

Add Some Spark to Your Fleet: Fleet Electrification

Moderator: John Bertino, Olsson

Speakers:

- Brian Marshall, Senior Business Consultant, Olsson
- Col. Eric Crispino, USA (Ret.), Southwest Region Program Manager, Richard Group LLC

May 14, 2024, 1:30 p.m.



Add Some Spark to Your Fleet

Moving to a battery
electric fleet of vehicles



20
24

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MODERATOR



John Bertino

Olsson

Federal Client Relationship Manager

Fun Facts

- Sports Teams – Chicago Cubs, Kansas City Chiefs, NU Football
- Vacation Spots – San Deigo, CA
- Did you Know I... Wood Turn
- Hobbies - Hunting

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SPEAKER



**Brian Marshall
Olsson**
Senior Business Consultant

Fun Facts

- How 'bout those K.C. Chiefs
- Favorite vacation spots: Anywhere in the Rocky Mountains
- Hobbies: Cycling, fishing, hiking...all things outdoors



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SPEAKER



Col. Eric Crispino. USA (Ret.)
Richard Group LLC
Southwest Region Program Manager

Fun Facts

- Born into a Red Sox, Patriots, Celtics, Whalers, and UCONN Women's Basketball family, but moved so many times I now support the closest geographic teams
- Enjoys ski vacations at Vail (or Beaver Creek or Breckenridge or Keystone)
- Part of an infamous group of West Point cadets who accidentally made a human sign which read "BEAN TAVY"
- Builds furniture using hand-powered tools

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- The presenter will unlock the poll(s) during the presentation.
- Please complete a brief Evaluation Survey at the end of the session.

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Agenda

- Fleet Electrification Considerations
- Case Study: VA Hospitals
- Questions & Answers

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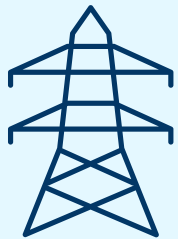
Learning Objectives



How can I take concrete steps towards an EV fleet?



How do I plan for EV charging infrastructure?



Should I coordinate with my local utility?



How do I avoid common pitfalls and mistakes?

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Live Content Slide

Poll: What is the primary driving factor leading your fleet electrification activities?

Sustainable Transportation



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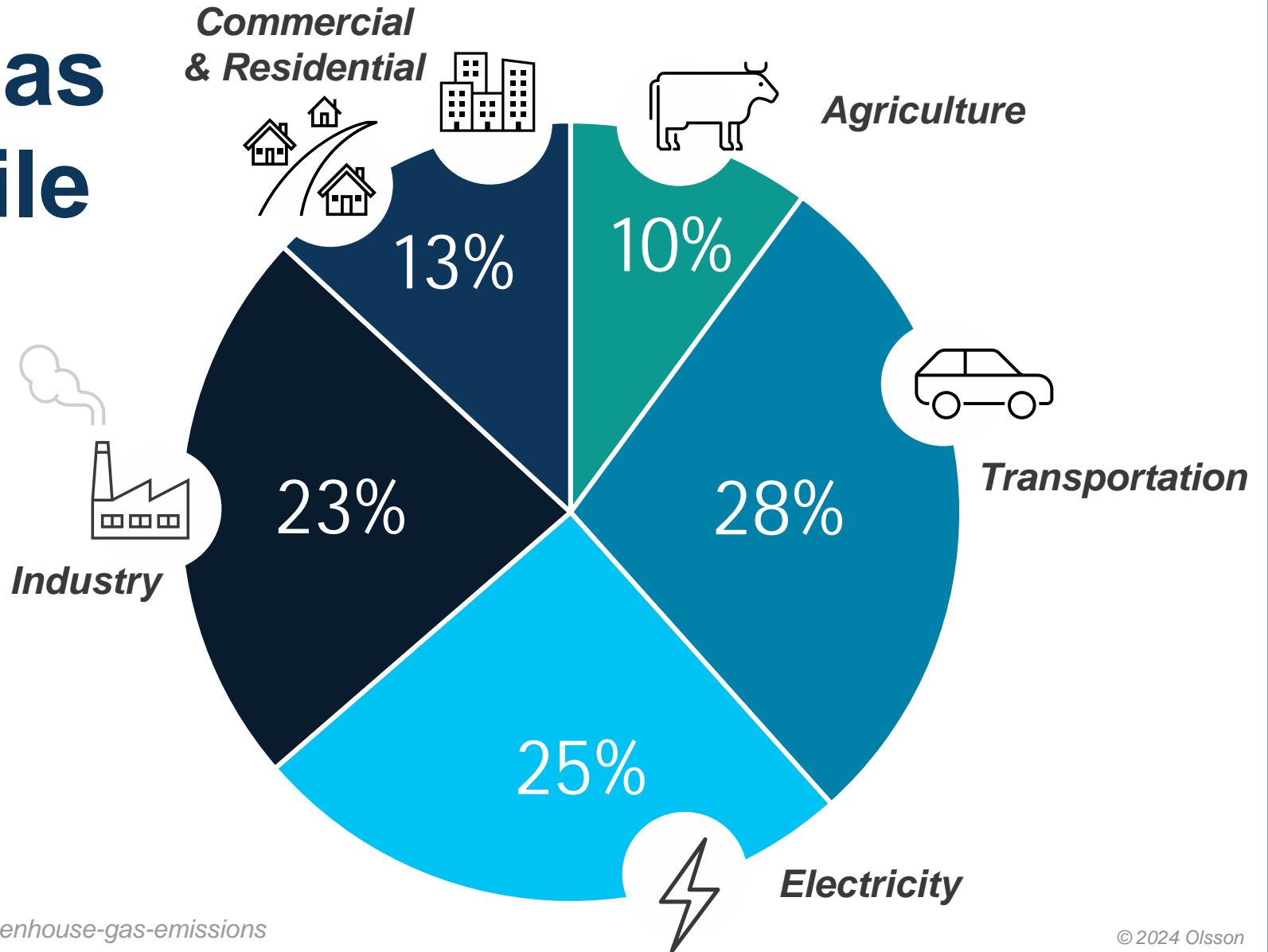
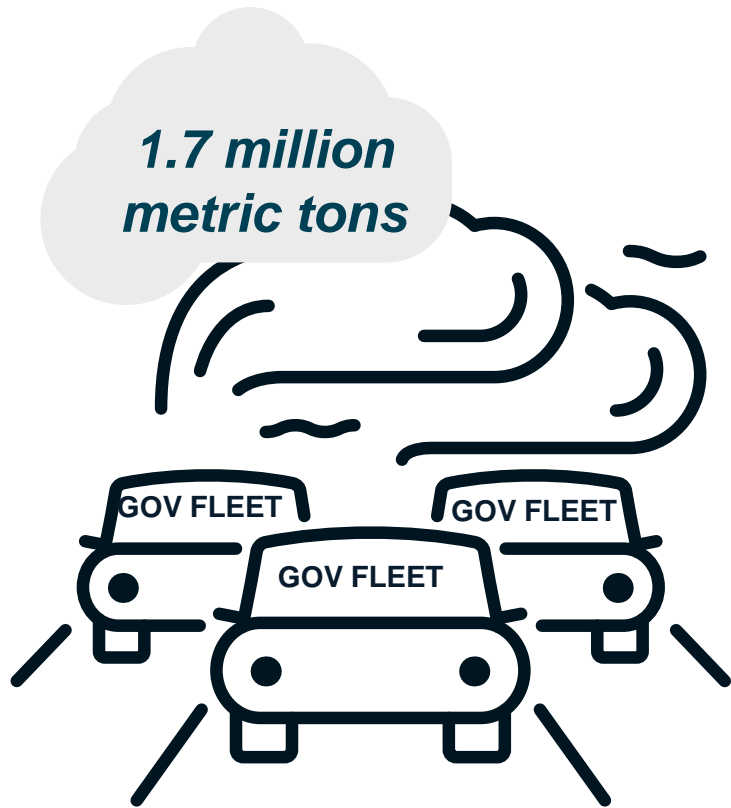


