

The Impact of Accessible Advanced Air Mobility Services on Economy, Education, and Workforce Development

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This paper addresses a proposed air corridor planned to be established between the University of North Texas (UNT) and the Choctaw Nation of Oklahoma (CNO), and its impact on economy, education, and workforce development. Once established, this air corridor (Figure 1) is expected to serve as a model for accessible AAM services. The National Aeronautics and Space Administration (NASA) defines AAM as "safe, sustainable, affordable, and accessible aviation for transformational local and intra-regional missions" [1] and AAM missions as rural and urban operations that occur below ranges of 300 nautical miles, including passenger carrying and cargo delivery technologies [2].

Accessibility: The term "accessibility" refers to the ability of end users to conveniently access the services and includes the proximity of desired origin and destination to available takeoff and landing locations [1, 2]. Due to airspace regulations, congestion in urban settings, demands for use-cases beyond urban settings such as photography, inspection of buildings, rail tracks, and power lines, and operational needs for rural applications including agriculture and transportation, have evolved. Such services are expected to have a significant impact on the surrounding communities. AAM services have the potential to be more accessible than traditional (historic) aviation services [1]. Accessible transportation will impact the economic and social well-being of communities [9]. However, there are many communities in the US that cannot equally benefit from advanced transportation technologies because of their location, economic inequity, disabilities, or other factors [4]. This has led to an increased realization that AAM accessibility is important for the larger community [3].

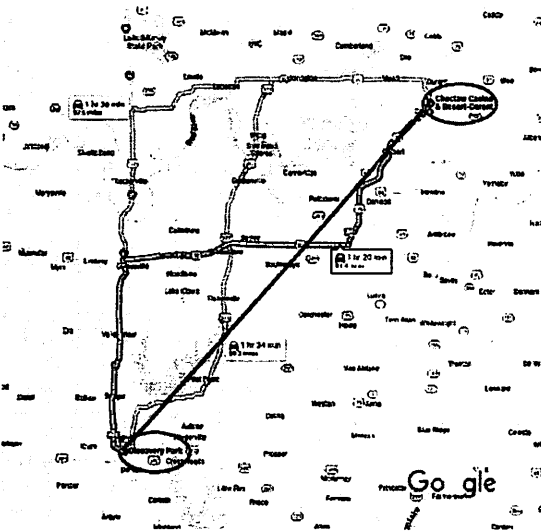


Figure 1. Proposed Air Corridor between UNT and CNO:
A Model for Accessible AAM Services

Accessible Vertiports: Much of the AAM network concepts will, by necessity, rely on vertiports or designated takeoff and landing areas [4]. Both urban and rural areas designated to receive vertiports will undoubtedly benefit from economic development opportunities, not only from the construction of the infrastructure, but also from the commerce that follows [4]. Traditionally, commercial aviation has dealt with public opposition due to issues such as airport congestion and aircraft pollution imposed on communities [5]. Vertiports have the ability to overcome these issues since AAM vehicles are electric and will not be competing in the same airspace as general aviation. Thus, vertiports will more likely be located in rural as well as densely populated urban areas, including inner cities and suburbs.

Societal Benefits: Constrained employable labor has created a burden on industry, particularly in the post-COVID era. AAM operations have the potential to provide significant benefit to both rural and urban markets by making use of available resources more efficiently (such as through improved productivity), increasing social benefits such as workplace safety, and decreasing the environmental impact of other operations [7]. However, this will only be possible where viable, functional vertiports are constructed and made operational.

Connecting Rural and Urban Communities: Rural communities, such as Native American reservations, represent areas that can particularly benefit from AAM services. It is widely accepted that mobility is a

critical aspect of economic growth and vitality, that many Native American tribal reservations are economically depressed, and that residents in these areas are often without reliable (or at time zero) means of personal mobility [8,9]. While home to millions of citizen residents, many indigenous Native American reservations have population densities of less than six residents per square mile. Moreover, due to culture, family demographics, societal backgrounds, and rural economic conditions, these same individuals are highly likely to stay within those geographic boundaries [8,9]. Transportation innovation and accessibility is essential to the growth and sustainability of rural communities, such as Native American reservations, as it provides access to industry, employment, health care, education, and other critical services [8].

Education and Workforce Development: AAM provides a unique opportunity to create programs from K-12 through university education. Schools, community colleges, and universities throughout the US are designing curricula for future workforce needs of the uncrewed aviation industry. AAM infrastructure such as air corridors, the associated communication equipment placed along the corridor on the ground, vertiports and flight test facilities, and the co-located test facilities provide unique learning experiences for students at the same time filling the need for future workforce.

Further Studies on Vertiports: Vertiport research will need to address a number of questions. First, social issues including noise, privacy, and pollution [5] need further attention. Second, there are trade-offs in AAM operations that need to be evaluated against social issues. Depending on how AAM aircraft are operated, results could include improved ground congestion conditions, as well as reduced carbon emissions. Third, there could be a shift in consumer preference to the benefit of less dense communities (e.g., rural areas, suburbs, etc.) resulting in modified travel behaviors, land use, and other optimized impacts [6]. Since the vertiports appear to have the ability to generate a positive impact on economy, education, and workforce development, additional research is needed to determine what industries are likely to locate near vertiports, what workforce training is needed to provide a sufficient and well-trained workforce; and how can the economic impacts be quantified and effectively communicated to key decision-makers? These behaviors and their implications require further investigation.

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