

## Emerging Technologies





# Agenda

- **Fleet Executive Overview**
- **Fleet Mobility Strategy**
- **Fleet Services Update**
- **Austin Energy Update**
- **Capital Metro Update**
- **Programs and Market Conditions**
- **Next Steps**



## Fleet Services: Mobility Strategy

Fleet Services Mobility strategy is to lead, design and incorporate "**Sharing, Electric vehicles, Telematics, and Autonomous Mobility Services**" for City employees by providing cost effective, accessible forms of modality to transport City employees, tools and equipment to conduct the business of the City. The primary goals are to reduce transportation costs, traffic congestion and under-utilized fleet assets while improving the health, environment, safety and livability of Austin

### Fleet Mobility Policy

- City vehicle travel use prioritization policy to align with mobility strategy

### Alternative Fuels

- **Fleet Electrification 330 by 2020**
- Biodiesel, CNG, Propane, E85
- Renewable diesel

### Connected Vehicle Program

- GPS and advanced telematics FY20
- Savings in safety, fuel, maintenance and productivity

### Fleet Optimization Program

- Improve ROI during useful life
- Tailored optimization strategy for each department

### Drive High Utilization Rates

- High VMT/vehicle increases ROI and lowers cost per mile
- Reduced under-utilized fleet

### Sharing Programs

- Employee shuttle program
- Employee ride sharing public, private partnerships

### Use of Central Rental Pool

- Lower fleet asset investment; economies of scale
- Shared use among Departments

### Grant Opportunities

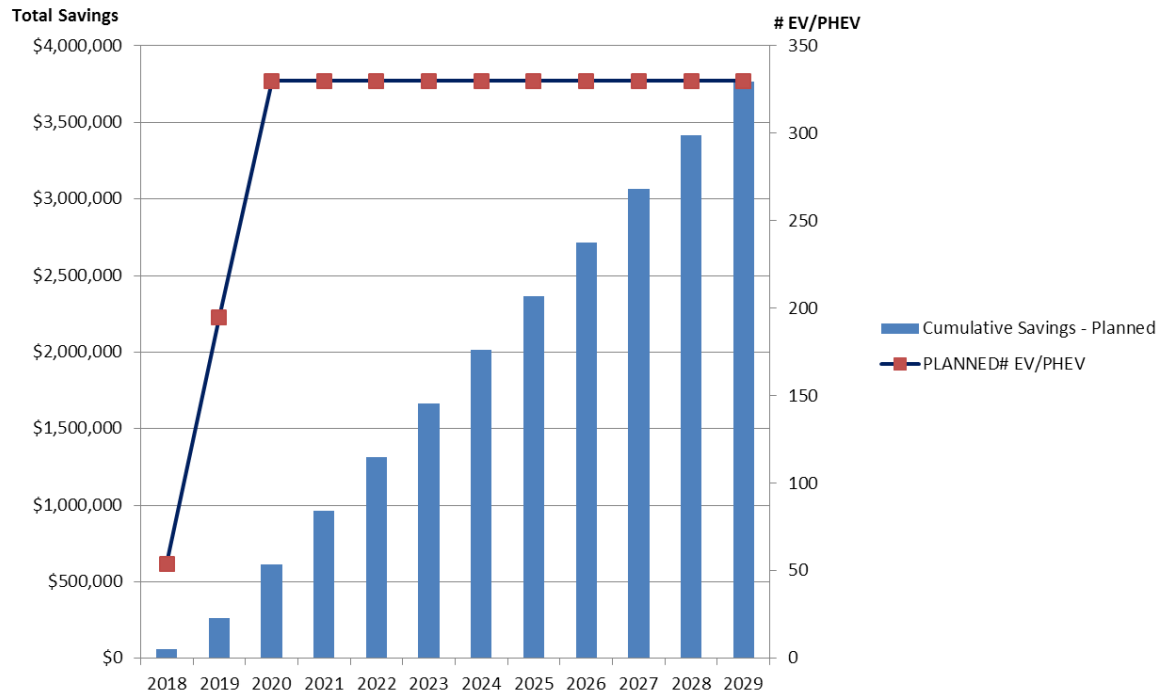
- VW Settlement – TCEQ Grant
- CNG Expansion – TCEQ Grant
- Biodiesel Expansion – TCEQ Grant

