

TRAVIS AIR FORCE BASE: REGIONAL MACRO ENERGY RESILIENCE PROJECT



MARCH 2026

EXECUTIVE SUMMARY



CONVERGE
STRATEGIES



**Salas
O'Brien**

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ABOUT THIS EFFORT

This project was funded by the City of Fairfield, California through the Department of War (DoW) Office of Local Defense Community Cooperation (OLDCC) Installation Readiness (IR) program. OLDCC's IR program is a needs-based program codified under 10 USC § 2391. The program enables states and communities to partner with their local installations and the Military Departments to respond, as one community, to either the encroachment of a civilian community or threats to installation resilience that are likely to impair the continued operational utility of the military installation.

ABOUT CONVERGE STRATEGIES, LLC

Converge Strategies, LLC (CSL) provides consulting services focused on the intersection of energy, resilience, and national security. CSL provides project facilitation services, policy design and research, and market strategy development. CSL works frequently with the DoW, the U.S. Department of Energy (DOE), the national laboratories, city and state governments, and a variety of private sector organizations.

ABOUT SALAS O'BRIEN

Salas O'Brien is an engineering and technical services firm focused on advancing the human experience through the built environment. The team is engineered for impact™, helping clients achieve critical goals, advancing team members through growth and opportunity, and operating at the center of important global issues. Salas O'Brien is a top firm as ranked by Engineering News-Record and Consulting-Specifying Engineer, and has appeared for the past ten years on the Inc. 5000 list of North America's fastest-growing private companies. Salas O'Brien has executed more than 100 asset management projects for the Army, Air Force, and Navy including community partnership programs, Intergovernmental Support Agreements (IGSAs), climate assessments, and energy management.

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ACRONYM LIST

AFB	Air Force Base
ATC	Authority to Construct
BAAQMD	Bay Area Air Quality Management District
BESS	Battery Energy Storage System
BTM	Behind-the-Meter
CAISO	California Independent System Operator
CARB	California Air Resource Board
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CERRI	Community Energy Reliability and Resilience Investment
CCA	Community Choice Aggregator
COD	Commercial Operation Date
CMET	Community Microgrid Enablement Tariff
CMG	Community Microgrid
CPCN	Certificates of Public Convenience and Necessity
CPUC	California Public Utilities Commission
CUP	Conditional Use Permit
CTG	Combustion Turbine Generator
DBDB	Double Breaker Double Bus
DCIP	Defense Community Infrastructure Program
DER	Distributed Energy Resource
DoW	Department of War
DoWI	DoW Instruction
DSCR	Debt Service Coverage Ratio
DSO	Distribution System Operator
EIFD	Enhanced Infrastructure Financing District
EIR	Environmental Impact Report
EO	Executive Order
EPIC	Electric Program Investment Charge
ERCIP	Energy Resilience and Conservation Investment Program
ESCO	Energy Service Company
ESP	Electric Service Provider
FSSD	Fairfield-Suisun Sewer District
FTM	Front-of-the-Meter
GIA	Generator Interconnection Agreement
GIR	Generator Interconnection Request
GO	General Order
GO Bond	General Obligation Bond
GRIP	Grid Resilience and Innovation Partnerships Program
HDD	Horizontal Directional Drilling
I-Bank	California Infrastructure and Economic Development Bank
IR	Installation Readiness
ISO	Independent Service Operator
ISRF	Infrastructure State Revolving Fund
kV	Kilovolt

KW	Kilowatt
KWH	Kilowatt-hour
LSE	Load Serving Entity
MaaS	Microgrid-as-a-Service
MCE	Marin Clean Energy
MILCON	Major Military Construction
MIP	Microgrid Incentive Program
MW	Megawatts
NDAA	National Defense Authorization Act
NEPA	National Environmental Policy Act
OEA	Office of Energy Assurance
OLDCC	Office of Local Defense Community Cooperation
OSW	Office of the Secretary of War
PAB	Private Activity Bond
PG&E	Pacific Gas and Electric
PPA	Power Purchase Agreement
PSIG	Per Square Inch Gauge
PSPS	Public Safety Power Shutoff
PTC	Permit to Construct
PTO	Permit to Operate
PV	Photovoltaic
RCAM	Redwood Coast Airport Microgrid
SCADA	Supervisory Control and Data Acquisition
SMR	Small Modular Reactor
SWPPP	Stormwater Pollution Prevention Plan
TCC	Travis Community Consortium
TPP	Transmission Planning Process
TPR	Transmission Project Review
TTX	Tabletop Exercise
TPR	Transmission Project Review
USAF	United States Air Force
WRM	Western Railway Museum