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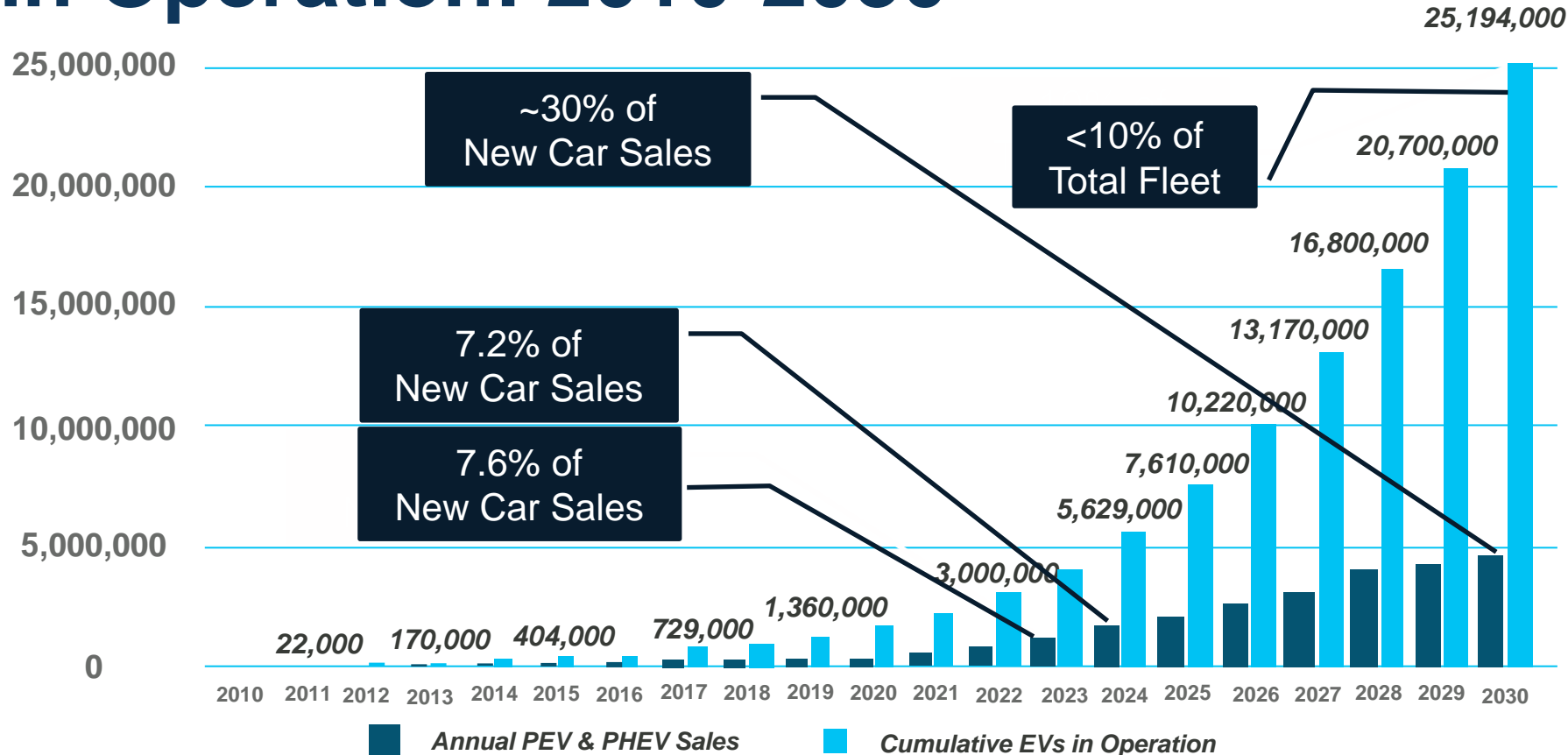
Greenhouse Gas Emission Profile



SOURCE: <https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions>

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Cumulative US Electric Vehicles in Operation: 2010-2030



Vehicle Segment Summary



17%
Mid-Sized SUV/Crossover



15.33%
Compact SUV/Crossover



14%
Full-Size Truck

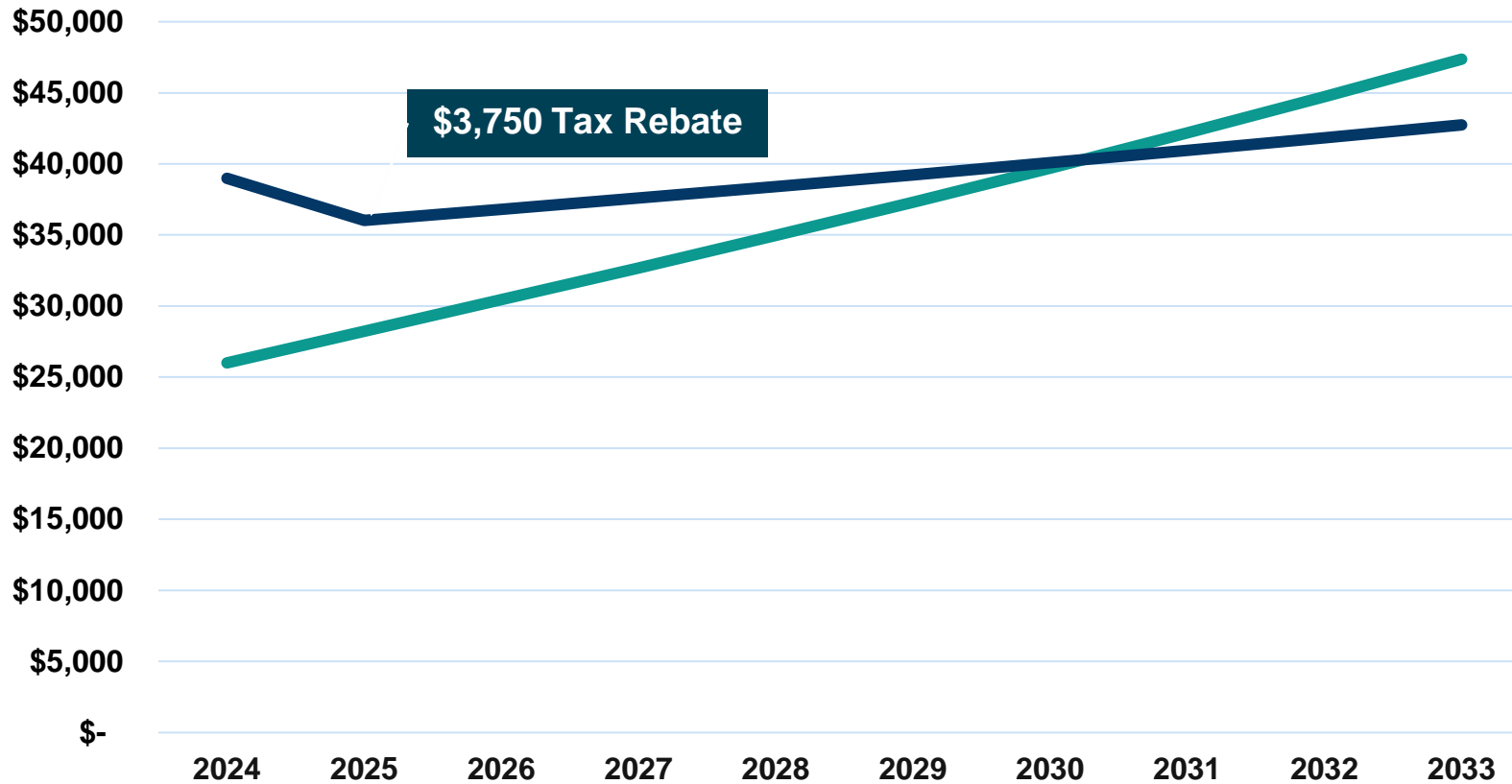


7%
Subcompact SUV/Crossover

Historical Data: GoodCarBadCar.net, InsideEVs, HIS Markit | Auto Manufacturers Alliance, Advanced Technology Sales Dashboard | Research, Forecast & Chart: Loren McDonald / EVAdoption

