WEST VIRGINIA AVIATION

Innovative Opportunities for Economic Development

Prepared by:
Dr. Karen Kunz
Kunz Consulting
Morgantown WV
Kkunz2@gmail.com

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West Virginia Department of Transportation
Division of Multimodal Transportation Facilities

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EXECUTIVE SUMMARY

In West Virginia, the commercial and general aviation airports and aviation policy overall, appear to be in a perpetual state of *potential*. An earlier assessment of the state of the state's aviation policies and practices identified a comprehensive picture of aviation in in West Virginia today. A subsequent report builds on the findings here to explore innovative policy options that will support aviation and economic growth.

Seven commercial airports serve passenger and private air traffic, five of which are also federally compensated to provide essential air services to underserved communities in the state. The most active airports, in order of 2024 enplanement volume, are West Virginia International Yeager Airport (200,733) in Charleston, Huntington Tri-State Airport (101,042), and North Central West Virginia Airport (44,370) in Clarksburg. Total 2024 enplanements for the other four airports range from 4,300 to approximately 8,000.

Sixteen smaller, general aviation airports serve private, corporate, and charter air service, including cargo transport and aircraft storage and maintenance, and provide facilities to or property for development for industry manufacturing, service, and other related businesses. Many of the 23 airports have relationships with Marshall University's aviation education programs, and a number of them share facilities with military units, such as the National Guard and U.S. Air Force.

For most airports, annual income consists of operating revenues – aeronautical and non-aeronautical income -non-operating revenues such as grants and other miscellaneous income, and capital contributions which generally support construction and airport improvements. Grants and capital contributions are primarily FAA Aviation Improvement Program (AIP) funds, which cannot be used for operating expenses, meaning that airports must essentially be self-sustaining. Most often, that is accomplished through enplanements (commercial airports only), fuel sales, hangar rentals, parking, and property developments for industrial and aeronautic support businesses. And most often profitability is slim – and that is before accounting for equipment wear and tear.

Facilities and equipment maintenance, including terminal updating, parking lot and fence repairs, hangar painting, and striping – all of which usually have to be paid for by operating funds -have been put off, often for more than a decade or two (or more). Marginal net profits also impair airports' ability to muster matching funds required for federal grants; awards for runway, terminal, apron or other multi-million-dollar projects require 10% matching funds from the airport *and* state or local governments or airport

authorities. The Department of Transportation's annual stipend to the airports is not enough to cover match demands or even maintenance costs.

Predictions by the Bureau of Business & Economic Research for future state economic vitality, based on activity since 2017, emphasize the absolutely necessity for industrial diversification, and support substantial investment in state aviation:

> "Output growth in four of the healthiest sectors in West Virginia – energy, healthcare, information, and professional services – comes in at a cumulative 24 percent since 2017. Conversely, growth in the rest of West Virginia's economy is negative one percent since 2017. Overall, this implies that West Virginia desperately needs a healthier level of industrial diversification, or health in a wider swath of industrial sectors.[1]" (emphasis in original).

Investment in airports and aeronautic industry expansion has the capacity to drive economic growth within local communities and regions as well as throughout the state. A recent Government Accountability Office (GAO) report[2] notes that "air travel connects small communities across the nation and can drive economic growth through jobs and tourism in those communities."

This report identifies economic development projects with the potential to help airports meet their *potential*. Those include the obvious: development of enough hanger capacity to meet current and future demands, and renovation of existing and establishment of additional fuel farms, and particularly biofuels capacity. Additional needs include modernization and expansion efforts to accommodate everything from terminal upgrades and parking structures to infrastructure needed to add cargo and freight facilities and upgrade adjacent land to development-ready parcels to attract and retain industry, education and military tenants.

