

# City of Mesa EV Update

January 2022





# Content

- ICF Report Update
- Mesa Fleet Tool
- Blink replacements, new MCP and MAC chargers, WMSC & EMSC fleet service center projects, and the Master Plan
- Harmon Electric Assessments





## Climate Action Plan Goals, City of Mesa 2021

### ASPIRATIONAL GOAL #1: Carbon Neutrality

- Achieve carbon neutrality by **2050** by reducing greenhouse gas emissions and enhancing carbon sinks
- Strive to reduce the carbon footprint of City Operations by 50% by **2030**

### ASPIRATIONAL GOAL #2: Renewable Energy

- Prioritize the use of renewable, resilient energy to achieve 100 % renewable energy by **2050**

### ASPIRATIONAL GOAL #3: Materials Management

- Manage material responsibly and divert 90 % waste from the landfill by **2050**

### ASPIRATIONAL GOAL #4: Community Action

- Community development





- Transition City fleet to no and/or low-emission vehicles.
- Convert gasoline and diesel- powered powered equipment used by staff or City contractors, such as landscaping and construction equipment, to electric or low-emission fuels.
- Reduce employees' vehicle miles traveled during the workday through innovation.
- Reduce employees' commute to the workplace on High Pollution Advisory Days.
- Implement progress that support employees that use alternatives modes of transportation to reduce single occupancy employee commutes to and from workplace.
- Reduce vehicle miles traveled in single occupancy vehicles by expanding transit alternatives, like light rail, buses, paratransit, etc. Include an evaluation and implementation of alternatives that connect transit riders-doorstep to destination.
- Promote walkable conections to public facilities, parks, and neighborhood-level services.

# ICF Report

- Report sponsored by SRP as a part of their EV Rebate Program
- Study funded 50% by SRP

## City of Mesa Fleet Electrification Assessment

December 16, 2021

ICF on behalf of Salt River Project



Fleet advisory  
services provided by

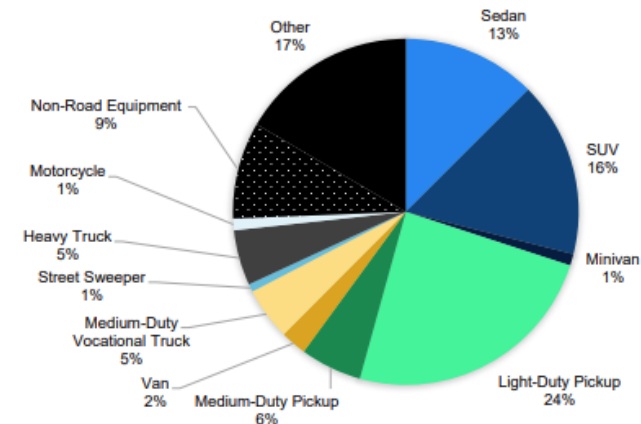


- Total Fleet Vehicles:1,932
- Active, On-Road Vehicles:1,757
- Available EV Equivalents:1,437
- Recommended for Conversion: 820
- Excluded from analysis: Fire Trucks, Rescue Trucks, Brush Track, CNG Light and Heavy-Duty vehicles

