# Resiliency in a Zero-Emission World

Amy Hance | City of Clovis

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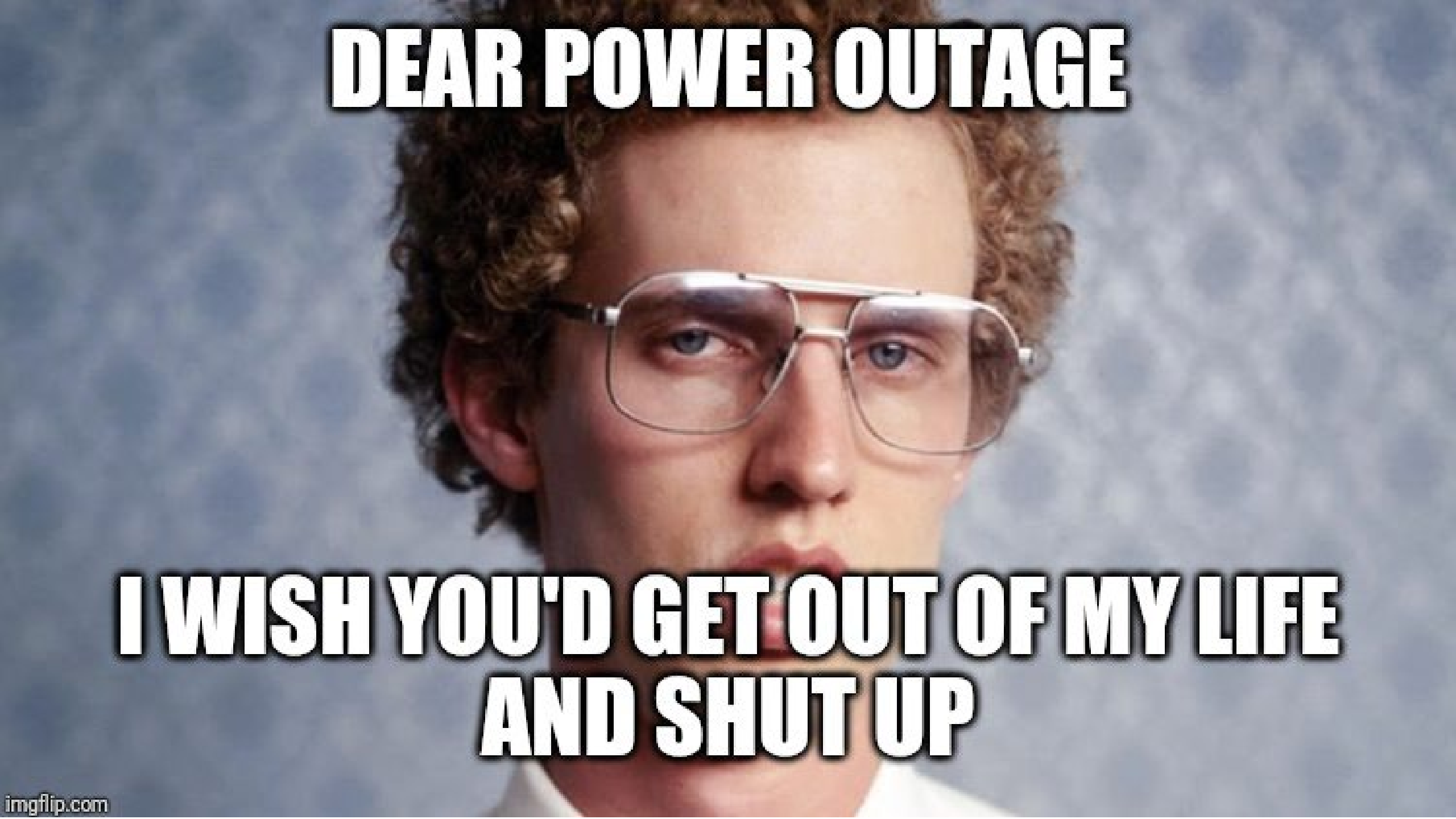
DEAR POWER OUTAGE
I WISH YOU'D GET OUT OF MY LIFE
AND SHUT UP
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# Clovis Transit


# What is Resiliency?

The capacity to withstand or to recover quickly from difficulties, toughness.

