



Accessible EV Mobility & Infrastructure For All



# Fresno County Rural Transit Agency

## Microgrid/Resiliency Hub Feasibility Study

Advisory Committee Meeting, June 20, 2024



WALKER  
CONSULTANTS

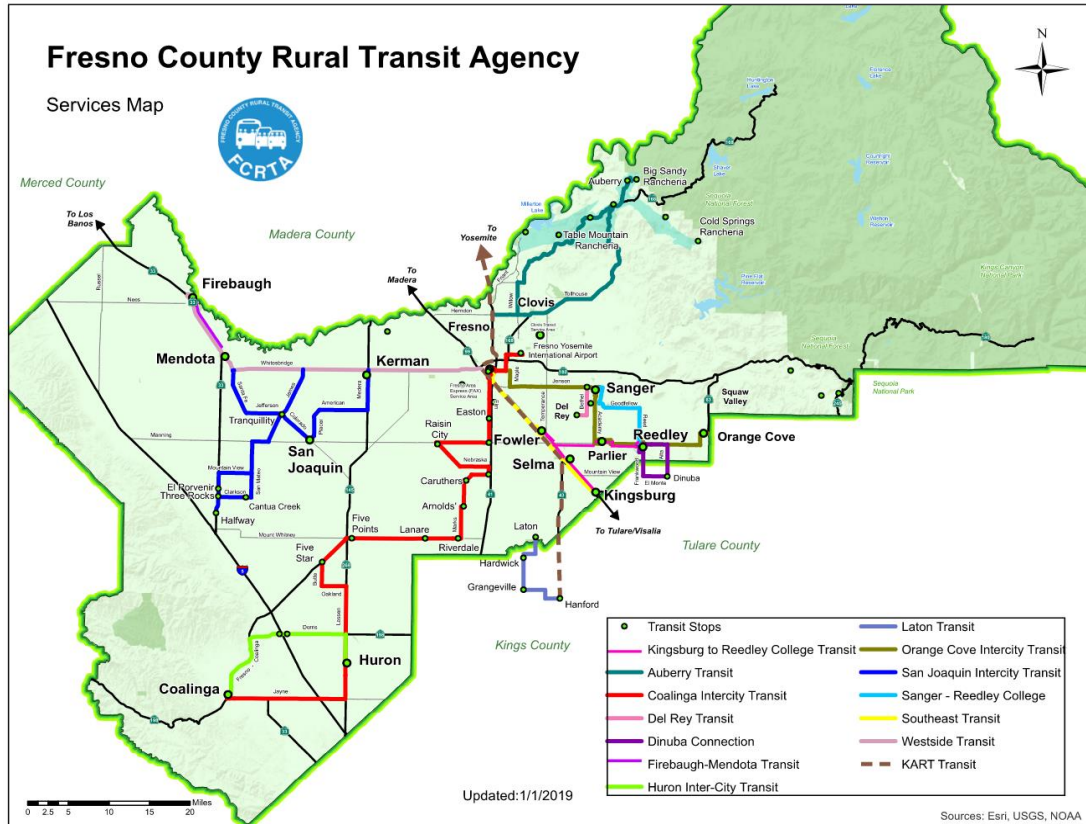


# Agenda

- Welcome and introductions
- Review plan and recommendations
- Next steps
- Questions and discussion

# Fresno County Rural Transit Agency

- Serves rural communities of Fresno County
- Intra-city demand response
- Inter-city fixed-route service
- Rural Transit dial-a-ride service
- 13 incorporated cities
- 39 unincorporated communities
- Disadvantaged areas



# Microgrid/Resiliency Hub Feasibility Study

## What are Microgrids?

Small, independent power systems that use sustainable energy to power everything from electric buses to cell phones





## Microgrids • Microgrids



Small, independent power systems that use sustainable energy to power everything from electric buses to mobile phones  
· Sistemas de energía pequeños e independientes que utilizan energía sostenible para alimentar todo, desde autobuses eléctricos hasta teléfonos móviles.

### Power for Buildings and Services • Energía para edificios y servicios

Electric Bus Charging •  
Carga de autobuses eléctricos



Electric Bike Charging •  
Carga de bicicletas eléctricas



Solar Power Generation •  
Generación de energía solar



Electric Microtransit Vehicle  
Charging • Carga de  
vehículos de microtránsito  
eléctrico



# Features of Resiliency Hubs • Características de los centros de resiliencia

English description ·  
Spanish description





### Expand Transit

Increase transportation service and access in rural, disadvantaged communities.