<https://evadoption.com/ev-sales/ev-sales-forecasts/>

Total Cost of Ownership



INPUTS

Mileage	15,000/year
Gasoline	\$3.39/gallon
Electricity	\$0.11/kWh
Baseline Maintenance	\$532/year
EV Maintenance	30% Improvement

TESLA MODEL 3

CHEVY MALIBU

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Executive Order 14057: Dec - 2021

- Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability
- Section 204. Transitioning to a Zero-Emission Fleet
- Light-duty vehicle acquisitions shall be zero-emission by end of 2027
- Fleets over 20 vehicles shall develop a zero-emission fleet strategy
 - Maximize acquisition
 - Fleet Right-sizing
 - Re-fueling infrastructure



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Fleet Composition



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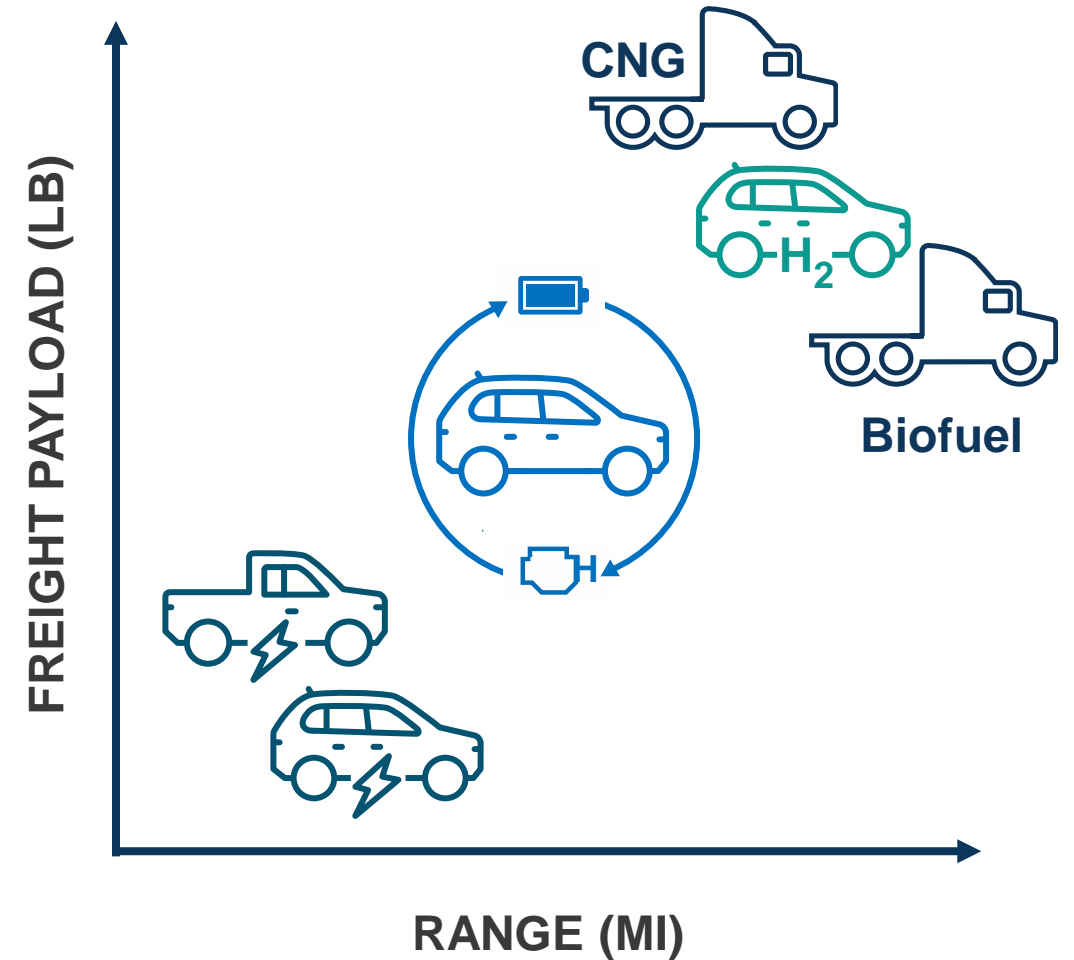
Electric Vehicle Selection

Vehicle Segment	Weight Class	Example Fleet Vehicle(s)	Pictures	Administration	Planning and Development Services	Engineering Division	Facilities	Transit	Police Department	Emergency Services
Motorcycle	Class 1 (<6k lbs.)	Harley-Davidson								
Sedan (Car)	Class 1 (<6k lbs.)	Toyota Camry/ Chevy Malibu								
MiniVan	Class 1 (<6k lbs.)	Dodge Grand Caravan								
SUV	Class 1 (<6k lbs.)	Chevy Traverse/ Ford Explorer								
Light- Duty Pickup Truck (1/2 Ton)	Class 2 (6k - 10k lbs.)	Ford F-150/ Chevy Silverado 1500								
Utility Cargo Van	Class 2 (6k - 10k lbs.)	Ford Transit/ Ram Promaster								
Pickup Truck - 3/4 Ton	Class 3 (10k - 14k lbs.)	Ford F-350/ Chevy Silverado 3500								
Pickup Truck - 1 Ton	Class 4 (14k - 16k lbs.)	Ford F-450/ Chevy Silverado 4500								
Vans & Box Trucks	Class 4 (14k - 16k lbs.)	Box Truck/ Cutaway								
Truck - 2 Ton	Class 5 (16k - 19.5k lbs.)	Bucket Truck/ Snow Plow/ Ford F-550/ Chevy Silverado 5500								
School Bus	Class 6 (19.5k - 26k lbs.)	Standard school bus								
Medium Duty Truck	Class 6 (19.5k - 26k lbs.)	Straight box truck								
Transit Bus	Class 7 (26k - 33k lbs.)	Standard transit bus								
Refuse Truck	Class 7 (26k - 33k lbs.)	Refuse applications								
Regional Haul Freight Truck	Class 7 (26k - 33k lbs.)	Day cab truck								
Specialty MD/HD Vehicle	Class 4 - Class 8	Various specialty applications and chassis								
Heavy Duty Truck	Class 8 (>33k lbs.)	Cement Truck/ Dump Truck/ Sleeper cab truck								

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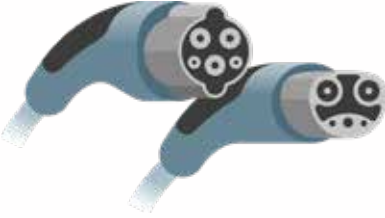

Other Low/No Emission Technologies

- Hybrid Solutions
- Biofuels – reduced emissions
- Compressed Natural Gas (CNG) and RNG
- Hydrogen
 - Combustion
 - Fuel Cell



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Charging Times

Vehicle			20%-to-80% Charging Time				
			Level 2 AC Charging		DC Charging		
Charger Examples							
Model	Battery	Range	Fast 3.7kW 240 VAC/ 16A	Fast 19.2kW 240 VAC/ 80A	Rapid 43-55kW 200-450 VDC/ 80A	“Super” 250kW 200-450 VDC/ 200A	“Mega” 3,750kW 1,250 VDC/ 3,000A
Tesla Model S	75kWh	249 miles	12 hrs	2 hrs	50 min	11 min	-
Ford Lightning	98kWh	230 miles	16 hrs	3 hrs	1 hrs	14 min	-
BYD Box Truck	221kWh	125 miles	-	5 hrs	2 hrs	25 min	2 min
Volvo VNR	375kWh	175 miles	-	-	4 hrs	54 min	4 min