## Project Information

CITY OF MESA

CHART C. Existing Fleet - Vehicle Types





# ICF Report

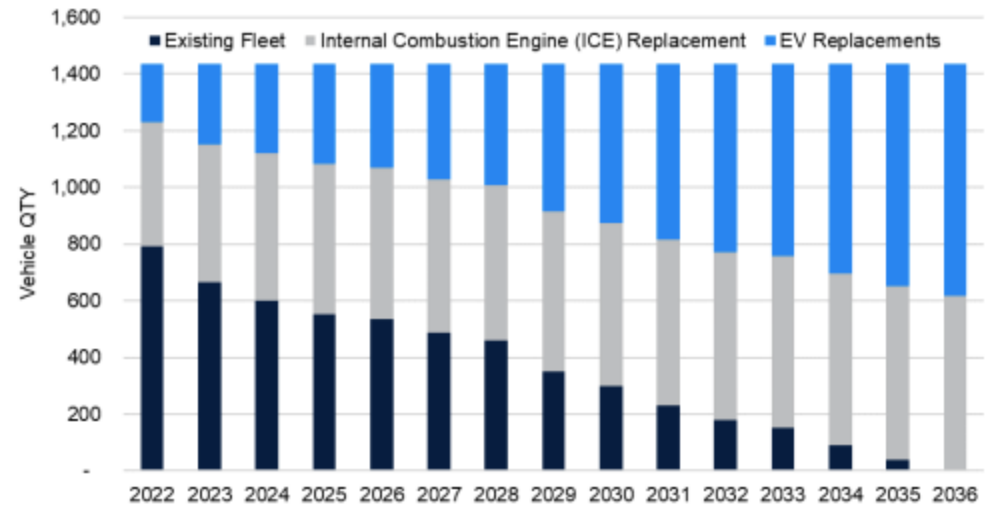
## City of Mesa Fleet Electrification Assessment

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CHART A. Recommended EV Replacement Timeline: Fuel Types

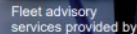


- The timeframe identified for the vehicle replacements is from 2022 to 2036, which accounts for a maximum vehicle life of 15 years.
- However, the fleet total cost of ownership (TCO) analysis extends to 2051 to account for the ongoing fuel and maintenance costs from the vehicles acquired in 2036.
- ICF assessed the economic feasibility of 1,932 vehicles in Mesa's fleet and identified 1,437 that have EV options available and 820 of those that would be beneficial to convert over the next 15 years.
- Chart A illustrates the phasing in of these EVs as the city replace existing fleet vehicles. These 820 vehicles would result in a net present value (NPV) TCO savings of \$40,464,466 over the next 30 years, which accounts for the savings across the vehicles' full lifespans.

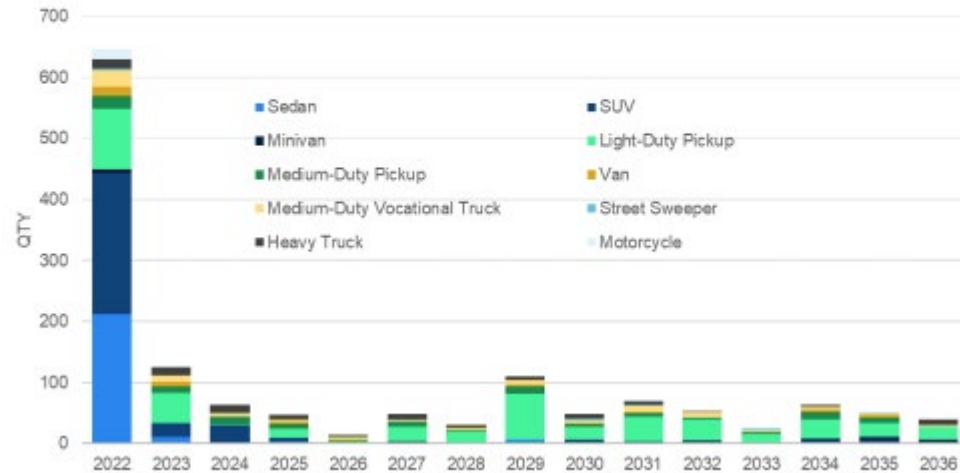
# City of Mesa

## Fleet Electrification Assessment

ICF on behalf of Salt River Project



- #### CHART D. Existing Fleet – Retirement Schedule



# ICF Report

- Chart E shows the Total Cost of Ownership (TCO) for the 820 recommended vehicles each year if they were replaced with conventional, ICE vehicles versus with the recommended EVs.
- So, if a vehicle is replaced in 2022, its full TCO is illustrated in the 2022 bar. Chart F below also shows this TCO result cumulatively.
- This timeline is based on the existing fleet retirement schedule outlined in Chart D above.
- While initial annual EV costs are higher than ICE costs, the overall cumulative EV TCO is lower due to incentives and reduced operational costs, as shown in Chart F.