### Invest in Disadvantaged Communities

Leverage microgrid investments to redevelop vacant and underutilized land in rural, disadvantaged areas into multimodal community resiliency hubs, promoting economic development and improving quality of life.



### Reduce Transportation Emissions

FCRTA to a 100 percent zero-emissions fleet to improve air quality in disadvantaged communities and meet State of California requirements.



### Encourage Electric Vehicle Adoption

Build EV charging stations for residents, increasing the personal EV adoption rate.



### Leverage Investments

Leverage microgrid investments to redevelop vacant and underutilized land in rural, disadvantaged areas into multimodal community resiliency hubs, promoting economic development, improving quality of life, and supporting residents during emergencies.



### Cost Savings

Lower energy costs that can be reinvested into FCRTA services.



### Increase Resiliency

Create a more resilient Fresno County by providing backup power for FCRTA's operations and critical emergency services during power outages and emergencies such as wildfires.



### Support Other Transit Agencies

Provide a blueprint for other rural transit agencies to deploy microgrids to support fleet transition to low or zero emissions.

# Project Goals

# Project Process

- Conducted community outreach
- Successfully submitted FCRTA EV Fleet Transition Plan to CARB and Federal Transit Administration
- Conducted energy assessments for FCRTA's service area, including 13 cities and 39 unincorporated areas
- Determined 5 sites for future evaluation through criteria ranking
- Conducted energy, civil, cost, and feasibility assessments at 5 sites
- Developed additional criteria methodology and ranking to determine top 2 sites
  - Determined top 2 sites for further study for Phase I
- Cost/Benefit analysis of top 2 Phase I sites
- Multi-modal analysis and mobility recommendations
- Conducted financial and ownership structure evaluation
- Site design model
- Draft report of findings



# Community Engagement

- Input from almost 1,000 community members!
- Community survey
  - Paper surveys on buses
  - Online survey
- Community events
  - Parlier
  - Fowler
  - Reedley
  - Kerman
  - Firebaugh
  - Huron