The ability to continue operations without impact from disruption of a power supply.

# Planning is Critical

## Power Outages

### Outage Types

1. **Unplanned –** car pole, contractor dig in, equipment failure, lightning strike, etc.
2. **Planned –** equipment upgrades, new customer connections, planned 3rd party maintenance
3. **PSPS –** Public Safety Power Shutoff

### Outage Durations

1. **Momentary –** usually not more than a few seconds.
2. **Sustained –** usually minutes or hours, but could last for days depending on the work needed.

Bottom line – PG&E cannot guarantee that your power will not be interrupted, and always recommends having a operational plan during power outages.

# Resiliency Goals

- Protect fleet operations from small disruptions through robust infrastructure.
- Maintain fleet operations during a moderate disruption through redundant systems.
- Return to full operations as quickly as possible after severe disruption.
- Mitigate or minimize damage through resourcefulness.

# Clovis Transit ZEV Pilot Project

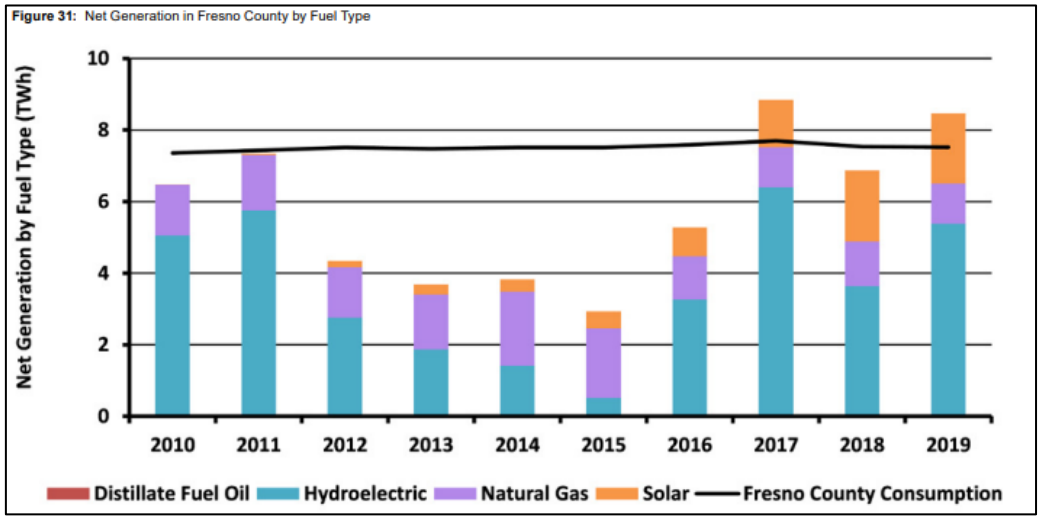

# Where to Install?

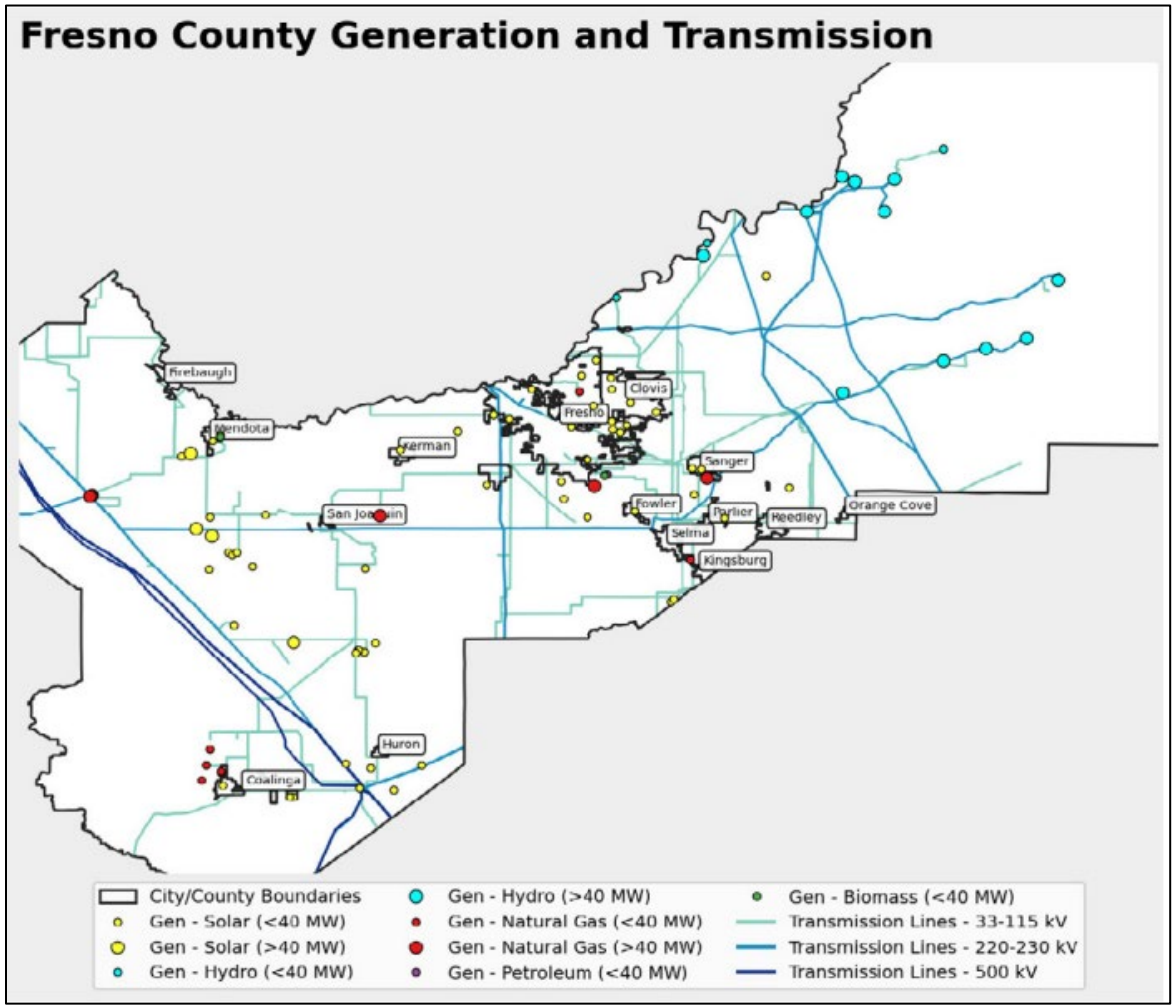
- Clovis Transit shares space with other city commercial vehicles and departments.
- Assessment performed by outside electrical engineer.
- PG&E confirmed available space in transformer.
- Plans were drawn for installation.
- Chargers were installed and energized.

# Let the Large-Scale Planning Begin

- Review public data on local energy assets and constraints
- **Early utility engagement to determine loads available**
- Evaluation of utility reliability and value of resilience
- Energy bill review and future tariff analysis
- Interconnection agreements for on site power generation
- Detailed design of on-site power generation