CHART F. Fleet Recommended Replacements TCO Comparison - Cumulative

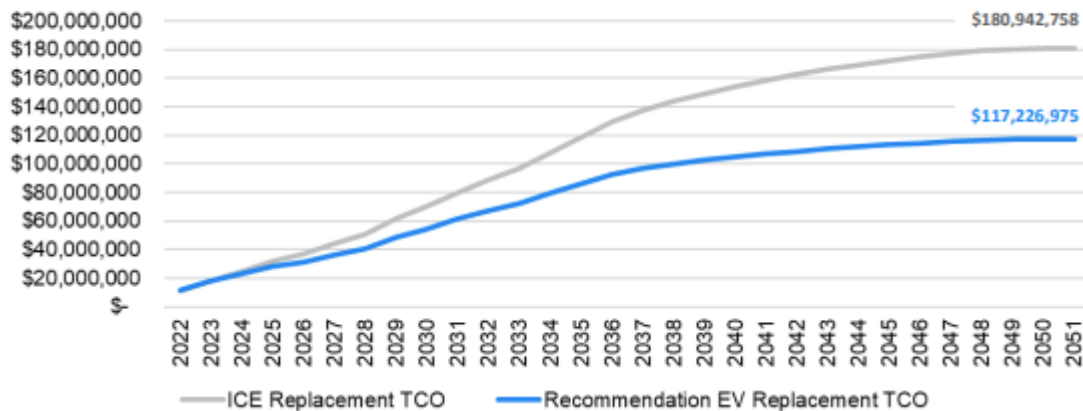
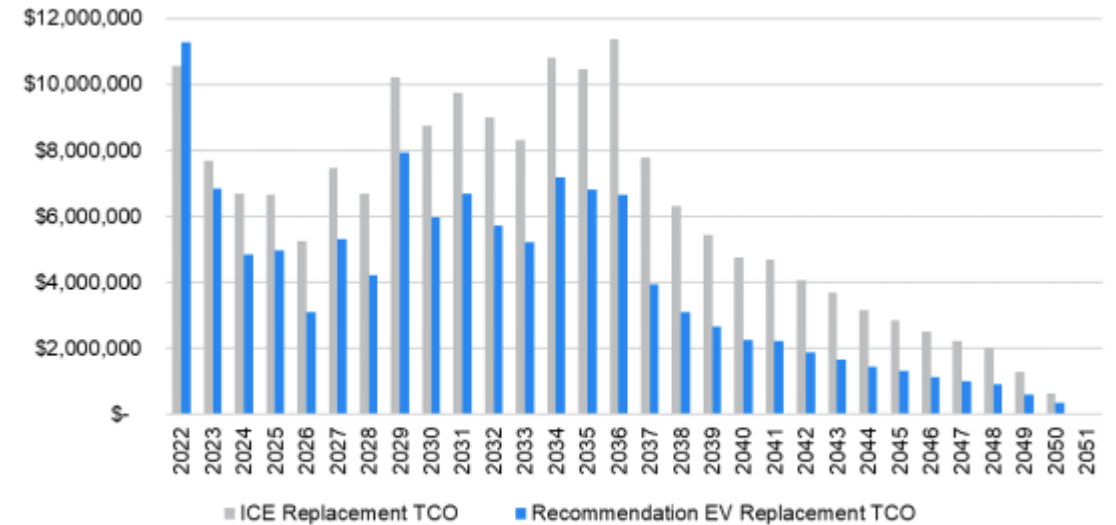


CHART E. Fleet Recommended Replacements TCO Comparison - Annual





# ICF Report

## City of Mesa Fleet Electrification Assessment

December 16, 2021

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Fleet advisory  
services provided by



Based on ICF analysis, converting 820 vehicles to EVs is estimated to produce the following impacts:

## Executive Summary

CITY OF MESA

Based on our analysis, converting 820 vehicles to EVs is estimated to produce the following impacts:



**\$40,464,466**

TCO savings over 30 years\*



**\$22,141,101**

fuel cost savings over 30 years\*



**\$26,508,721**

maintenance savings over 30 years\*



**114,929**

metric tons (MT) of CO<sub>2</sub> eliminated over 30 years

Over 30 years, those estimated CO<sub>2</sub> reductions equate to:



eliminating **13,217** homes' energy use for one year, or:



switching **4,367,303** incandescent lamps to LEDs, or:



recycling **39,076** tons of waste instead of landfilling it, or:



planting **1,896,329** trees.

