LEED Green Certified Buildings
  - Renewable energy
  - Energy efficiency
  - Water conservation
  - Waste diversion
  - Sustainable planning
  - **Alternative transportation**
- History of concerted effort to build and support electric vehicle infrastructure

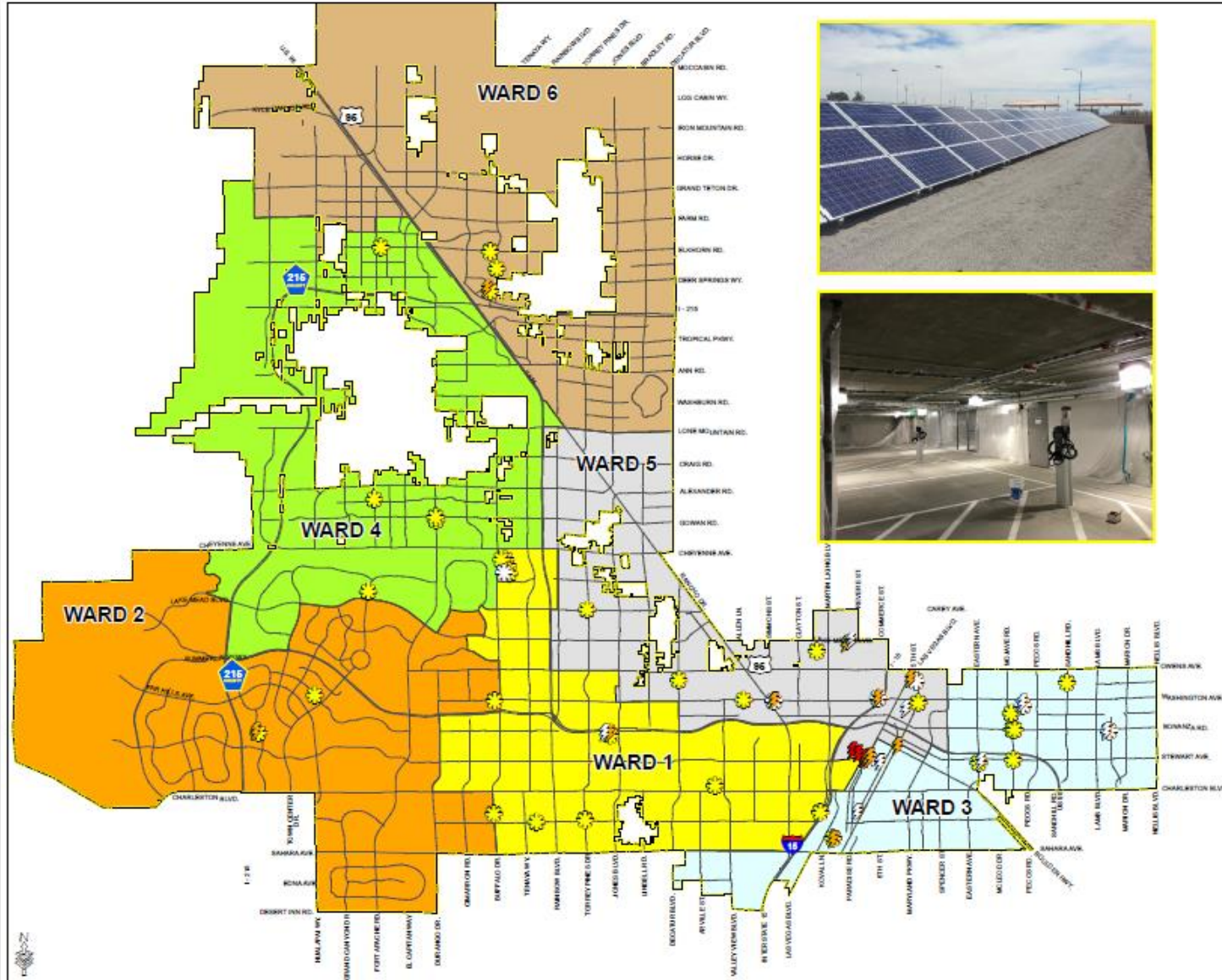


# 1<sup>ST</sup> GEN EV CHARGING DEMO PROGRAM

- 2009 – 2013: Congressionally Designated Project: Plug-in Hybrid Electric Vehicle Demonstration Program
  - 1<sup>st</sup> NV municipality to purchase/test electric & hybrid fleet vehicles
  - Initial deployment of EV charging stations
- Procured stations made publicly available
- After completion, EV market continued to expand