*Note: Charge times based on 20% to 80% SOC

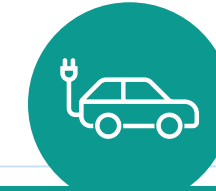
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Facility Load Profile

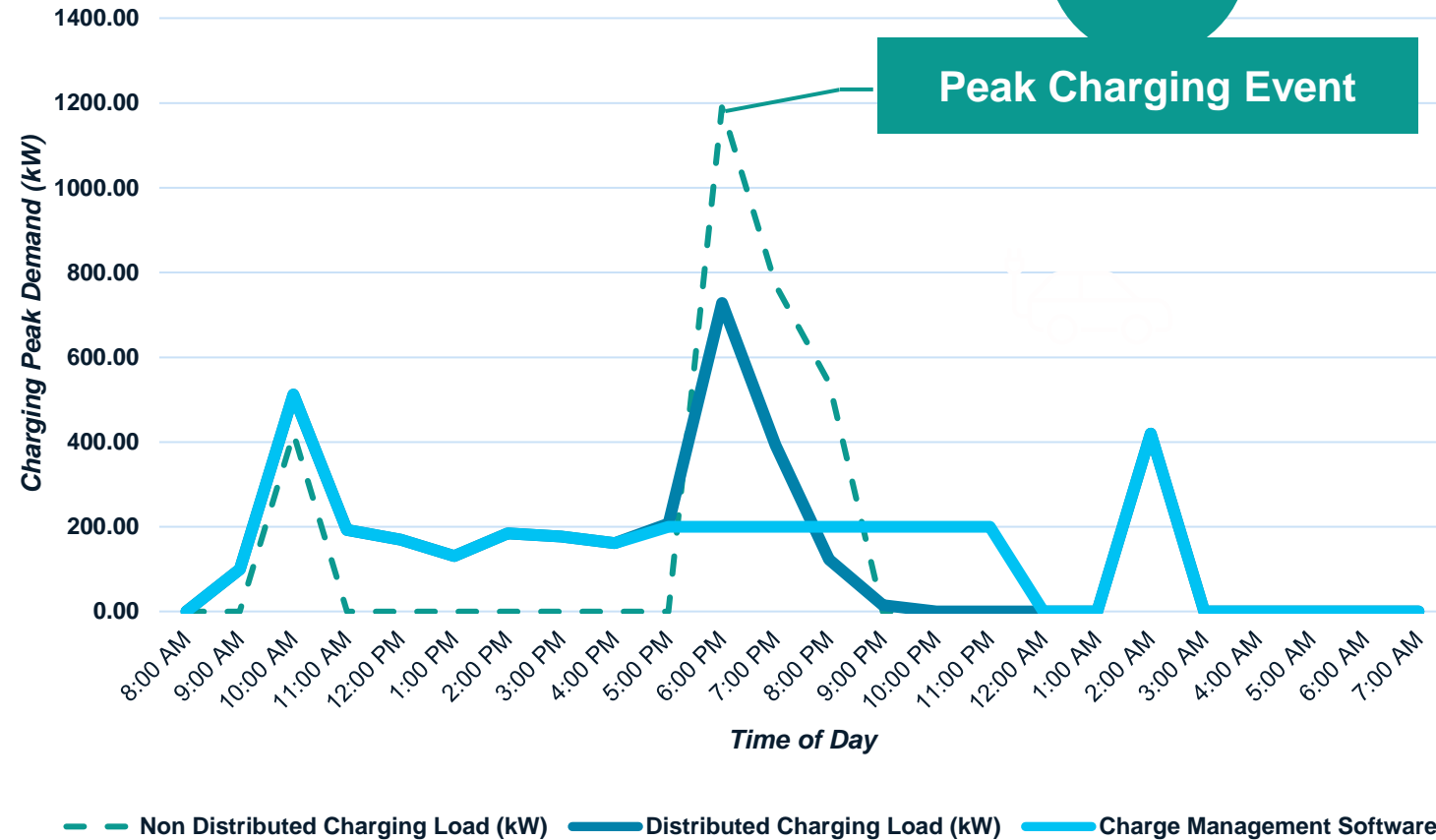
Three charging scenarios:

- Unmanaged Charging
- Diversified manual management
- Charge Management System

Charging Load Profile



Peak Charging Event



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Utility Engagement



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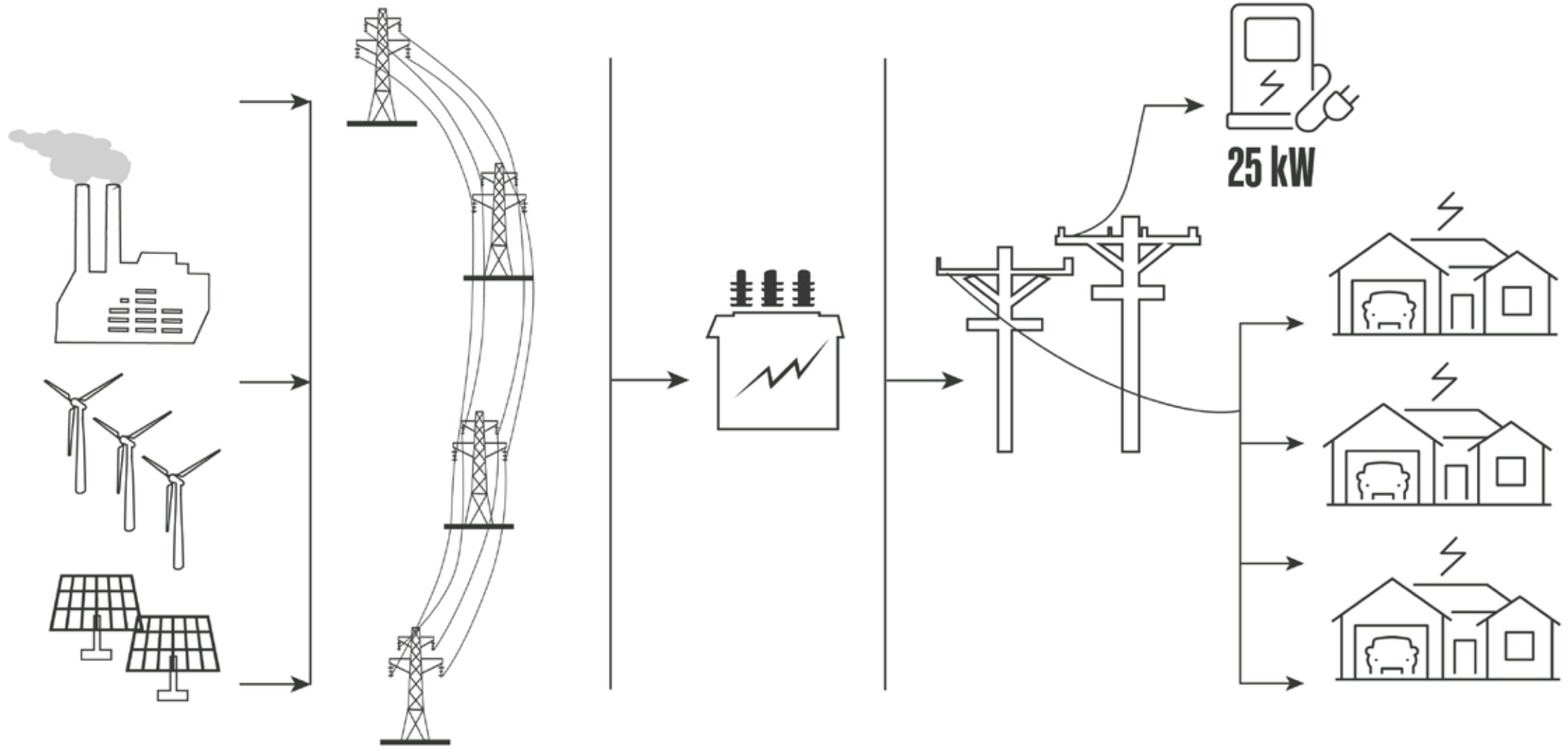
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Live Content Slide

Poll: How much additional electrical demand will a fleet of 50 battery-electric, light-duty vehicles require?