\* NPV assumes a 5% discount rate

# ICF Report

- Charging Stations Recommendations:
- Mesa will need a maximum of 80 DCFC and 740 Level 2 chargers to support the recommended 820 EVs.
- This conservatively assumes a one-to-one charger-to-vehicle ratio and does not account for any existing chargers at Mesa's fleet facilities.
- While there are 32 base sites that house Mesa's vehicles, electric vehicle replacements will result in an estimated incremental 3,464 kW total power demand and 5,197,641 annual kWh across 28 Mesa sites, summarized in Table D below.
- Depending on the scheduled duty cycles of the vehicles, it may be possible to reduce the number of chargers.

## Site Assessment

Mesa will need a maximum of 80 DCFC and 740 Level 2 chargers to support the recommended 820 EVs. This conservatively assumes a one-to-one charger-to-vehicle ratio and does not account for any existing chargers at Mesa's fleet facilities. While there are 32 base sites that house Mesa's vehicles, electric vehicle replacements will result in an estimated incremental 3,464 kW total power demand and 5,197,641 annual kWh across 28 Mesa sites, summarized in Table D below. Depending on the scheduled duty cycles of the vehicles, it may be possible to reduce the number of chargers.

**TABLE D. Site Load Impact Study**

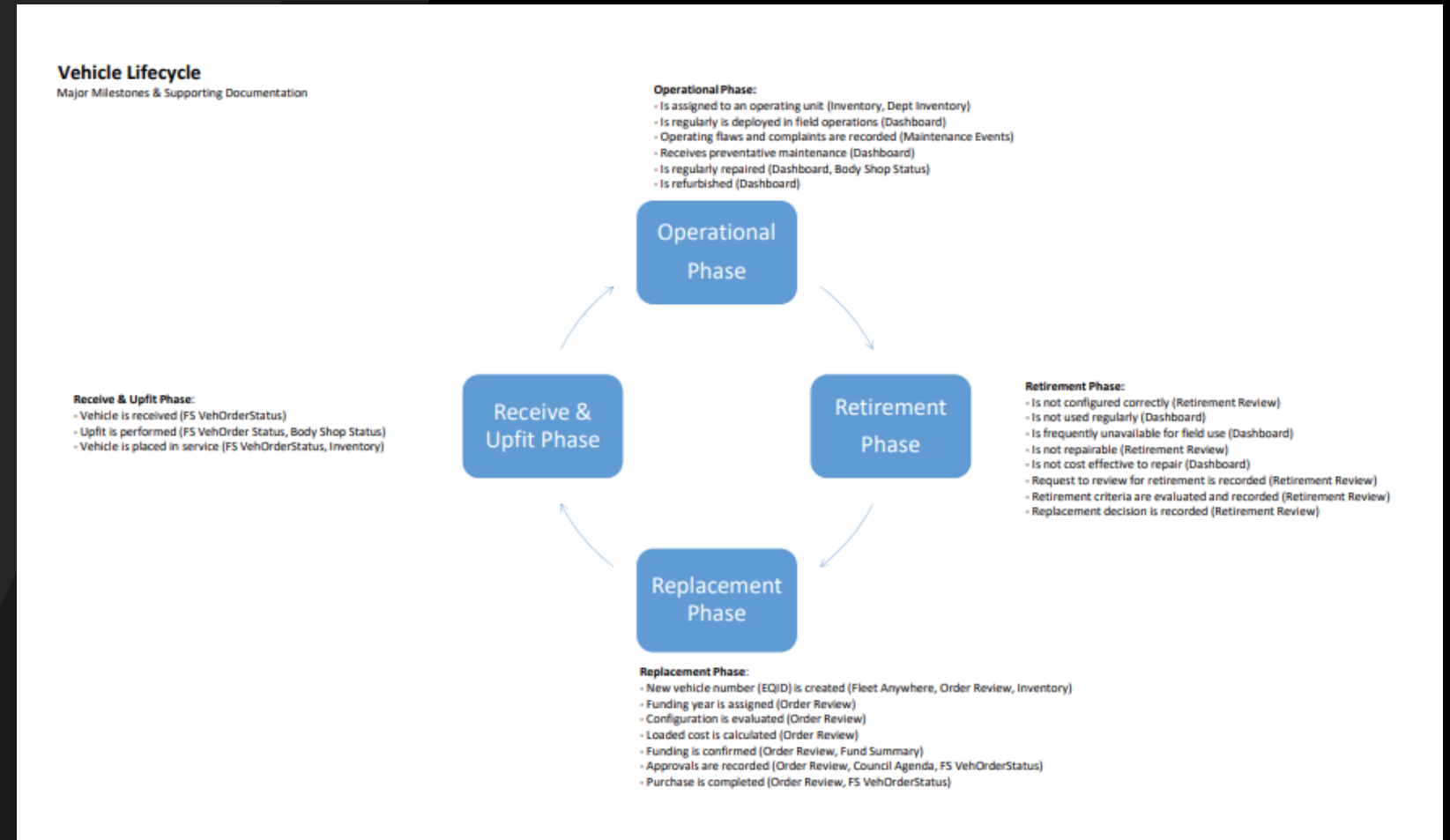
Charging Site	L2 (QTY)	DCFC (QTY)	Estimated Total Power Demand (kW)