# FLEET ELECTRIFICATION

# Fleet Electrification Analysis and Plan - \$3.5M Savings 10 years

- In 2016 Council passed a resolution to assess opportunities to electrify the COA fleet in response to a Smart Cities Challenge
- Recommendations:
  - Replacement of 330 gas powered vehicles with EV and PHEV vehicles
  - Expand charging station infrastructure as needed
  - Fund charging infrastructure through interdepartmental fuel surcharge

Annual Operating Cost Savings - 330 EV/PHEV vehicles



# Fleet Services: Electrification and Charging Infrastructure

## SCOPE / OBJECTIVE

### Objective: Fleet Electrification and Charging Infrastructure Buildout

- In 2016 Council passed a resolution to assess opportunities to electrify the COA fleet in response to a Smart Cities Challenge
- Carbon neutrality for City of Austin operations by 2020
- Net-zero community-wide greenhouse gases by 2050
- By 2020 replacement of 330 gas powered vehicles with EV and PHEV vehicles

### Recommendations:

- Replacement of 330 gas powered vehicles with EV and PHEV vehicles
- Expand charging station infrastructure as needed
- Fund charging infrastructure through interdepartmental fuel surcharge

## DEPARTMENT / SAVINGS

### Sponsoring Department: Fleet Services and Austin Energy

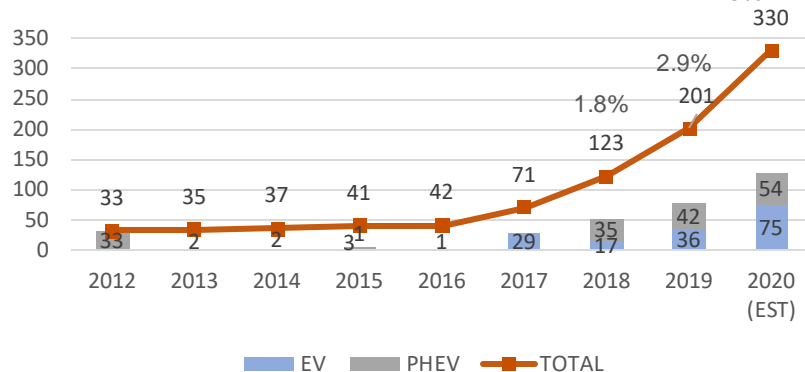
- Executive Sponsor: Jennifer Walls, Jacqueline Sargent
- Project Team Leadership: Karl Popham, Cameron Freberg, Will O'Connor
- Project Managers: Yuejiao Liu PWD, Darlene Berghammer AE

### Savings Opportunity:

- \$3.5M over 10 Years
- CO2 Reduction 1,250 metric tons of CO2 emissions per year

## STATUS / METRICS

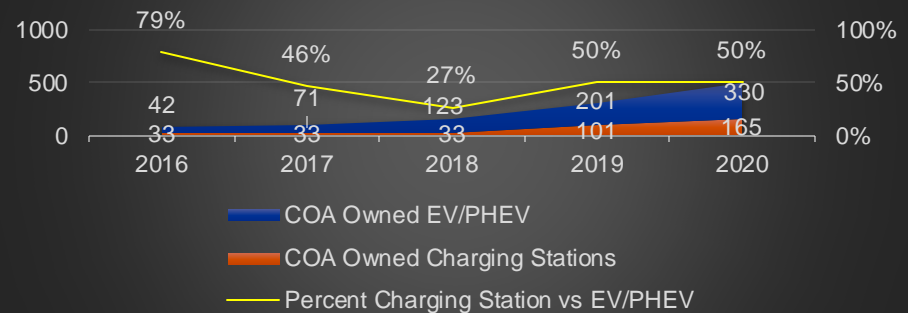
### EV/PHEV ACQUISITIONS 2012 - 2020



- 2019: 71 EV/PHEV purchases
- 2020: 129 EV/PHEV remaining purchases
- Annual CO2 Emissions offset 1,250 metric tons