# Understanding Your Power Options



# Understanding Your Power Options

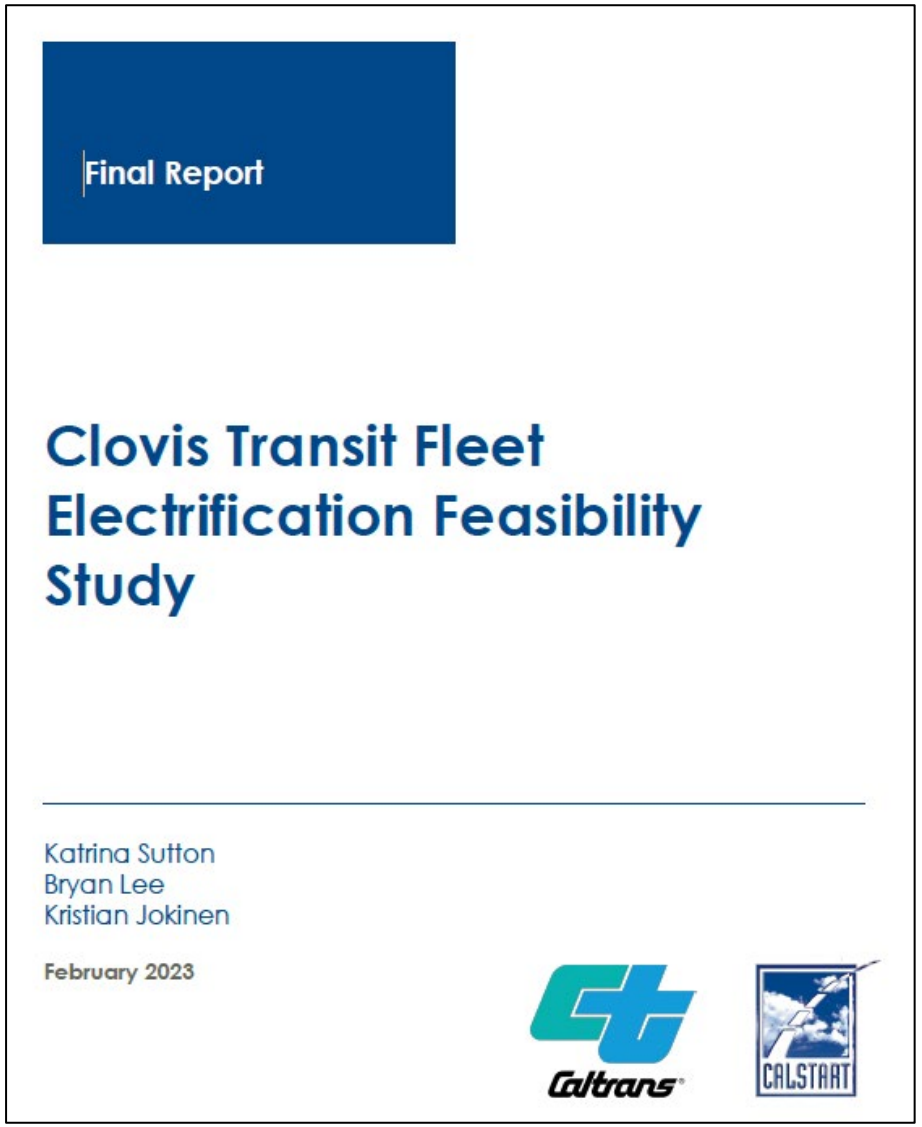
CALIFORNIA
AIR RESOURCES BOARD

FACT SHEET

## Innovative Clean Transit (ICT) Regulation

April 2019

**What is the ICT regulation and to whom does it apply?**
The ICT regulation was adopted in December 2018 and requires all public transit agencies to gradually transition to a 100 percent zero-emission bus (ZEB) fleet. Beginning in 2029, 100% of new purchases by transit agencies must be ZEBs, with a goal for full transition by 2040. It applies to all transit agencies that own, operate, or lease buses with a gross vehicle weight rating (GVWR) greater than 14,000 lbs. It includes standard, articulated, over-the-road, double-decker, and cutaway buses.



Final Report

## Clovis Transit Fleet Electrification Feasibility Study

Katrina Sutton
Bryan Lee
Kristian Jokinen

February 2023

Caltrans

CALSTART

# Understanding Your Power Options


# First Task – Connect with Power Provider

- Long term forecasts (5+ years out)
  - Information from customer-base long-term forecast is essential for IOUs to consider in their long-term planning along with other forecasts (such the IEPR)
  - This information will allow IOUs to determine needs for large system upgrades (such as new substations)
- Short term forecasts (2-5 years)
  - It is extremely important that customers inform IOUs as early as possible of the development of customer projects
  - Certain areas of distribution grid are constrained and distribution upgrades will be needed to support these projects
  - At this range (2-5 years), IOUs would be able to insert small to medium distribution upgrades in their DPPs to support customer need
- Excessive short time (<2 years) of new load requests
  - This should not be practiced as this will likely not give IOUs time to develop the system upgrade to meet the customer needs