GENERATION

TRANSMISSION

SUBSTATION

DISTRIBUTION

POWER CONSUMERS

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Other Utility Considerations



Coordination

- § New Service Request
- § Capacity Assessment
- § Load Profile Estimation



Incentives

- § Make-Ready Programs
- § Revenue Justification
- § Rebates on EVSE



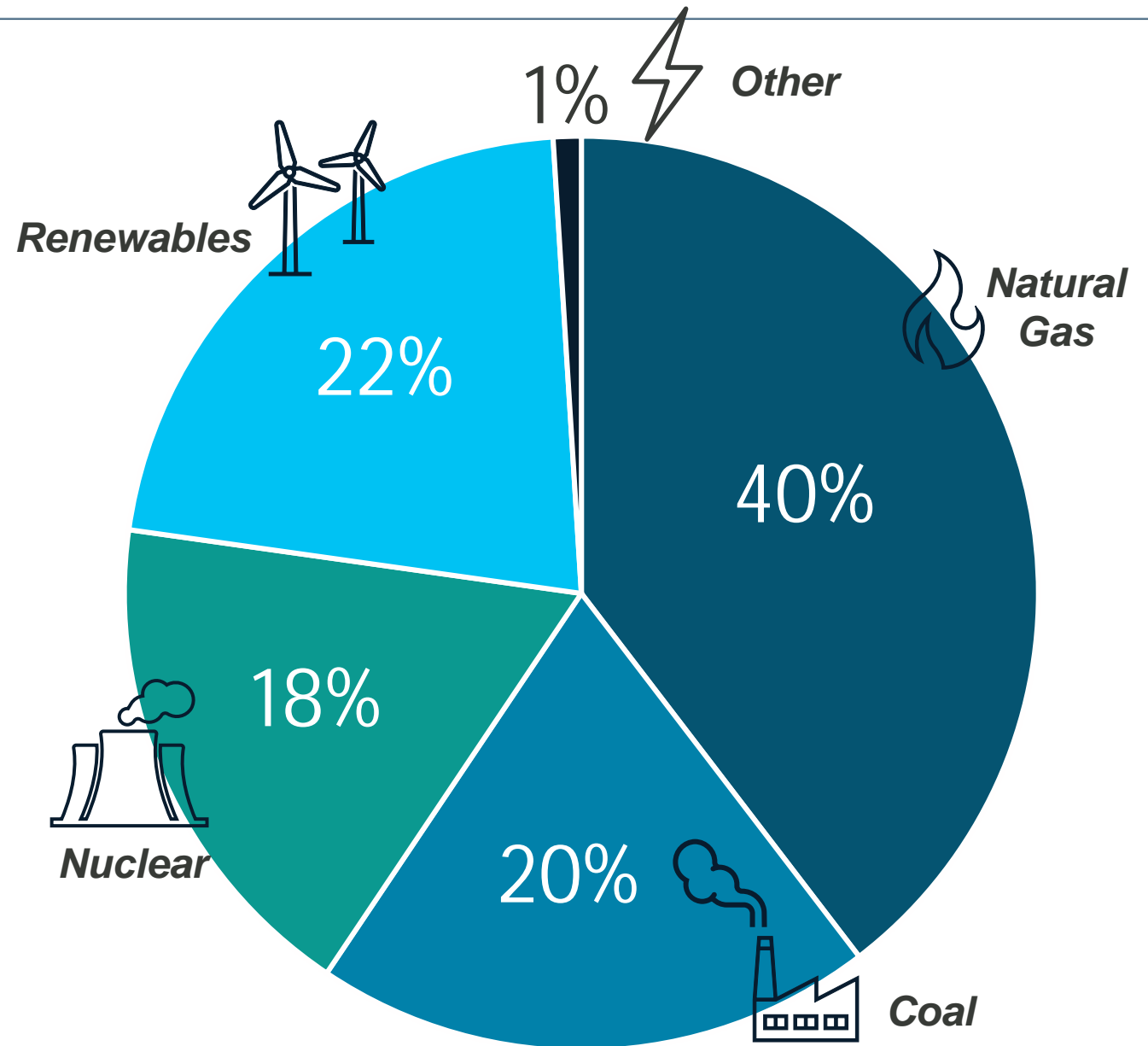
Rate Structures

- § Time of Use
- § Demand Charges
- § Renewable Offset Programs

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U.S. Electricity Generation by Source

- New sources are mostly renewable
- Time of energy use is important
- Sustainability objectives can be impacted by generation source
- Need for battery storage

