

# Feasibility Study of Regional Air Mobility Services for High Priority Transportation in the San Joaquin Valley

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## Introduction

Regional Air Mobility (RAM), using advanced electric and hybrid-electric aircraft, provides a cost-effective solution to connect communities that have been underserved by current aviation norms while also providing needed relief to capacity-constrained aviation hubs and regional highways. As this new generation of aircraft is deployed into the market, communities will have the opportunity to receive the benefits of utilizing their local airport infrastructure to provide a conduit for new opportunities in their region.

This project studies the potential opportunities and challenges to effectively implement (electric/hybrid) regional air mobility in the San Joaquin Valley and how the service can provide new high-speed transportation for high priority passenger and cargo movement within Fresno County and connection to coastal urban centers.

## Study Methods

This research examines the demand for this kind of travel, generating an inventory of existing infrastructure, studying new technology available, studying infrastructure requirements from the landside and the airside, and evaluating the potential for integration with, and enhancement of, current and planned ground transportation services. The project consists of five phases which are: Technology Landscape, Operational landscape, Development pathway, Infrastructure and Market Landscape

## Findings

Comparing airtime vs ground time required to get from Fresno Chandler Executive Airport in Fresno to the following airports in California shows air transport takes between 1/3 to 1/6 the amount of time as driving.

The costs listed for the projected electric aircraft known as Eviation Alice are based on estimates about the size

of the battery pack, calculated battery recharge power requirements, and average cost of \$.21 per kWh for electricity from Pacific Gas and Electric Company E-19 rate. Overall cost per trip for the Eviation Alice is very conservatively estimated at 40% of the King Air turbine aircraft, even though the manufacturer is suggesting that the savings may be up to 90%. Actual cost of operation for electric aircraft the size of the Eviation Alice remain unknown until these aircraft are available in the market, so this report has developed estimates based on actual data from smaller aircraft such as the Pipistrel Alpha Electro and Velis Electro. One such cost is for insurance, and this cost will likely be higher than current aircraft such as King Air C-90 because the insurance underwriters do not have data on the safety for the new electric aircraft.

This situation occurred when the first production electric aircraft, the Pipistrel Alpha Electro, came to the U.S. in 2018. The owners of the aircraft had challenges getting insurance and were turned down by many carriers until finally working with the Experimental Air Association, where they were able to get coverage. However, that coverage was very expensive compared with a comparable piston engine aircraft and this situation is likely to plague all the new electric aircraft entering the market for some time until substantial operational history is achieved.

### Policy/Practice Recommendations

Because RAM services will use existing Part 135 operators and existing airport infrastructure initially, there will not need to be any new policies at the State or Federal level developed. Some local policy changes may be needed in terms of local zoning for businesses to support RAM operations, but those would be on a case-by-case basis.

A good next step for Fresno County to prepare and plan for RAM service deployment would be a site-by-site evaluation in detail of the existing electric infrastructure and capacity for electric service expansion at Fresno Chandler Executive Airport, Reedley Municipal Airport, Coalinga Airport/Harris Ranch Airport, and Mendota or Firebaugh Airport. This study should also include potential for renewable energy and battery storage, connections with existing transit, and population growth projections within 10 miles of each location over the next 10 years.

When ASCE looked at the costs for highway and air service expansion in 2019 to compare with the California investment in High-Speed Rail, RAM services were not evaluated, which may have been due to the stealth mode most of the electric aircraft companies were in at that time. However, following the release of the NASA white paper in April 2021 about the potential for RAM services to transform and democratize air travel regionally (NASA, 2021), many of the aircraft developers have come out of stealth mode and the public has become increasingly aware of this new technology and opportunity. To be prepared for this new technology to serve the residents and businesses of Fresno County and the San Joaquin Valley, more detailed studies by county need to be completed and opportunities to leverage State and Federal funding for infrastructure pursued.

### About the Author

**Julio Roa, Ph.D., PE, PMP** is currently an Assistant Professor at California State University, Fresno. The aim of Dr. Roa's research is to make air transportation sustainable. This includes researching renewable energy supplies to support the aviation industry's transition to renewable energy systems, as well evaluating required modifications and additions to airport infrastructure to accommodate for new technologies and logistics.

**Joseph Oldham** is the President and CEO of New Vision Aviation, Inc., a 501c3 non-profit charitable organization focused on providing aviation education for youth and residents of communities of color and low-income neighborhoods in the San Joaquin Valley.

### To Learn More

For more details about the study, download the full report at [transweb.sjsu.edu/research/2129](https://transweb.sjsu.edu/research/2129)



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