Solid Waste Management Site	16	23	561
Transportation Site	103	12	533
Police Administration Site	148	3	483
Water Utility Site	113	8	412
Fire & Medical Site	31	14	343
Gas Utility Site	54	14	338
Parks Recreation and Community Facilities Site	75	1	221
Engineering Site	35	0	93
Electric Utility Site	18	3	88

Charging Site	L2 (QTY)	DCFC (QTY)	Estimated Total Power Demand (kW)
Development Services Site	30	0	81
Facilities Maintenance Site	29	0	75
Wastewater Utility Site	28	0	69
Animal Control Site	4	0	21
Fleet Services Site	7	0	18
Business Services Site	6	0	13
Fleet Services Motor Pool Site	8	0	11
Communications Site	5	0	11
Environmental and Sustainability Site	4	0	8
Falcon Field Airport Site	4	0	8
Information Technology Site	3	0	6
Housing and Community Development Site	2	0	5
Safety Services Site	3	0	4
Transit Services Site	1	0	2
Mesa Arts Center Site	3	0	2
Planning Site	1	0	1
Public Information and Communications Site	1	0	1
Neighborhood Outreach Site	1	0	0
Other Sites	7	2	54
<b>TOTAL</b>	<b>740</b>	<b>80</b>	<b>3,464</b>



# City of Mesa's Fleet Tool

- City of Mesa's Department of Transportation has its own fleet software.
- Vehicles in the city are considered for retirement when they become too expensive to maintain.
- Retirement of the vehicles is not based on age, there are many vehicles that are more than 15 years old but since they are barely used, they are still in good condition.