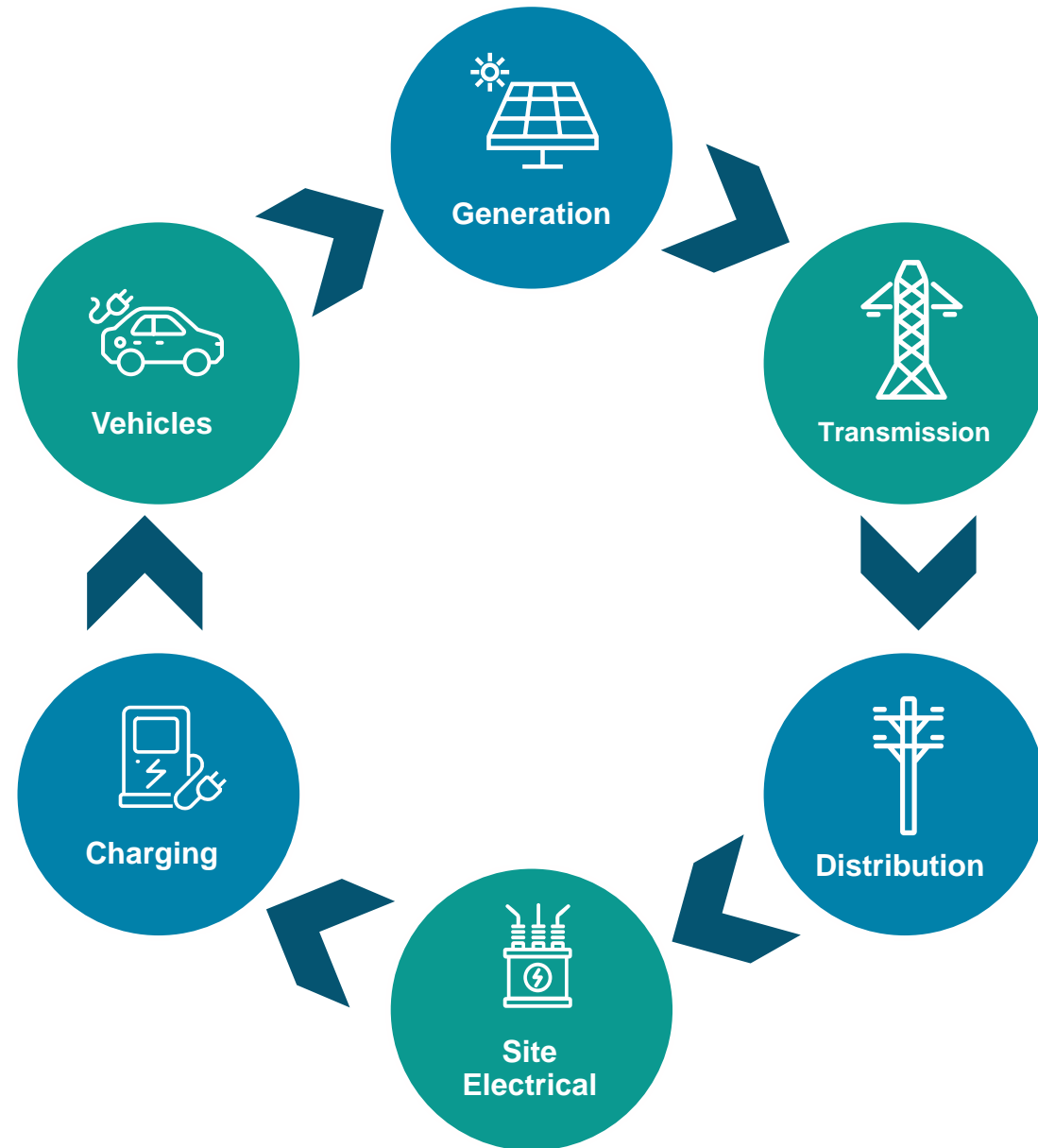


SOURCE: <https://www.eia.gov>

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Resiliency

- Contingency Planning
- Redundancy
- Microgrids
- Backup Power



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Site Considerations



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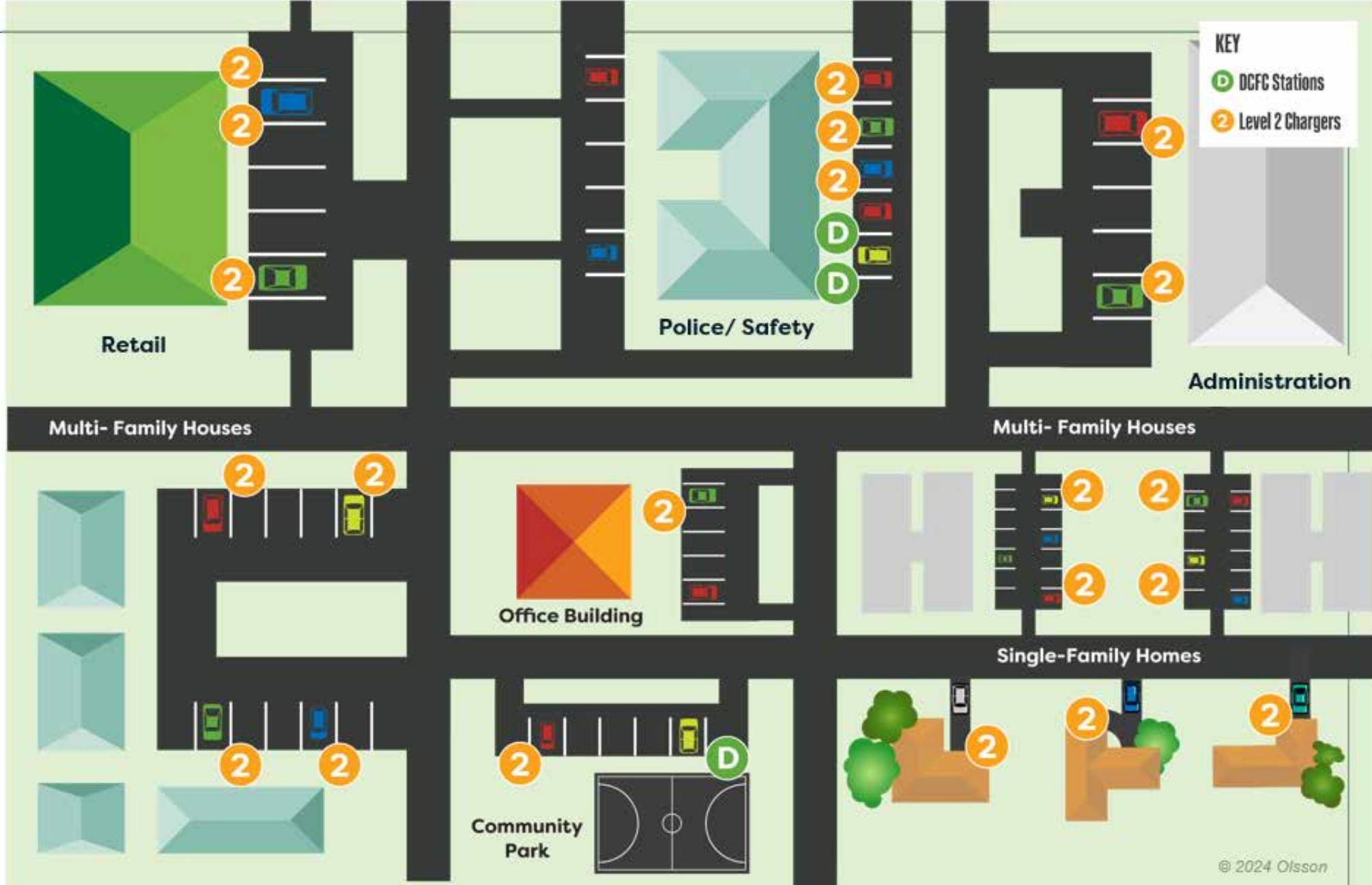


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Live Content Slide

Poll: How many Level II chargers can you add to an existing building service?

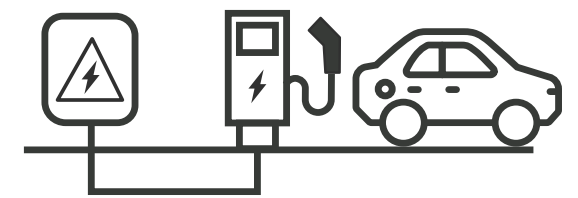
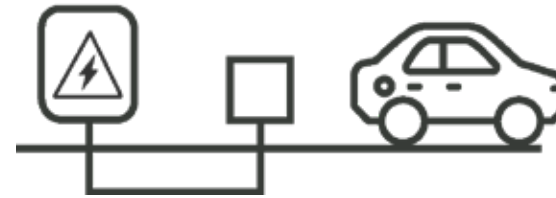
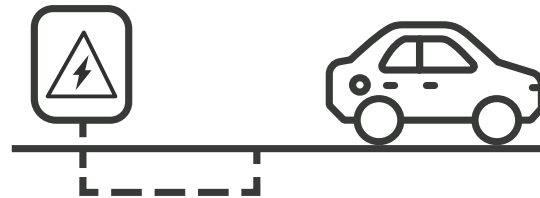
Site Layout



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Project Phasing – Make Ready

SITE REVIEW	EV CAPABLE	EV READY	EV INSTALLED
<ul style="list-style-type: none">§ Locate stalls§ Station specifications§ Electrical routing§ Utility capacity	<ul style="list-style-type: none">§ Utility connections§ Electrical equipment§ Trenching/ Boring§ Conduit installed	<ul style="list-style-type: none">§ Pads/ Bollards§ Wires pulled§ Panels/ Switchgear	<ul style="list-style-type: none">§ Station installed§ Commissioning§ Signage§ O&M Plan



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EV Charger Considerations

- Visibility for security of users and equipment
- Lighting levels
- Security cameras or site access controls
- Physical barriers for damage prevention
- ADA accessibility
- Proximity to power sources
- Wayfinding and signage



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VA Hospital Site Feasibility Study



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GSA Contract Details

- Design-Build IDIQ contract established in April 2022
- Prepare government real estate for transition to zero-emission vehicle fleets
- Streamline procurement of EVSE for federal agencies
- Support installation of EVSE at federal locations
- Wide range of A-E-C services available to federal agencies