## STATUS / METRICS

### Charging Infrastructure



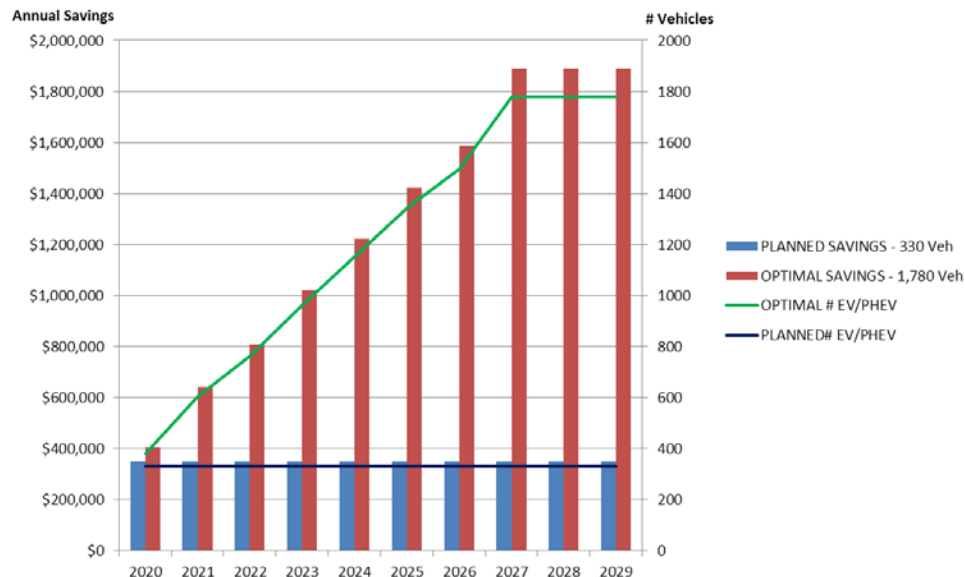
- 2019 – 101 Charging stations required to be at 2/1 ratio
- Charging equipment is on site
- Contractor has been ChargePoint Certified



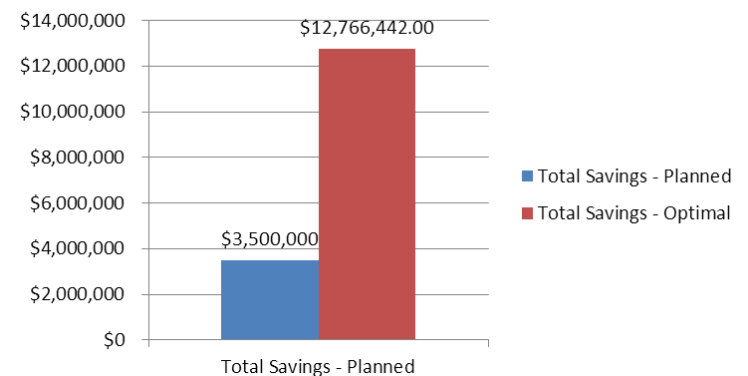
### Fleet Electrification Plan: Light Duty Potential

- Current fleet size is 6,652 units; Light Duty size is 2,213 or 33%
- An estimated 1,780 Light Duty units could potentially be replaced with EV/PHEV as a part of the normal replacement cycle over next 10 years
- Light Duty EV/PHEV sedans and SUVs are available today for purchase, viable options for pickups and vans are expected to be available starting in 2021 or sooner
- Potential for much higher operational cost savings over next 10 years – up to \$12.8M cumulative

EV/PHEV Annual Operating Cost Savings



10 Yr Operating Cost Savings Comparison



# ***City Fleet Charging Infrastructure***

- Level 2 charging stations at City of Austin facilities to support fleet vehicle charging

## **FY19: 21 Sites Identified**

- Up to 35 DC (Direct Current) publicly available fast chargers thru FY20 will supplement depot charging
- New EV Fleet Infrastructure Rebate Pilot being developed to encourage electrification of non-city fleets



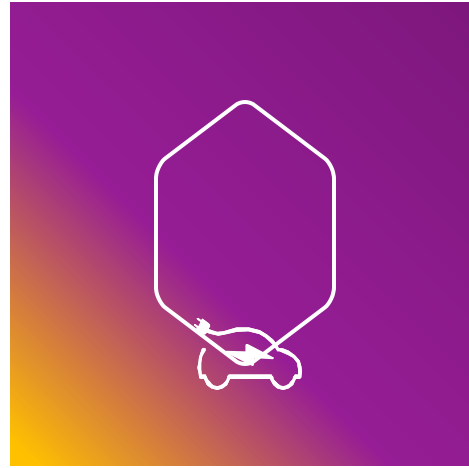


# Capital Metro Charging Infrastructure

- Former Serta warehouse on McNeil drive to become electric bus charging depot
- 60 kW DC fast chargers to fuel electric buses
- Transportation Electrification Rate Design
- Infrastructure Planning