# Strategies For Resiliency

## Prioritize Assets

Assets should be prioritized based on mission criticality and lack of alternative means to complete that mission. Key fleet assets should be designated within agency resilience planning efforts and prioritized for diversifying their fuel sources as appropriate such as using dual-fuel vehicles, physically securing vehicles in locations protected from hazards, determining level of use by capturing real-time data on those assets through telematics or other means, and accounting for likely changes during disruptive events. Asset prioritization should extend beyond vehicles, to fueling centers, parking structures, and transportation structures. For example, if high priority vehicles are dependent on insecure fueling centers, then fleets can improve resilience by installing their own fueling equipment.

# Strategies For Resiliency

## Increase Fleet Operations Flexibility

Increasing fleet flexibility involves seeking alternatives to specific fleet vehicles to meet mission requirements and reallocation of fleet assets to areas of need. This also may be coordination with other agency fleets that operate in the same region. Identifying existing transportation modes outside of the fleet can improve continuity. This may include other public transportation or transportation network companies (TNC) for passenger service. Coordination with other agencies and regional organizations can result in benefits to all parties.

# Strategies For Resiliency

## Protect Fleet Assets – Fuel, Vehicles, & Infrastructure

Hazards such as flooding, wind damage, and seismic events are primary threats to fueling stations, vehicles, and infrastructure. Ensure facilities follow the latest flood protection building codes, raise elevation of existing fueling stations where possible, wrap or raise electrical support equipment, secure above ground storage tanks to avoid movement during extreme weather, and construct floodwalls around facilities. Resilience planning should include considerations for logistical hurdles such as ingress and egress restrictions for agency and support personnel to access both onsite and offsite secured fueling infrastructure. Vehicles can be damaged or rendered inoperable during emergencies. Ensure that vehicles are parked appropriately, in areas that are secure, particularly when disruptions are anticipated. These locations may include high ground in flood zones or garages for other hazards. Electric power is needed for fueling stations to operate and can be affected by numerous hazards. Bury or reinforce powerlines or install protected onsite energy generation with energy storage systems. Onsite generators at fueling stations and charging sites are frequently the solution to providing electric power in times of grid power outages. Generators most often operate on diesel or natural gas so secure supply contracts to maintain fuel delivery during emergency.

# Strategies For Resiliency

## Incorporate Fleet Fuel Diversification

Incorporating alternative fuel vehicle vehicles in the fleet increases fueling options for fleets and can help to alleviate fueling supply constraints. Individual site fuel support varies as well and should be considered during resilience planning. Certain sites have access to multiple electrical distribution feeders or natural gas pipeline feeds, and others have multiple avenues of entry for petroleum or propane tankers. Individual site fuel support varies as well and should be considered during resilience planning. Certain sites have access to multiple electrical distribution feeders or natural gas pipeline feeds, and others have multiple avenues of entry for petroleum or propane tankers.

# Strategies For Resiliency

## Integrate Fleet Planning in Agency Resilience Efforts

Fleets interact with broader agency missions and are directly tied to facilities through fueling and garages in many cases. In some instances, fleets may play a direct role in facilities maintenance. Secure facility access to electricity, natural gas, and other fuels may be necessary to ensure fleet continuity. Managers may need to coordinate internally with leadership to set up continuity transportation plans for staff to access and navigate the site in case of an event. These plans could include transportation services such as shuttles and route alternatives in case of damaged transportation infrastructure such as bridges and roadways. Most importantly, facility resilience planning efforts are more common than parallel fleet efforts. Fleet managers can learn from their energy manager counterparts and build on their continuity structures and resilience planning efforts. Integrating fleets into holistic planning can thus ensure a more robust and effective planning process.

# Resources

Federal Fleet Resilience Planning Guide

CARB Transit Infrastructure Working Group for ZEB

Fresno County Rural Transit Grid Analysis Study

US Dept. of Energy Enhancing Grid Resilience Using EVs

Thank you!

Amy Hance
City of Clovis
(559) 324-2769
amyh@cityofclovis.com