# 1<sup>ST</sup> GEN EV CHARGING DEMO PROGRAM



## City of Las Vegas

City Wide Solar & EV Charging Locations (by Ward)

City Limits

### Legend

City Facility - Installed Solar PV System

- Existing Solar PV System
- Proposed Solar PV System

City Facility - Installed EV Charging Locations

- Existing EV Charging Location
- Proposed EV Charging Location
- LV4EV Replacements Requested



GIS maps are normally produced only to meet the needs of the City. Due to continuous development activity this map is for reference only.  
Geographic Information System  
Planning & Development Dept.  
702-225-4301

Printed: Thursday, August 10, 2023

# GOALS AND OUTCOMES

- City of Las Vegas 2050 Master Plan
- Opportunity: Utilize electric vehicles to reduce emissions
- 2050 Plan Outcomes
  - Number of public EV charging stations increases to 1.07 per 10,000 residents
  - EV registrations increase over time
- Alignment with NVEnergy transportation programs
  - Expand charging station access in historically underserved communities
  - EV driver tourism





# LV4EV – WHAT IS IT?

- \$5 million request – Charging and Fueling Infrastructure Grant (USDOT)
- Installation of 28 dual-port Level 2 7.2 kW EV chargers
- 8 sites within CLV
  - City-owned or city-controlled
  - Publicly accessible
- Outreach/educational campaign



# LV4EV – WHAT IS IT?

- ADA compliant site design
- Security features for safety while charging
  - Lighting
  - Video surveillance
- Post-implementation study to evaluate effectiveness
  - To be analyzed, shared with other agencies/stakeholders
- Continued city maintenance
  - Monitoring usage and performance



# LV4EV – WHY?

- Overall Goals
  - Enhancing local air quality
  - Reducing GHGs
  - Equitable access
  - Improved safety/security of charging sites
- Public engagement/education campaign
  - Improve project quality
  - Community understanding
  - Inform about programs for EV usage
- Addressing transportation disparities
- Enhance job/education access
- Provide more transportation options