Accessible EV Mobility & Infrastructure For All



Fresno County Rural Transit Agency

# Fresno County Microgrid & Multimodal Resiliency Hub Feasibility Study



May 2024

# Plan has been released!



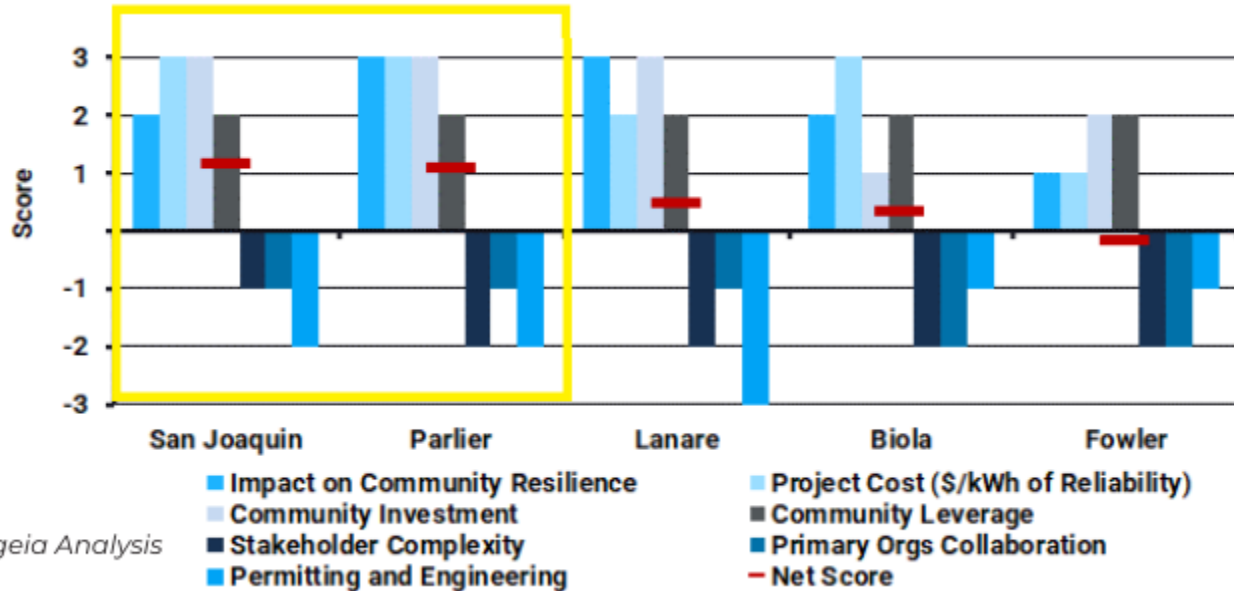
WALKER CONSULTANTS



# Site Criteria Framework

	Rating		
Benefit	1 = Low Benefit	2 = Medium Benefit	3 = High Benefit
<b>Impact on Community Resilience</b>	Low/No Positive Impact (0-1 Buildings Supported)	Medium Positive Impact (2-3 Buildings Supported)	High Positive Impact (3+ Buildings)
<b>Project Cost (Cost of Customer)</b>	>\$1000/kWh	\$500-1000/kWh	<\$500/kWh
<b>Investment in Community to Date</b>	High level of FCRTA support in the past (>1 FCRTA investment)	Moderate level of FCRTA support in the past (1 FCRTA investment)	Little or no FCRTA support in the past (0 FCRTA)
<b>Leverage from Community</b>	Minimal expected engagement, likely challenges garnering community resources	Moderate expected engagement, reasonable ability to leverage community resources	High expected engagement, high ability to leverage community
Risk	1 = Low Risk	2 = Medium Risk	3 = High Risk
<b>Stakeholder Complexity</b>	0-1 Stakeholders Involved / Strong Relationships	2-4 Stakeholders Involved / Moderate Relationships	4+ Stakeholders Involved / No/Weak
<b>Primary Organization Collaboration</b>	1-2 Orgs Involved / Strong Relationships	3-5 Orgs Involved / Moderate Relationships	6+ Orgs Involved / No/Weak
<b>Permitting and Engineering</b>	Straightforward permits, manageable engineering requirements	Extensive specialized permitting required, reasonable engineering requirements	Anticipated challenges obtaining permits, extensive engineering requirements

# Cost/Benefit Analysis



Source: Energeia Analysis

# Cost/Benefit Analysis

## Cost-Benefit Analysis Results

*Estimated net benefit of over \$200,000 for Parlier and over \$500,000 for San Joaquin over a 20-year period (breakdown in Figure 7).*

Figure E-9: Cost-Benefit Analysis Results for Phase I Sites

	Parlier	San Joaquin
<b>Benefits</b>		
Solar PV Savings	+ \$350,539	+ \$411,972
Battery Storage Savings	+ \$463,003	+ \$1,382,201
Federal Credits	+ \$127,028	+ \$155,990
State Credits	+ \$48,896	+ \$48,896
PG&E Credits	+ \$1,299	+ \$19,133
Health & Environmental Benefits	+ \$215,904	+ \$1,317,471
<b>Costs</b>		
Site Capex	- \$265,724	- \$1,021,453
Energy System Capex	-\$452,866	- \$822,796
Energy System Opex	-\$48,470	- \$65,403
<b>Total Project Cashflows</b>		
<b>20-Year Net Present Value</b>	<b>\$254,010</b>	<b>+ \$554,847</b>
<b>IRR</b>	<b>7.36%</b>	<b>+ 6.06%</b>

## Priority Site Cost-Benefit Analysis

### Benefits Modeled in Financial Analysis

- Site Electricity Bill Savings
- Transit Value of Reliability
- Community Value of Reliability
- Resource Adequacy Services
- Inflation Reduction Act Tax Credits
- CARB Low Carbon Fuel Standard Credits
- PG&E Power Saver Rewards Program
- CEC Demand-Side Grid Support Credits
- Community Charging Savings
- Community Health and Environmental Benefits