Also offered here are views of the future, specifically drones and advanced air mobility (AAM) aircraft. The state is uniquely positioned for drone manufacture, maintenance and professional use by government, commerce and industry for public safety and planning, military defense, recreation, logistics, and much more. AAM has many similar uses; however, their ability to carry passengers or cargo and maneuver easily within the state's challenging landscape give them even more potential, particularly when it comes to disaster and emergency response and recovery. Combined with the state's central location – within reach of almost half

[1] John Deskins, PhD. 2024. *West Virginia Economic Outlook 2024-2028*, Bureau of Business & Economic Research, John Chambers College of Business & Economics, West Virginia University.
[2] GAO. 2024 Commercial Aviation: Trends in Air Service to Small Communities. GAO-24-106681, Sep 25. https://www.gao.gov/products/gao-24-106681.

of the country's population-makes creation of a regional hub that connects all forms of transport is certainly possible.

For every airport the most immediate challenge is funding. State annual subsidies, while larger in 2024 than in prior years, are not large enough to enable airports to complete even one project, such as fence repair or hangar painting. This report identifies other options – funding sources, partnerships, and innovative combinations of the two -that can fill financing needs. After a quick review of traditional FAA resources, other federal sources, including the US Departments of Commerce, Economic Development Administration, Defense, Transportation, Energy and even NASA and NOAA are considered. The subsequent section on debt financing lists a variety of types of government bonds applicable to aviation development, as well as special district and tax increment financing options. Community Development Financial Institutions (CDFIs) and other lesser known and foundation possibilities round out listing of financing vehicles.

Collaboration is essential when it comes to putting these projects together. This report lists state agencies, community-level partnerships, regional planning and development councils (RPCs), and developers that would have beneficial interests in working together to realize regional and state-wide economic development.

Each of these sections concludes with ways in which they can be mixed and matched. True innovation would then combine the various combinations in distinct configurations to meet the unique needs of each airport. The report ends with suggestions for next steps: essentially, once the DOT determines the needs of the state and each airport, it could then prioritize possible projects to identify one or two to move forward. The matrices and examples offered here could then be used to help create a customized plan to bring the projects to fruition.

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INTRODUCTION

The 2024 assessment of aviation policy in West Virgina notes that the commercial and general aviation airports and aviation policy overall "appear to be in a perpetual state of *possibility*." The strengths, challenges and opportunities detailed in that report support that perspective, with individual airport and statewide possibilities categorized into opportunities that could be implemented immediately and those with broader economic impact that require more coordinated support. This report expands on both categories; however, the focus of the report is to identify and develop innovative ideas for larger-scale growth.

A Little Background

Within the state there are seven commercial airports, five of which are also provide essential air services, and sixteen smaller, general aviation airports that serve private, corporate, and charter air service, including cargo transport and aircraft storage and maintenance, and provide facilities to or property for development for industry manufacturing, service, and other related businesses. Many of them have relationships with Marshall University's aviation education programs, and several share facilities with military units.

For most airports, sources of income are limited to operating revenues, non-operating revenues such as grants, and capital contributions. Most often profitability is slim, and that is before accounting for equipment wear and tear. Facilities and equipment maintenance, including terminal updating, parking lot and fence repairs, hangar painting, and striping – all of which usually must be paid for by operating funds -have been put off, often for more than a decade or two (or more).

Marginal net profits also impair airports' ability to muster matching funds required for federal grants; awards for runway, terminal, apron or other multi-million-dollar projects require 10% matching funds from the airport *and* state or local governments or airport authorities. For the last decade or so, the Department of Transportation's annual stipend has been barely or not even enough to cover the costs of fence repairs or lawn maintenance.

That said, projects are underway to expand infrastructure (Charleston, Clarksburg) which will modernize facilities and improve capacity. Sky West's addition of new destinations at select airports (Charleston, Greenbrier & Morgantown), has increased passenger demand,

leading to higher operating revenues. Larger enplanement numbers may also make the airports eligible for increased FAA allocations and other funding sources.

Economic Environment

For almost a decade, predictions by the Bureau of Business & Economic Research for future state economic vitality have emphasized the absolutely necessity for industrial diversification.