# Existing EV Charging Stations

Public charging (open and available to the public – fee based) – design work underway for EV charging:

- 8 existing Blinks stations (MAC, Library, and Convention Center) will be upgraded with next generation technology
- 3 new Blinks stations will be added at the Mesa Arts Center for a total of
- 6 EV charging stations at the MAC
- 2 new EV stations will be installed at Mesa City Plaza Building
- ECO Mesa developer is installing conduit for additional public charging stations

Mesa Library Blink EV Charging Stations (3)



Mesa Arts Center Blink EV Charging Stations (3)



West Pepper Parking Lot Blink EV Charging Stations (3)



EV Charging Stations (2)





# Fleet EV Charging



Design work and master planning underway:

- Design work for 16 new EV charging stations at the West Mesa Service Center and East Mesa Service Center is underway:
1. West Mesa Service Center – 8 EV chargers (7 Level 2 chargers and 1 DC fast charger)
  2. East Mesa Service Center – 8 EV chargers (7 Level 2 chargers and 1 DC fast charger)
  3. Charging stations for Fire Fleet at 708 W Baseline is in the planning stage

The following sites have been assessed for EV charging, including assessment of electric supply conditions, user needs and prepared preliminary estimates and diagrams for charger installations:

300 E 6th Street – 4 chargers, 2 Level 2 dual chargers

340 N Mesa Dr – 8 chargers, 4 Level 2 dual chargers

340 E 6th Street – 8 chargers, 4 Level 2 dual chargers

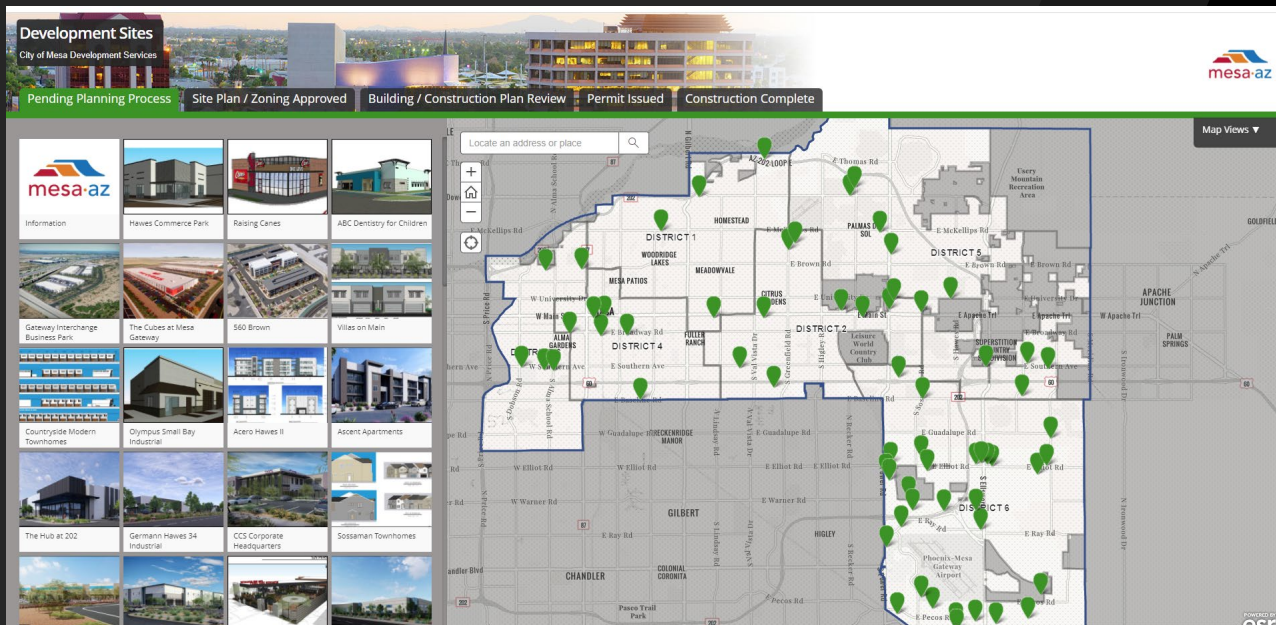
PD CID Central

PD Fiesta

Centennial Garage – 8 chargers, 4 Level 2 dual chargers

Pepper Place Garage – 8 chargers, 4 Level 2 dual chargers

# Master Plan



- Document the big picture (current and future needs) and evaluate existing electric infrastructure details so we can prioritize EV infrastructure deployment in a rational and cost-effective way
- Employee charging – study underway:
- Study feasibility– installing infrastructure that allows employees to charge while at work
- Collaboration with Energy Resources – pairing new solar shade canopies with new EV charging infrastructure in the downtown area