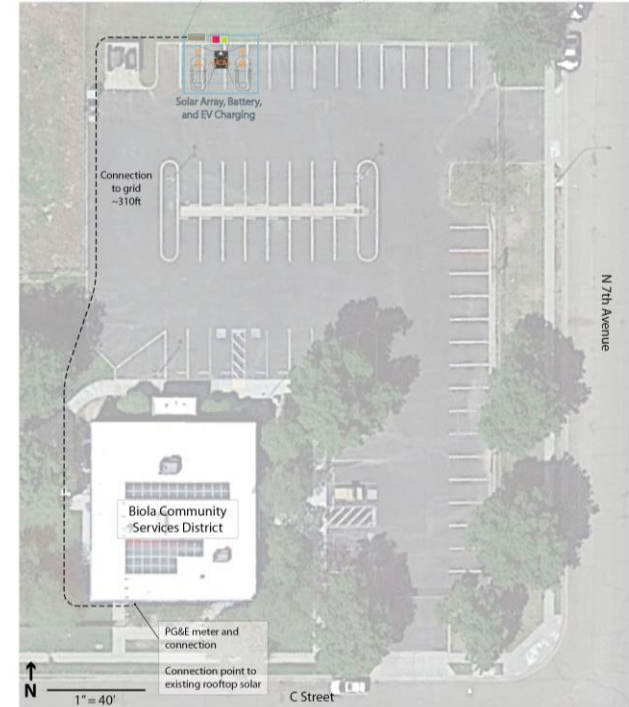
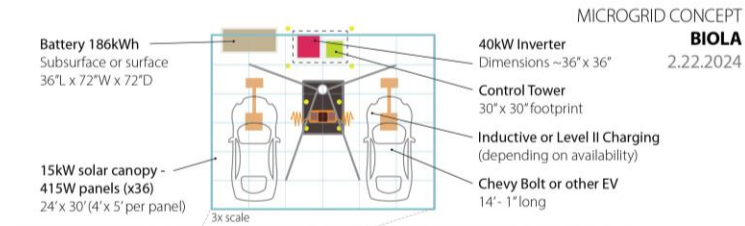
### Costs Modeled in Financial Analysis

- Parking Lot Infrastructure
- Interconnection and Panel Upgrades
- Conduit and Trenching
- Solar PV
- Battery Storage
- Level 2 Chargers



# Site Assessment: Biola

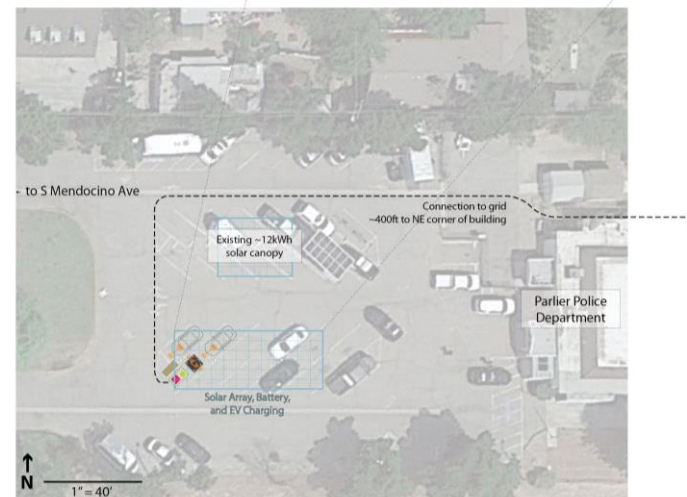
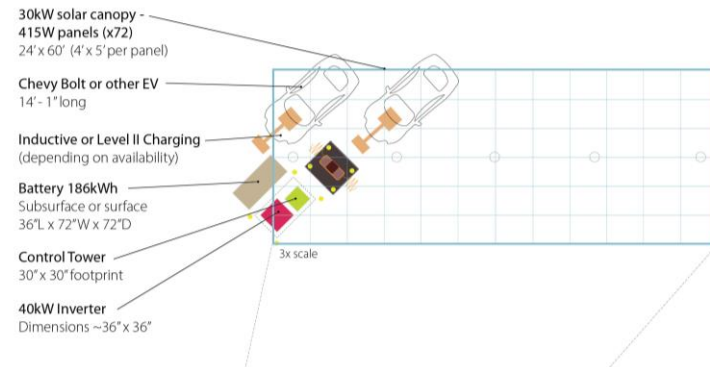
- Civil Assessment: No major civil issues
- Vehicles: Two battery electric sedans
- Vehicle Chargers: Two Level II and/or inductive charging depending on availability
- Microgrid/Resiliency Hub Type: Permanent hub, power supply to on-site critical infrastructure
  - Community Services District building
  - Hub amenities are managed by the Community Services District
- Microgrid Infrastructure: 15 kW of solar photovoltaic panels and 186 kWh of battery storage
- Power Reliability: 24 hours
- Site Infrastructure: Already paved with automated gates, lighting, striped parking stalls, and meter connection. EV chargers need installed. Electrical connections need to be installed for the charging stations and microgrid.
- Cost Estimate: \$500,000 - \$575,000\*
  - **Parking lot infrastructure:** \$0
  - **Connection to electrical service and site electrical needs:** \$175,000 to \$225,000
  - **Conduit and trenching:** \$30,000 to \$40,000
    - If wi-fi or cellular are not available for communications, conduit and trenching for communications infrastructure may be necessary.
  - **Microgrid**
    - Capital: \$300,000
    - Annual operating: \$2,000 (energy and maintenance costs)