EXECUTIVE SUMMARY

INSTALLATION READINESS IMPERATIVE

Travis Air Force Base (AFB), like most Department of War (DoW) installations across the globe, relies on critical infrastructure outside of the fenceline to execute missions. Installations utilize the commercial electric grid, publicly owned water and wastewater systems, and interconnected natural gas pipelines, all of which are vulnerable to malicious actors and extreme weather impacts. In the United States, utility infrastructure systems have suffered damage or disruptions from natural hazards such as higher temperatures, rising sea levels, hurricanes, and tornadoes. Utility infrastructure can also be compromised by degradation, and when these systems fail due to aging, unavailability of critical components can extend repair timelines.

To address its reliance on infrastructure outside of the fenceline, the DoW established a baseline requirement for installations to sustain essential functions independently from the electric utility grid “for a minimum of 14 days unless otherwise prescribed by the military department or other departmental guidance”. Through programs like the Office of Local Defense Community Cooperation (OLDCC) Installation Readiness (IR) grants, the DoW is exploring solutions that strengthen the resilience of installations and their surrounding communities to support mission readiness.

INSTALLATION READINESS PROJECT OVERVIEW

PHASE 1 OBJECTIVES AND APPROACH

From 2023 to 2024, CSL and Salas O’Brien (“the Team”) worked with the City of Fairfield, Travis AFB, Solano County, and the Travis Community Consortium (TCC) to conduct an OLDCC IR project for the region surrounding Travis AFB. The primary objective of this effort was to find solutions that strengthen the long-term operational resilience of Travis AFB while supporting the surrounding community. The Team continuously engaged with stakeholders through interviews, a Tabletop Exercise (TTX), and a Project Development Workshop. This collaborative approach identified the region’s infrastructure risks, hazards, and vulnerabilities, and prioritized the projects that could address them. Stakeholders identified and refined five project concepts across different infrastructure sectors, and the Team conducted further analysis to develop these project concepts into actionable implementation plans.

PHASE 2 OBJECTIVES AND APPROACH

In October 2024, the City of Fairfield was awarded follow-on funding from OLDCC to conduct a Phase 2 IR project. The stakeholders from Phase 1 chose to focus this effort on electricity infrastructure vulnerabilities and opportunities, such as additional transmission, distributed generation, microgrids, and storage technologies. The Team conducted additional stakeholder needs assessments and found strong priority alignment around maintaining operability of Travis AFB by providing 14 days of backup power for the base. Stakeholders identified additional community loads and economic development priorities that could be supported by the proposed infrastructure as co-benefits. With these goals in mind, the Team explored various technical solutions including a large regional microgrid, a small campus

microgrid for city facilities, and an installation microgrid. The Team presented these potential solutions at a TTX and facilitated discussions about the feasibility of each. Stakeholders chose to pursue a large regional microgrid, as it aligned most closely with the goals of this project. The Team worked with the City of Fairfield to identify a parcel large enough to support the selected solution, then developed a conceptual design for the regional microgrid and outlined an implementation plan that includes essential design considerations, potential funding sources, and regulatory requirements and timelines.

TRAVIS REGIONAL MACROGRID PROJECT OVERVIEW

PROJECT DESCRIPTION

The Travis Regional Macrogrid Project is designed as a 257 MW regional microgrid that integrates solar photovoltaics (PV) natural gas generation, and a 25 MW/50 MWh Battery Energy Storage System (BESS). This design supports 14-days of power resilience at Travis AFB, ensuring continuous operations during extended grid outages. Beyond Travis AFB, the microgrid will support a future industrial development currently being scoped and future community and regional growth. The size of the microgrid was determined based on the available land and the maximum feasible generation capacity, with a minimum of 25 MW allocated to Travis AFB, 25 MW for future city and county growth, and 150 MW for the industrial development. The proposed industrial development will include a new PG&E-owned 230 kV switching station, which is expected to serve as the primary connection point between the microgrid and PG&E's system. The conceptual design assumes that the industrial development project and its associated switching station are constructed as planned.