> "Output growth in four of the healthiest sectors in West Virginia – energy, healthcare, information, and professional services – comes in at a cumulative 24 percent since 2017. Conversely, growth in the rest of West Virginia's economy is negative one percent since 2017. **Overall, this implies that West Virginia desperately needs a healthier level of industrial diversification, or health in a wider swath of industrial sectors**.[3]" (emphasis in original).

Going into 2025, the income tax rate reductions enacted over the last few years were already challenging the state's fiscal capacity to meet public service needs. Drops in federal transfers via grants, agency allocations (i.e., social needs, such as Medicaid, WIC, and SNAP, education, transportation, agriculture, etc.) and the federal government shutdown, presage more extensive impacts from the "Big Beautiful Bill" and potential subsequent shutdown(s) in 2026, making state fiscal capacity even less stable and sustainable.[4]

> "After several rounds of rate cuts, the state's personal income tax collections have flatlined, while corporate income tax collections have plummeted. Combined with weak job growth, West Virginia's lawmakers face difficult choices in the coming legislative session."[5]

These circumstances add emphasis to the "absolute necessity" for investment in aviation as a means of industry diversification and growth. Yet, conversely, they also point to the potential discontinuation of annual stipends for the airports in state budgets for FY 2027 and beyond, eliminating the meager support provided and further stifling expansion of an industry that has been shown to foster economic growth for localities and the state.

[3] John Deskins, PhD. 2024. *West Virginia Economic Outlook 2024-2028*, Bureau of Business & Economic Research, John Chambers College of Business & Economics, West Virginia University.
[4] Sean O'Leary & Kelly Allen. 2025. *State and Federal Tax Cuts Have Given Billions to Wealthiest West Virginians; Amid Looming Budget Gap, WV Must Change Course*. West Virginia Center for Budget & Policy, Dec. 17.
[5] IBID.

A Government Accountability Office (GAO) report[6] notes that because "air travel connects small communities across the nation [it] can drive economic growth through jobs and tourism in those communities." The report goes on to note that several factors have precipitated the decline in air travel in small communities:

- Fewer flights went to small communities, but the aircraft were larger [most WV airports cannot accommodate larger aircraft]
- Pilot and maintenance workforce shortages
- Increased airline operating costs (e.g., fuel and labor)
- Travelers choosing to drive to their destination or use larger airports

The report recommends making more pilots available for hiring and using electric aircraft to address these issues.

The WV legislature appears to be taking an interest in the aerospace aspect of aviation policy. The aerospace industry is one of the fastest growing sectors nation- and state-wide, generating nearly $2 billion in annual economic impact in the WV alone. Within the industry, the equipment sector is anticipated to be a leader in job creation within the state's manufacturing subsectors, building on expansions by companies like Northrop Grumman. Lawmakers are beginning to see the light; proposed 2026 legislative plans include new workforce development programs (e.g., "Skills at Work") aimed at preparing students for aviation and technical careers, addressing the need for skilled labor in the Maintenance, Repair, and Overhaul (MRO) sector.[7]

In the meantime, several airports have been or are moving forward with pilot and airport management training through alliances with Marhsall University. Electric charging stations are/will be offered in select locations, with more planned throughout the state in future. Ways to foster more airport and community growth include infrastructure upgrades to land owned by and surrounding airports for development of aviation industry manufacturing and maintenance, and the addition of hangars for small-planes and commercial jet flights, service and training. Development of drone and AAM support, increased commitments with military units, and expanded educational offerings (management, maintenance) will enable airports to realize more "possibilities."

[6] GAO. 2024 Commercial Aviation: Trends in Air Service to Small Communities. GAO-24-106681, Sep 25. https://www.gao.gov/products/gao-24-106681.