\*All cost figures are planning level estimates based on assumptions

# Site Assessment: Parlier

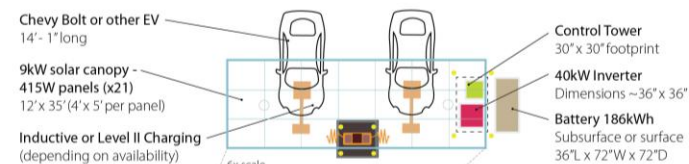
- Civil Assessment: No major civil issues
- Vehicles: Two battery electric sedans
- Vehicle Chargers: Two Level II and/or inductive charging depending on availability
- Microgrid/Resiliency Hub Type: Permanent hub, power supply to on-site critical infrastructure
  - Police Dept.
  - Hub amenities are managed by the City of Parlier
- Microgrid Infrastructure: 30 kW of solar photovoltaic panels and 186 kWh of battery storage
- Power Reliability: 24 hours
- Site Infrastructure: Improved with parking and lighting. Fencing, automated gates, and EV chargers need installed. Electrical connections will need to be installed for the charging stations and microgrid.
- Cost Estimate: \$600,000 - \$700,000\*
  - **Parking lot infrastructure:** \$100,000 - \$150,000
  - **Connection to electrical service and site electrical needs:** \$150,000 to \$200,000
  - **Conduit and trenching:** \$20,000 to \$25,000
    - If wi-fi or cellular are not available for communications, conduit and trenching for communications infrastructure may be necessary.
  - **Microgrid**
    - Capital: \$325,000
    - Annual operating: \$2,500 (energy and maintenance costs)



\*All cost figures are planning level estimates based on assumptions

# Site Assessment: Lanare

- Civil Assessment: No major civil issues
- Vehicles: Two battery electric sedans
- Vehicle Chargers: Two Level II and/or inductive charging depending on availability
- Microgrid/Resiliency Hub Type: Permanent hub, power supply to on-site critical infrastructure
  - Community Center
  - Hub amenities are managed by the Community Center
- Microgrid Infrastructure: 9 kW of solar photovoltaic panels and 186 kWh of battery storage
- Power Reliability: 24 hours
- Site Infrastructure: Improved with parking and lighting. Fencing, automated gates, and EV chargers need installed. Electrical connections will need to be installed for the charging stations and microgrid.
- Cost: \$525,000 - \$650,000\*
  - **Parking infrastructure:** \$75,000 to \$125,000
  - **Connection to electrical service and site electrical needs:** \$150,000 to \$200,000
  - **Conduit and trenching:** \$50,000 to \$65,000
  - If wi-fi or cellular are not available for communications, conduit and trenching for communications infrastructure may be necessary
  - Microgrid
    - Capital: \$250,000
    - Annual operating: \$2,000 (energy and maintenance costs)