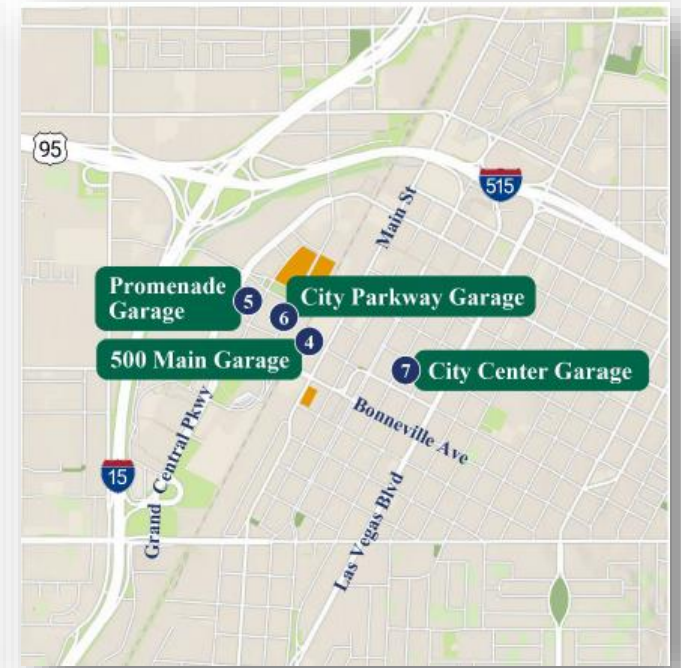
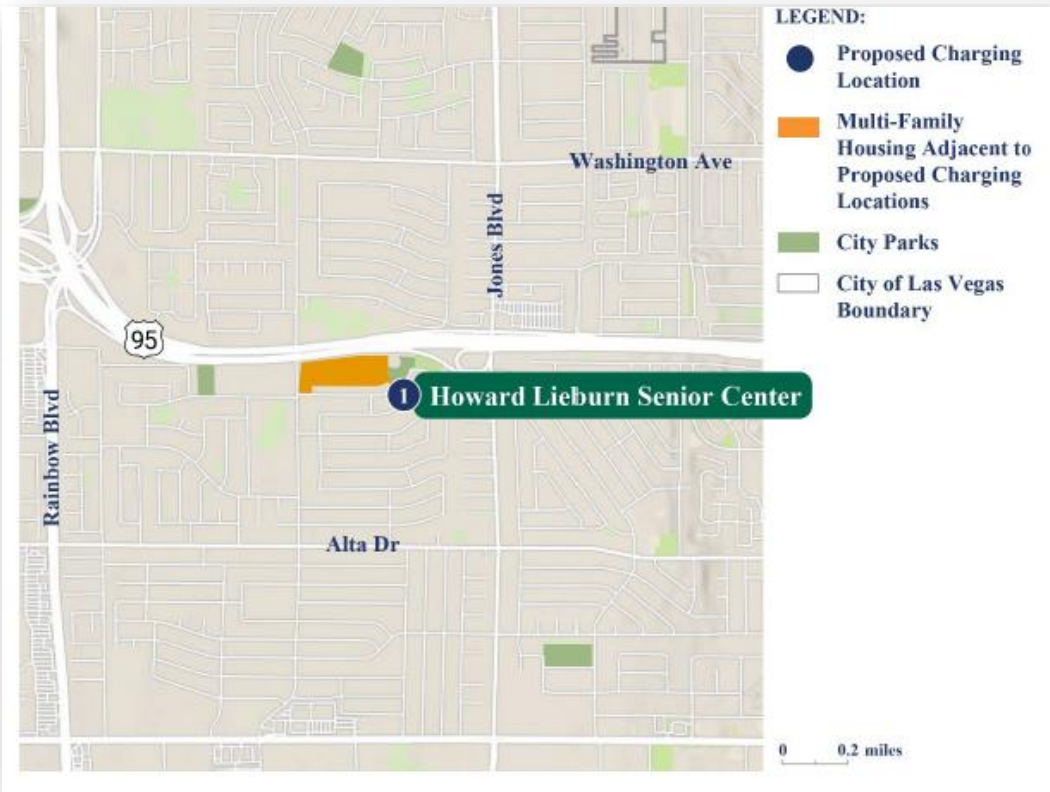


# LV4EV - WHERE

- Selected using GIS mapping based on:
  - Gaps in existing charging network
  - Within or adjacent to Justice40 communities
  - On City properties
    - Public access
  - Within walking distance of multi-family housing



# LV4EV - WHERE



# LV4EV - WHEN

- Design Phase: End of 2023
  - Environmental Clearance: Early 2024
  - Construction: Mid 2024 - 2025
  - Educational Outreach throughout
  - Post-Implementation Study: 2026
- 
- **Next steps**
  - EV Charging Infrastructure Ordinance
    - SB 448 (2021) / ERTEP: Electric vehicle charging infrastructure expansion
      - Mirabelli Community Center
      - Doolittle Community Center
    - AMP: Pilot Affordable EV Car Sharing
      - Participation agreement for DOE grant





## UPCOMING

- Drive Electric Event!
  - Saturday, September 30
  - 12 - 4pm
  - 4701 W Russell Rd
  - Ride and Drives, demos, presentations, and food vendors
  - 25+ vehicles on display
  - RSVP for a gift!



[DriveElectricWeek.org](https://DriveElectricWeek.org)

# UPCOMING

- Electric Recreation (webinar)
  - Thursday, October 19
  - 12 - 1:30pm
  - Electric boats, ATVs, and more
- 1-Year Stakeholder Meeting (in person)
  - Wednesday, November 1
  - 12 - 1:30pm
  - 4701 W Russell Road





# THANK YOU!

Nicole Wargo

Fellow, Clark County Department of Environment and Sustainability

Director, Southern Nevada Clean Cities Coalition

[Nicole.Wargo@ClarkCountyNV.gov](mailto:Nicole.Wargo@ClarkCountyNV.gov)