- **Generation.** The microgrid combines three complementary energy sources: solar PV (77 MW), BESS (25 MW/50 MWh), and natural gas turbines (184 MW) for a total peak capacity of 286 MW, or 257 MW under normal operations. During the day, solar panels can power operations and charge the BESS in addition to exporting power onto the grid. The batteries provide immediate backup power during outages and can provide grid export/peak shaving on days when solar is less available or during high usage periods. While islanded, the system will operate natural gas turbines to provide base load, with the BESS providing stability in parallel. This layered approach optimizes resource use, ensures that the microgrid can sustain operations for two weeks without relying on the main power grid, and maximizes efficient usage of natural gas with supplemental solar.
- **Substation.** A new substation is needed to support the new front-of-the-meter (FTM) generation assets and to interconnect the various voltage levels. The proposed substation will receive power from PG&E's system through an interconnection at the conceptual 230 kV switching station that will be built by future industrial developers and owned by PG&E. The substation will accommodate connection points for Travis AFB, future industrial development (via the 230 kV switching station), and future community loads.
- **Travis AFB Connection.** To support mission assurance, this project includes a new 60 kV underground transmission line from the new substation to Travis AFB. This ensures continuous electrical service if the existing overhead feeder experiences an outage. Installing the new line underground will further protect against potential disruptions caused by weather events, physical damage, or other external threats.

PROJECT OWNERSHIP AND OPERATIONS

The Team explored ownership and operational considerations for the proposed multi-customer, FTM microgrid.

- **Ownership.** A third-party ownership model is the best option for this project. Under California's Over-the-Fence rule, any entity selling electricity across property lines to multiple customers must be a regulated load-serving entity (LSE). LSEs include regulated utilities as well as non-utility providers such as Electric Service Providers (ESPs) and Community Choice Aggregators (CCAs). The Team explored numerous potential project owners—including PG&E, Marin Clean Energy (MCE), the City of Fairfield, and the DoW—and determined that these organizations are not eligible project owners and/or their goals do not align with the proposed project.
- **Operations.** Operation of the Travis Regional Macrogrid Project will require at least two entities: PG&E and a third-party operator. PG&E will serve as the Distribution System Operator (DSO) and oversee the continuity of electricity up to the connection point of the substation equipment. A third-party operator will serve as the Community Microgrid Aggregator (CMG Aggregator) responsible for maintaining the generation and substation assets. The proposed operational structure is adapted from the Redwood Coast Airport Microgrid (RCAM), California's first and only operational FTM microgrid.

PROJECT COST AND FUNDING/FINANCING PATHWAYS

The total cost of this project, including generation assets, a new substation, and the connection to Travis AFB, is approximately \$612M, inclusive of equipment, labor, site preparation, and construction requirements. The estimate does not include costs associated with utility interconnection studies or local permitting or the cost of land. Due to the high cost, this project will require a mix of public and private funding.

The project is eligible for several federal and state funding programs, including the DoW's Energy Resilience and Conservation Investment Program (ERCIP) and the California Energy Commission's (CEC) Electric Program Investment Charge (EPIC). However, many available funding programs are highly competitive, can take years to secure, and provide relatively small amounts of funding compared to project costs, leaving a large funding gap.

To make up this delta, the project will need to secure private financing. This can be pursued through public means, including municipal bonds, California Infrastructure and Economic Development Bank (I-Bank) loans, EB-5 Immigrant Investor loans, and private means, such as traditional bank loans and equity investments.

OVERALL PROJECT TIMELINE AND REQUIREMENTS

The typical timeline for a new 230 kV substation and microgrid interconnection project in California is 5–10 years from initial planning to commercial operation. The exact duration is influenced by project complexity, regulatory coordination, stakeholder engagement, and construction challenges. The Travis Regional Macrogrid Project will require extensive permitting in alignment with the California Environmental Quality Act (CEQA) and the Bay

Area Air Quality Management District (BAAQMD). Based on this, the Team estimates a 7-10 year timeline would be realistic for this project to be fully operational.