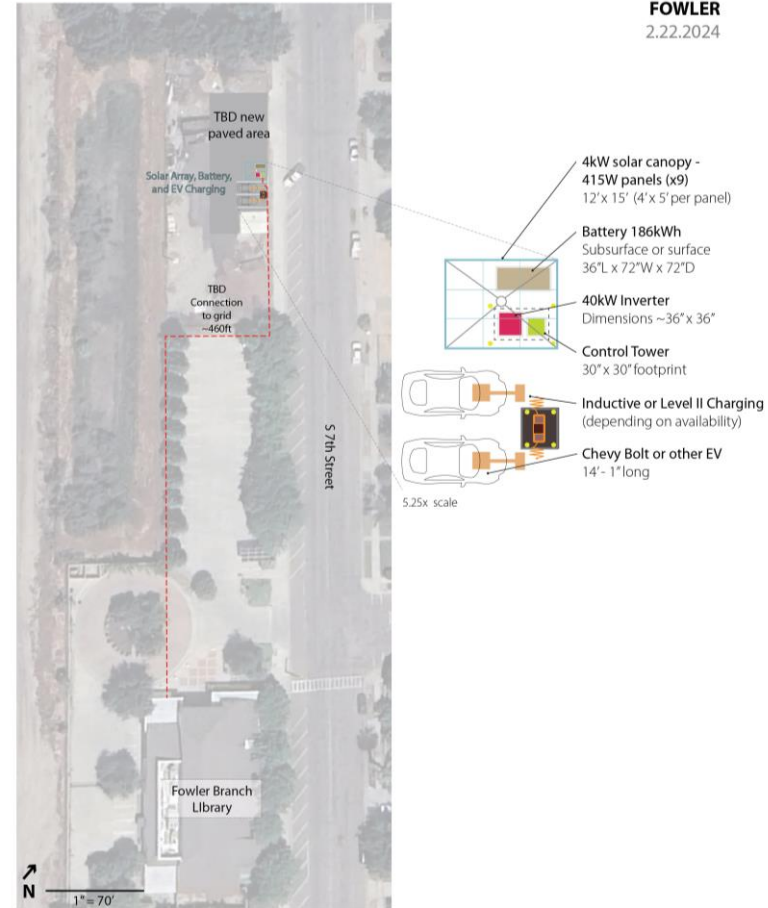


\*All cost figures are planning level estimates based on assumptions

# Site Assessment: Fowler

MICROGRID CONCEPT  
**FOWLER**  
2.22.2024

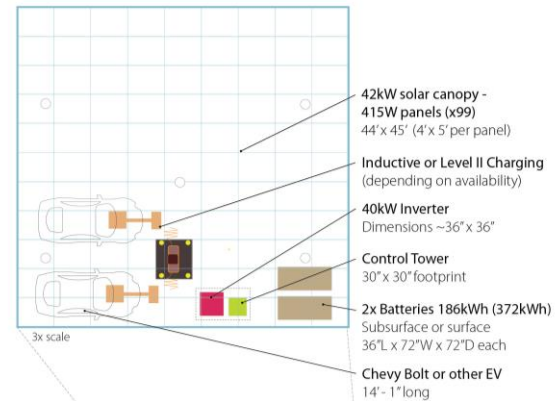
- Civil Assessment: No major civil issues
- Vehicles: Two battery electric sedans
- Vehicle Chargers: Two Level II and/or inductive charging depending on availability
- Microgrid/Resiliency Hub Type: Permanent hub, power supply to on-site critical infrastructure
  - Hub amenities are managed by the City of Fowler
- Microgrid Infrastructure: 4 kW of solar photovoltaic panels and 186 kWh of battery storage
- Power Reliability: 24 hours
- Site Infrastructure: The City storage yard is assumed to be converted to a parking lot. It needs to be graded and paved with parking space striping, fencing and automated gates, lighting, EV chargers, and electrical connection installed
- Cost: \$1M - \$1.25M\*
  - **Parking infrastructure:** \$500,000 to \$650,000
  - **Connection to electrical service and site electrical needs:** \$225,000 to \$275,000
  - **Conduit and trenching:** \$30,000 to \$40,000
  - If wi-fi or cellular are not available for communications, conduit and trenching for communications infrastructure may be necessary
  - Microgrid
    - Capital: \$250,000
    - Annual operating: \$2,000 (energy and maintenance costs)



\*All cost figures are planning level estimates based on assumptions

# Site Assessment: San Joaquin

- Civil Assessment: No major civil issues, no electrical box on site
- Vehicles: Two battery electric sedans
- Vehicle Chargers: Two Level II and/or inductive charging depending on availability
- Microgrid/Resiliency Hub Type: Permanent hub, power supply to on-site critical infrastructure TBD
  - Hub amenities are managed by the City of San Joaquin
- Microgrid Infrastructure: 42 kW of solar photovoltaic panels and 372 kWh of battery storage
- Power Reliability: 24 hours
- Site Infrastructure: Since the site is not improved, it will need grading and paving with parking space striping, fencing and automated gates, lighting, EV chargers, and electrical connection
- Cost: \$1.6M - \$1.9M\*
  - **Parking infrastructure:** \$800,000 to \$1M
  - **Connection to electrical service and site electrical needs:** \$150,000 to \$200,000
  - **Conduit and trenching:** \$20,000 to \$25,000
  - If wi-fi or cellular are not available for communications, conduit and trenching for communications infrastructure may be necessary
  - Microgrid
    - Capital: \$600,000
    - Annual operating: \$3,500 (energy and maintenance costs)