200

Capital Metro buses to be converted to electric



### **Climate Mayors Council**

- City of Austin is working with the Climate Mayors Council and the Electrification Coalition which are a national organization of cities and private enterprise that are leading the EV transition to improve equitable access to EVs for all cities and influence vehicle market to meet cities' needs

### **Status:**

- The **City of Austin led by Mayor Adler, Fleet Services and the Office of Sustainability** has joined 19 cities and 2 counties as a founding member of the Climate Mayors Electric Vehicle Purchasing Cooperative to reduce acquisition costs, lower green house gas emissions and promote the use of EV/PHEV vehicles
- The City of Austin has committed to purchasing 71 (18%) out of a total 376 EV/PHEV's in FY19 and another 129 in FY20 for an average savings of over \$1,300 per EV/PHEV

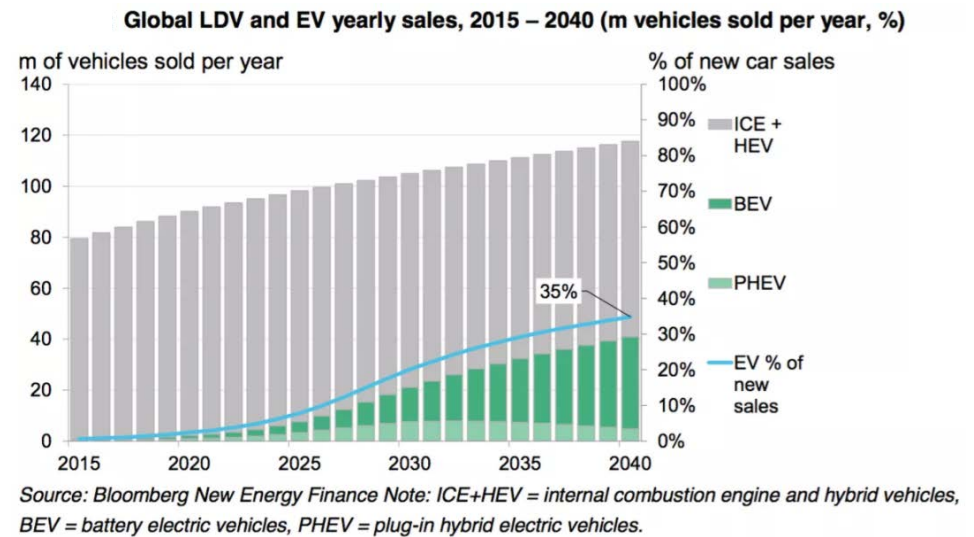
### **Building Strong Relationships:**

- OEMs
- Charging station manufacturers/installers
- Fleet service providers
- Regional Councils of Government
- City, State, Federal Government Fleet organizations



### City of Austin EV Purchases Pacing Ahead of Market

- Market: EV / PHEV Sales are up greater than 25% year over year but are only 1.1 % of total vehicle sales
- COA Fleet: 2019 purchases are at 11.4% (71) units of the total fleet purchases (624)
- EV / PHEV will represent close to 25% of all vehicle sales in the next 10 years



## Fleet Services: Electric Vehicle Test Drive

Fleet Conducted a Ride and Drive with the City Manager and Directors Summer 2018

**AUSTIN CITY MANAGER SPENCER CRONK TOOK ONE OF OUR 100% ELECTRIC BOLTS FOR A TEST DRIVE**





## Fleet Services: Electric Vehicles



# *Fleet Services: The Future of Fleet Electrification*

## **Opportunities of Fleet Electrification**

- The cost of EV/PHEV will likely decrease each year moving forward
- EV/PHEV expansion into the light and heavy duty fleet segment
- Improved Battery life
- Improved travel distance on a single charge
- Significant expansion of charging infrastructure
- Reduction in charge time as DC Fast charging expands – becoming more similar to regular fueling
- EV batteries and power storage management becoming bi-directional and having the ability to push unused power back to the grid