VA Hospitals

- **Mission** - To fulfill President Lincoln's promise to care for those who have served in our nation's military and for their families, caregivers, and survivors.
- Over 8,000 facilities supported by diverse vehicle fleets
 - Patient transportation
 - Home based care
 - Operations and Maintenance
 - Employee travel

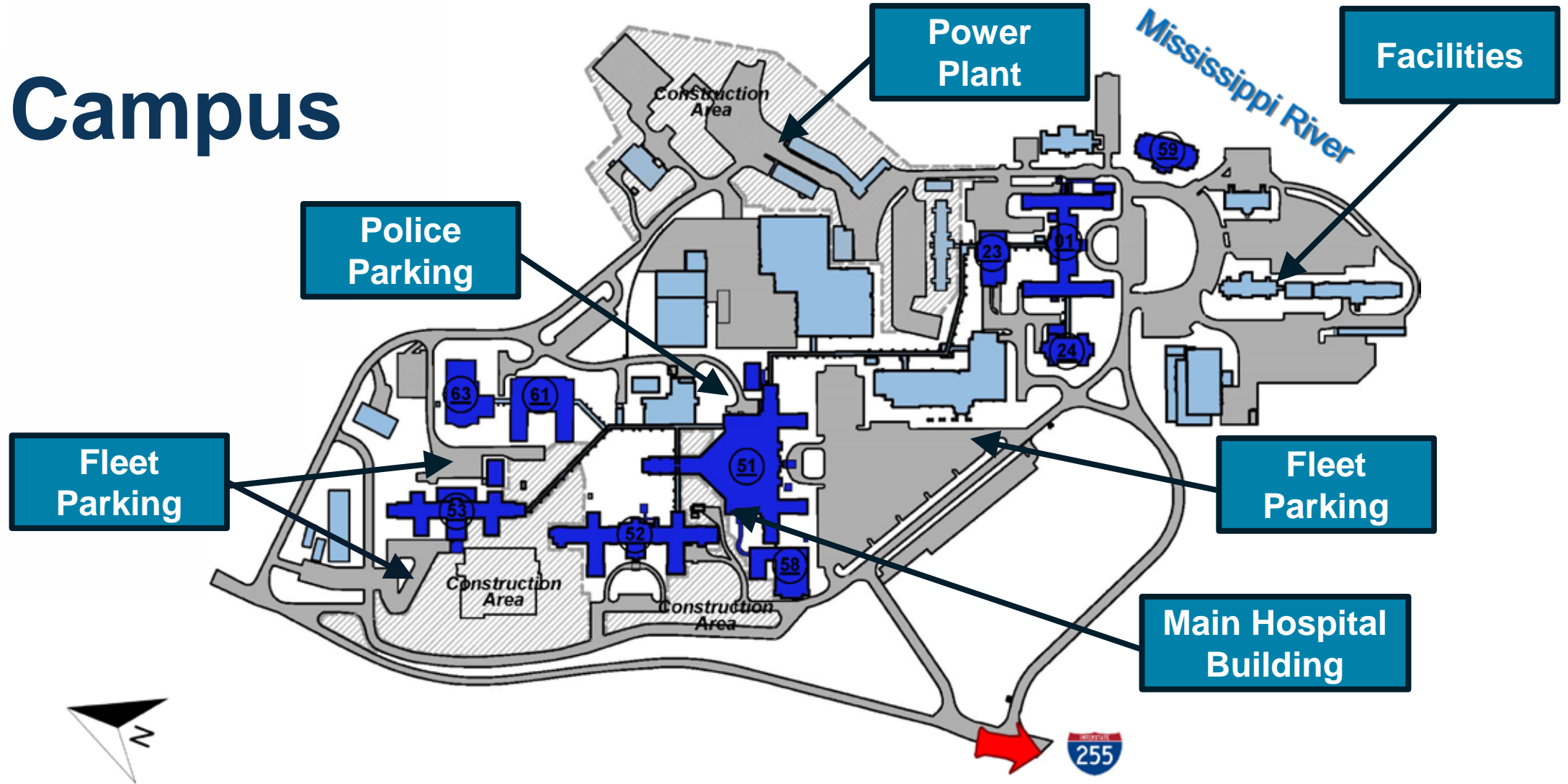
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Scope of VA study

- Total of 170 VA sites nationwide
- Collect fleet details, parking, and vehicle utilization trends
- Analyze and evaluate existing utility capacity
- Analyze and evaluate power distribution system condition and capacity
- Provide recommendations for phasing, preliminary SOWs, budget estimates, and life cycle cost analysis



VA Campus



Jefferson Barracks Division, 1 Jefferson Barracks Drive, St. Louis, MO 63125 314-652-4100 | 800-228-5459

<http://www.stlouis.va.gov>

Created by: W. Staas 05/2019

SOURCE: <https://www.va.gov/st-louis-health-care/locations/st-louis-va-medical-center-jefferson-barracks/campus-map/>



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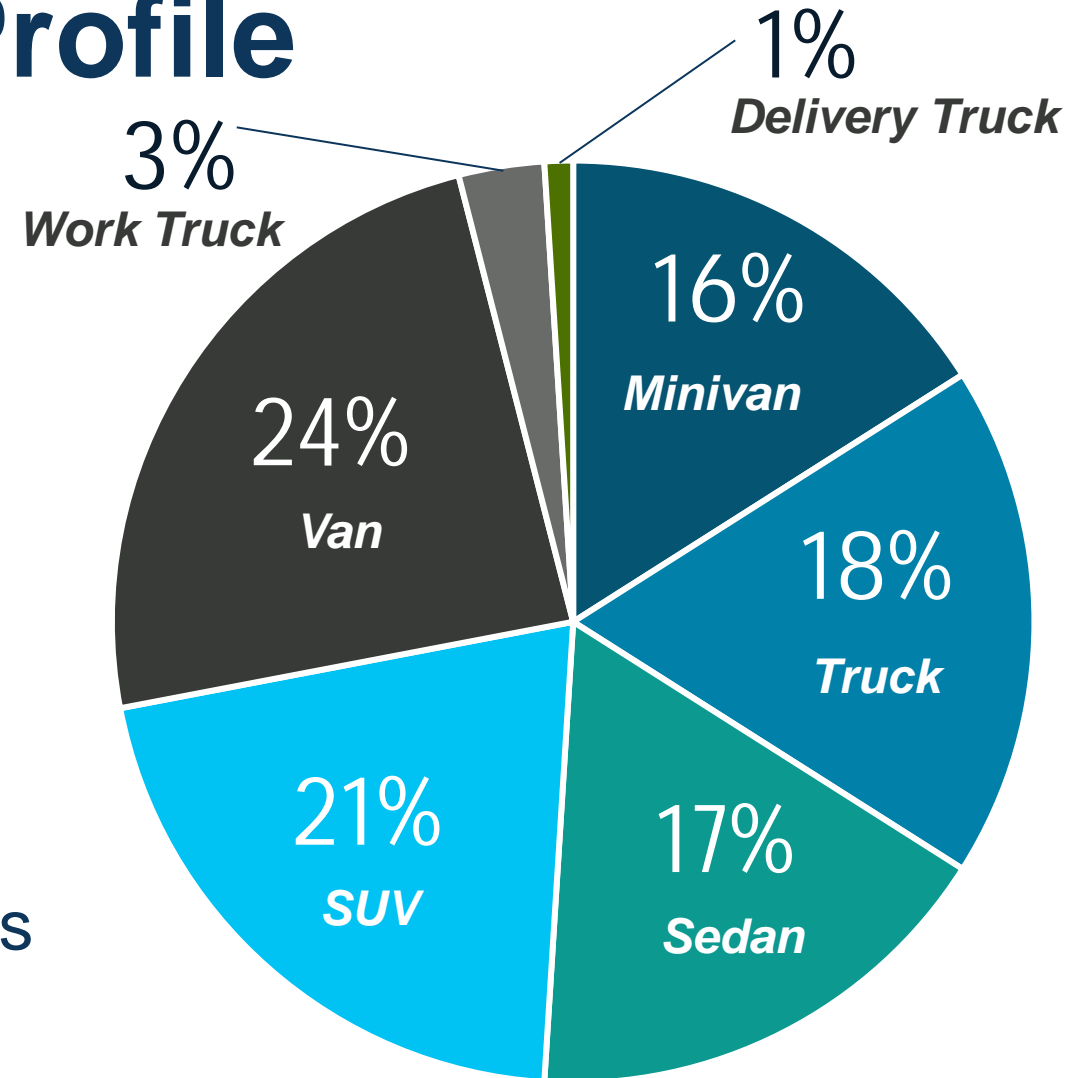