\*All cost figures are planning level estimates based on assumptions



# Development and Ownership Models

Model	Model 1: FCRTA/Community-Built and Owned Model	Model 2: Design-Bid-Build or Design-Build	Model 3: Power Purchase Agreement
Construction And Development	<ul style="list-style-type: none"> <li>Public resources, such as local, state, and federal grants, loans, bonds</li> <li>FCRTA would work with a community partner for funding</li> <li>FCRTA would oversee the construction management process, including the design, bid, and build</li> </ul>	<ul style="list-style-type: none"> <li>FCRTA would hire a designer to prepare plans, drawings, and documents and invite construction contractors to bid to for construction</li> <li>FCRTA would hire a general contractor to manage the project</li> <li>In a design-build process, FCRTA would hire one design-builder to provide both design and construction</li> </ul>	<ul style="list-style-type: none"> <li>A third-party, private sector developer designs, constructs, owns, operates, and maintains the microgrid and all equipment on behalf of FCRTA and the community partner</li> <li>FCRTA and community partner purchase power generated at the site for an agreed period and cost.</li> </ul>
Operations/Maintenance	Local government responsible for site operations and maintenance	Local government responsible for site operations and maintenance	Private sector developer
Conclusion	<p><b>Unlikely the best alternative for the FCRTA</b></p> <ul style="list-style-type: none"> <li>While FCRTA and the community retain control</li> <li>Risks related to costs, additional staffing, and mission drift</li> <li>Significant administration time and resources</li> <li>A small, rural agency does not have real estate and capital projects or architects, engineers, finance, and energy experts</li> </ul>	<p><b>May be realistic if grant funding is available</b></p> <ul style="list-style-type: none"> <li>FCRTA would need to hire a capital project manager to oversee contractors</li> <li>Project would be unique in that FCRTA would fund and oversee design and construction in coordination with a community partner, but the partner, not FCRTA, would own the land</li> </ul>	<p><b>Possible solution</b></p> <ul style="list-style-type: none"> <li>Low or no FCRTA upfront capital or ops costs</li> <li>Energy cost predictability and savings</li> <li>FCRTA could focus on its core transit mission while still supporting the fleet conversion</li> <li>Can average local tax credits in the form of lower energy rates, which it cannot currently do as a public agency</li> <li>FCRTA would not be responsible for design, construction, or operations, which would limit its control</li> <li>Outside advice would likely be needed</li> <li>Microgrid projects are smaller than the PPA projects that have been built</li> </ul>



# Origin/Destination Analysis

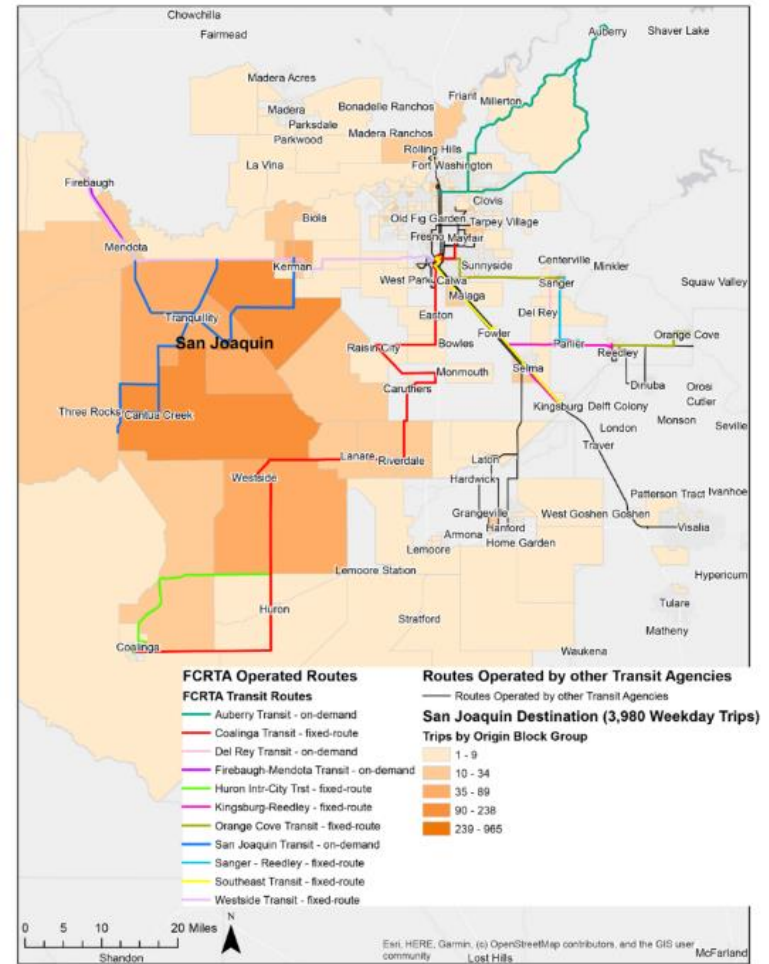
**San Joaquin:** Roughly two-thirds of trips occur in or around the San Joaquin, Three Rocks, Cantua Creek, and Kerman areas.