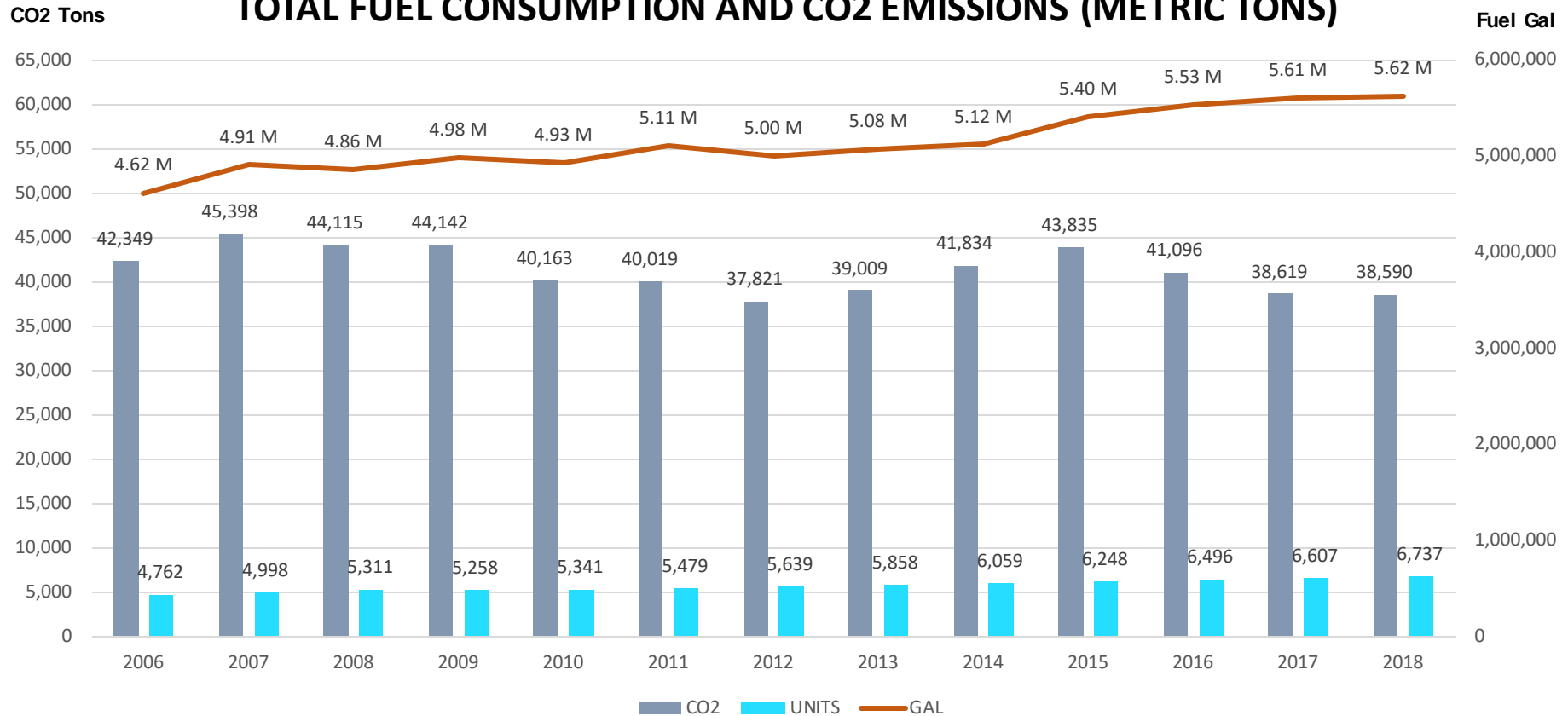
## **Challenges of Fleet Electrification**

- Department culture change management (range anxiety)
- Charging station infrastructure build rate
- Fast charge strategic placement
- OEM build of the truck segment and heavy duty equipment
- Maintenance Technician Training
- Monitor/maximize EV utilization, charging patterns, project cost / economics

Questions?

## APPENDIX : CO2 EMISSIONS

### TOTAL FUEL CONSUMPTION AND CO2 EMISSIONS (METRIC TONS)



- Fleet size has grown 41% or 1,975 units since 2006
- Fuel usage has increased 22% or about 1 million gallons
- Overall carbon emissions lower by 15% or 6,808 metric tons by using low-carbon alternative fuels