PROJECT ALTERNATIVE

This project has several barriers, including cost, permitting timelines, and regulatory approvals for natural gas generation. To alleviate some of these challenges, the Team has identified building blocks for a scaled down alternative that may be more feasible while still serving Travis AFB and future City of Fairfield and community loads. The alternative project still assumes that the future industrial development and associated 230 kV PG&E switching station are constructed as planned, meaning the microgrid project owners would just be responsible for constructing a new bay within the switching station. The substation layout for this alternative is largely consistent with the original design, though components would be appropriately scaled down for the microgrid's reduced capacity. The substation will still connect to the PG&E grid via a 230 kV switching station, and will supply Travis AFB with a redundant feed.

NEXT STEPS

Whether pursuing the Travis Regional Macrogrid concept or a scaled down alternative, The City of Fairfield, Solano County, Travis AFB, TCC, and the broader community have a unique opportunity to coalesce around an energy resilience solution that will provide mission assurance, improve community resilience, and support regional economic development.

In order to advance the Travis Regional Macro Energy Resilience Project, stakeholders should consider the following actions:

- **Coordinate with key stakeholders.** Meet with decisionmakers to gauge project appetite. This includes:
 - Travis AFB engagement with the Air Force Office of Energy Assurance (OEA) regarding potential offtake agreements like a Power Purchase Agreement (PPA).
 - Fairfield and Solano County coordination with PG&E to maintain open communication channels.
 - Potential engagement with the California Energy Commission (CEC) to explore options given California's informal limit on natural gas generation plants above 50 MW, including investigation of whether a national security project could avoid emissions-related hurdles.
 - Continued coordination among stakeholders on loads served, project goals, and building blocks should an alternative be pursued.
- **Clarify the revenue model.** Work with Travis AFB to prioritize a revenue model (such as Microgrid-as-a-Service (MaaS) or a DoW PPA to reduce ambiguity for potential financiers.
- **Define the financing strategy.** Determine the City of Fairfield's appetite for debt, which will inform the capital stack and guide project partners in pursuing funding..
- **Pursue grant opportunities.** Prioritize grants outlined in this report, starting with smaller-scale programs. Grants like the CEC's EPIC program, are faster and easier to secure than DoW funding, enabling early-stage work and reducing project risk.
- **Engage potential financiers.** Consult banks to identify target Debt Service Coverage Ratios (DSCRs) and loan terms, meet with equity investors to assess investment appetite

and return expectations, and coordinate with public financing partners such as the I-Bank and regional centers.

- **Issue a RFP for design-build.** The City of Fairfield should prepare a design-build Request for Proposal (RFP) to select a developer to construct the project.

Stakeholders must be clear about the time, effort, and resources required to bring this project to fruition: regulatory and interconnection processes may take up to 10 years; a variety of creative funding and financing methods will be needed to cover the estimated \$612M cost; and PG&E must be a project partner. This report provides an implementation plan that will help stakeholders navigate the challenges associated with this project, while also providing an alternative, scaled down approach that may increase feasibility. The alternative offers a pathway to meeting key project goals while reducing the total project timeline and minimizing costs. Whichever path stakeholders choose, a microgrid will provide significant economic and readiness benefits to Travis AFB, the City of Fairfield, and Solano County.

STEERING COMMITTEE STATEMENT

The Travis Regional Macro Energy Resilience Steering Committee has reviewed the project deliverables and created the following statement acknowledging the importance of this effort for the community and Travis AFB:

Statement of Support

"The Travis Regional Macro Energy Resilience Steering Committee endorses the Travis Macro Energy Resilience Project as a top regional and national defense priority that advances mission assurance, strengthens defense-critical infrastructure, and fortifies America's energy security.

Resilient, integrated energy systems are essential to sustaining Travis Air Force Base operations, enabling power projection, and ensuring mission continuity during disruptions. This initiative directly supports warfighter readiness while protecting the surrounding communities that underpin the installation's success.

We urge public, private, and military partners to align land-use planning, grid modernization, and clean-energy investment to deliver scalable, defense-grade resilience. By acting together, we reinforce the interconnected systems that secure Travis AFB, our region, and the nation's operational strength."

Steering Committee Members: Solano County, City of Fairfield, TCC, and Travis AFB