**Fowler:** Slightly less than half of trips to and from Fowler occur in the Fowler area.

**Parlier:** Roughly two-thirds of trips to and from Parlier occur in the Parlier and Reedley areas.

**Biola:** Roughly one-third of trips occur in the Biola and Kerman areas.

**Lanare:** Over one-third of trips to and from Lanare occur in the Riverdale and Lanare



# Mobility Review Findings: Survey

- People are making many trips within their community and the immediate surrounding areas, and fewer trips further away
- Residents have indicated there is a lack of convenient public transit
- Survey participants indicated that public transportation is one of the top five items of importance at resiliency hubs
- Low vehicle ownership, expensive to own vehicles



# Mobility Recommendations

## EV Microtransit

- Upon installation of the microgrids, microtransit service is recommended to be operated out of all five microgrid communities. Vehicles would be stored and operated out of each microgrid site. The service should allow riders to access both local destinations and destinations throughout Fresno County.

## EV Carshare

- EV carshare service at each hub can help to fill gaps in service coverage
- Membership-based car reservation subscription service, reserve a car on-demand through a website, cell phone app, or by calling a hotline

## Electric Bike Share/Bike Library System

- Many trips stay local within each microgrid community
- Biking provides a zero-emission transportation alternative that has a relatively low cost of administration compared to microtransit or EV charshare
- Bikeshare in rural communities can be operated in the form of a community library, where riders can take out a bike, just like they would a library book





















Wi-Fi  
FREE



CAR SHARE







# Next Steps

## Partnerships

Expand partnerships with the cities of Parlier and San Joaquin to create a task force to pursue project development and funding

## Ownership and funding model

Determine the appropriate model for funding and ownership structure

## Identify a funding pathway

Regardless of the funding structure, there will likely be necessary public or grant funding to support implementation

## Due diligence

If pursuing a Power Purchasing Agreement, retain appropriate advisors to perform due diligence on developers and investors, as well as opportunities for small, rural microgrids

## Coordination with the Electric Vehicle Charging Master Plan and Energy Management System Plan

## Phase II

The Phase II sites may have funding and implementation opportunities (Lanare, Biola, and Fowler). FCRTA is active in all three locations, and can leverage these partnerships as funding opportunities arise.

## Potential Funding Sources

*-FTA Grants for Bus and Bus Facilities (5339(b))*

*-State of California Transit and Intercity Rail Capital Program (TIRCP)*

*-Fresno County Measure C*

*-Fresno County Measure C New Technology*

*-Clean Vehicle Fueling Infrastructure Program*

*-Clean Mobility Options (CMO) Mobility Project Vouchers*

*-Innovative Charging Solutions for Medium- and Heavy-Duty*



WALKER  
CONSULTANTS



# TECHNICAL AND PLANNING SUPPORT

Fulfill the Federal Transit Administration's six key elements of your Zero-Emissions Fleet Transition Plan, which is a requirement for several major grant programs.

For more information email or visit:  
[zeroemissions@walkerconsultants.com](mailto:zeroemissions@walkerconsultants.com)  
[Walkerconsultants.com/zeroemissions](https://walkerconsultants.com/zeroemissions)

## SIX KEY ELEMENTS



Long-term fleet management plan



Demonstrate resources for the transition and operations



Consider State and local policy requirements



Assess how your facilities will support an electric fleet



Partnerships with utilities and alternative fuel providers



Workforce training and retention

Support is available through  
December 31, 2024