# Vehicle Replacements



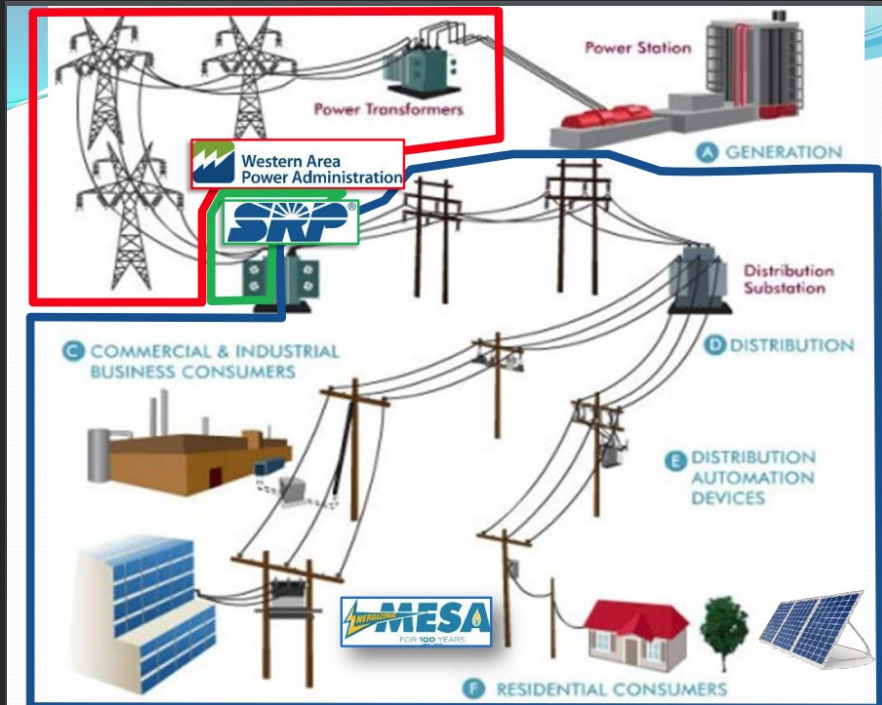
- Collaboration with Fleet on transition to EVs Vehicle Assessment.
- Fire and Medical purchased the first electric fire truck.
- Fleet Services has 2 Plug in Hybrid Vehicles (PHEV) in the Fleet .
- Fleet Services reserved 28 electric F-150 Lightning pick-up trucks, which are tentatively scheduled to be delivered to Fleet Services in Oct. 2022.
- PRCF Park Rangers have committed to purchasing Lightnings to replace trucks that have reached the end of their useful life.
- Environmental is committed to replacing 2, vintage ~199X, trucks with 2 electric Lightnings.
- PD Commanders and MFMD Battalion Chiefs are committed to purchasing EV for their operations.
- Fire Fleet is committed to purchasing EVs for their operation.

# Harmon Electric Assessments

- So far, we have completed 13 Site assessments.
- They range \$20,000-\$115,000 depending on site.
- Assessments include:

Electrical Equipment & Material to be installed:

1. EMT conduit installed from electrical room to roof and along/down to grade of building
2. PVC conduit below grade from corner of building to charging equipment location
3. Purchase and install new step-down transformer
4. Purchase and install new Cutler Hammer 200A panel
5. New breakers to feed panel (4) 40A 2-pole breakers
6. Wire, couplings and connectors from existing panel to EV charging locations
7. Site Inclusions Safety Bollards Permitting and Engineering City Inspection 2-year Harmon Labor Warranty Initial Site Testing/Activation
8. Exclusions EVSE (Chargers, Pedestals) and any network services Wheel Stops Striping, Signage Civil Scope (Asphalt modifications, concrete removal/repairs)



Thank You!