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VA Light Duty Fleet Profile



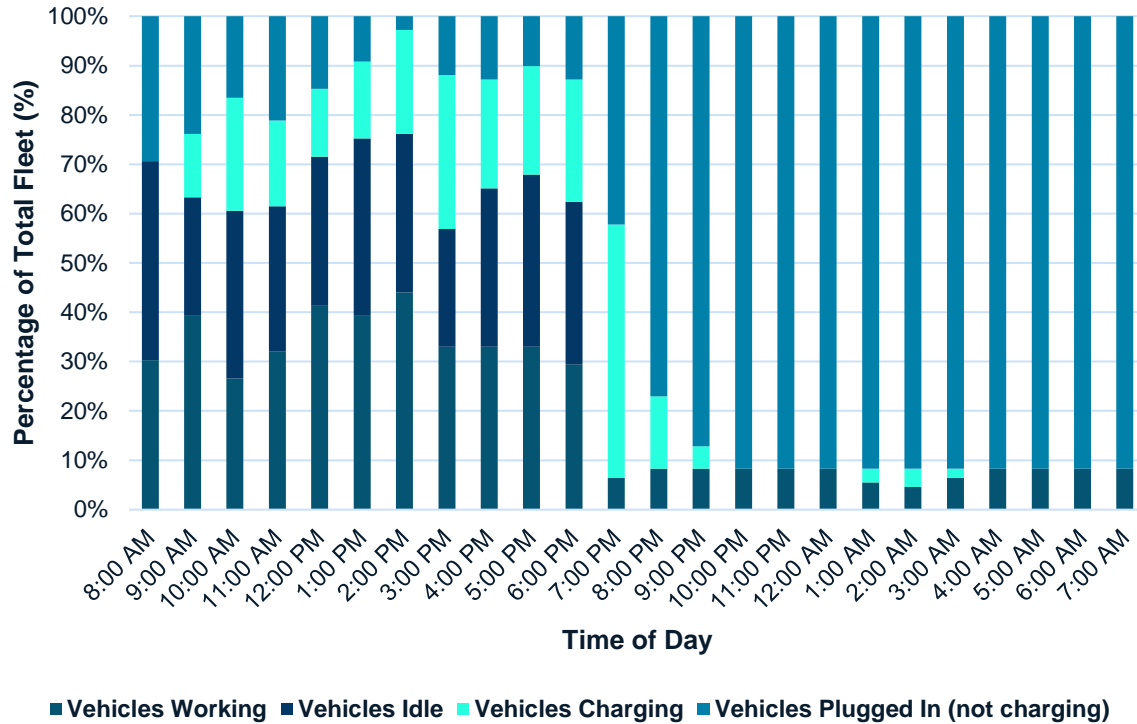
Vehicle Departments

- Transportation Services
- Engineering/ Facilities/ IT
- Housing
- Safety/ Police
- Logistics Services
- Community Based Outreach Clinics
- Pool Vehicles

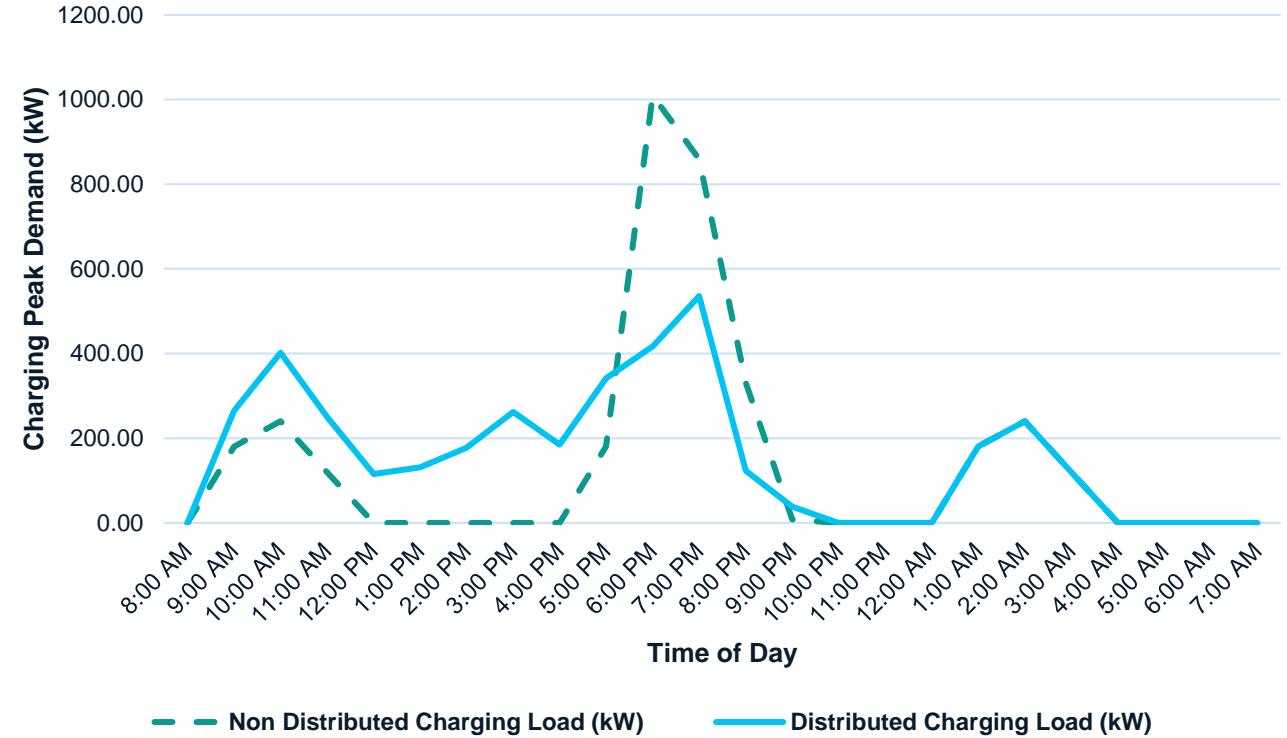
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Load Profile

Fleet Operational Profile Summary - Distributed Load



Charging Load Profile



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Typical Construction Options

Campus wide distributed charging:

- 1:1 vehicle to charging plugs
- Predominately Level 2 AC charging
- Vehicles return to assigned spots and charge overnight



Concentrated charging location:

- DC fast chargers
- Multiple vehicles use same stations
- Chargers fully utilized during work hours (8am-5pm)

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Final Report

- Site Narrative
- Utility Cost and Usage
- Facility Load Expansion
- Construction Cost Estimates
- Resiliency Considerations
- Panel Schedules
- One Line Diagrams
- Vehicle Charging Profiles
- Charging Load Profile

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Add Some Spark to Your Fleet

THANK YOU

Please take a few minutes to complete a short survey about this session. Your feedback will help us improve future programming for JETC.

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Q&A

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