[7] Aaron, Bob. 2025. West Virginia lawmakers eye aviation industry as key to economic development in the state. Fox News, Dec. https://wchstv.com/news/local/west-virginia-lawmakers-eye-aviation-industry-as-key-to-economic-development-in-the-state.

The Purpose of the Report

This Report builds on the recommendations illustrated in the 2024 analysis of West Virginia aviation and aviation policy to identify the most viable opportunities for growth, both locally and state-wide. Taking into consideration the limited nature of the state's budget and fiscal condition, alternative funding ideas are also considered. Brief case studies developed for several of the commercial and general aviation airports help to illustrate the ideas offered.

We begin with a summary of the strengths, challenges and opportunities outlined in the 2024 Report. Those that are the most likely to move from "possibility" to economic expansion are identified; that list is then supplemented by other innovative ideas for development. That leads to a discussion of traditional funding options, challenges, and alternative mechanisms, and from there we explore opportunities for collaborative partnerships and pooled funding mechanisms. The Report concludes with a discussion of the most viable combinations and suggestions for next steps.

WHERE WE LEFT OFF

The 2024 West Virginia Aviation Study profiles each of the state's commercial airports and several of the general aviation airports, detailing the strengths, challenges and opportunities for each facility. The report concludes with a collective assessment of aviation within the state, identifying opportunities that require less investment and could potentially be initiated in the near term, and those that would be more complicated and require more expertise, funding and time to implement.

Strengths

Throughout the state, the predominant strength is *location*. The state itself is centrally located for states east of the Mississippi, making it an ideal site for distribution, maintenance, and manufacturing industries, as well as pilot, maintenance and airport management education and training and national defense, and even electric air transport charging stations and alternative aircraft support. Within the state, the mountainous terrain makes it perfect for distribution, defense and both commercial and military training activities. Commercial airports offer easy travel to neighboring states and connections to major national airports, making destinations throughout the country accessible. General aviation airports offer prime locations for international industry support (i.e., Airbus maintenance) and again, the topography offers unique support for defense and distribution but also for drone and advance air mobility (AAM) activity.

Most importantly, the airports throughout the state are seeing increasing interest for all these activities, and for the most part, they have the land available to meet the demands. The ability to turn potentiality into reality and economic growth is there; the challenge they all face is the lack of support.

Challenges

Similarly, the predominant challenge facing all of the airports within the state is the need for *support*. What little executive branch and legislative support that has been initiated has rarely made it through to fruition. For example, House Bill 2183, introduced in the 2024 legislative session, proposed a pilot program to provide financial assistance to local, primarily general aviation airports for airplane hangar construction.

The proposed legislation would authorize the State Department of Transportation's (DOT) Division of Multimodal Transportation to

> "provide loans to counties, municipalities, and regional airport authorities specifically for planning, acquiring, constructing, improving, maintaining, or operating the various types of aviation hangars. [The program provides] specific eligibility standards that [would] consider factors such as site readiness, aviation education advancement, economic impact, and market demand for hangar space. The division [would] have discretion to limit the number of participating airports based on available funding and [would be required to] cooperate with state economic development agencies to explore funding opportunities."

To date, the primary support from general revenue sources has been the $12,500 annual stipend provided to each airport by the DOT; in 2024 airports received a supplemental allocation, bringing their total annual funding to $30,000. Whether for terminal upgrades, fuel farms, additional hangars, industrial development, parking facilities, or matching funds, the needs are plentiful. State annual subsidies, while larger in 2024 than in prior years, are not large enough to enable airports to complete even one project, such as fence repair or hangar painting. Given the structural budget challenges noted in the Introduction, the sustainability of even the $12,500 stipend in FY 2027 is in doubt. And while every little bit helps, the state's support is not enough to support even annual maintenance requirements.

Emergency Air Service (EAS)

Other financial support comes in the form of subsidies and guarantees for new airline commitments. For example. When Southern Airways Express held the emergency air service (EAS) contract for Morgantown Airport, from November 1, 2020, through October 31, 2024, they received annual subsidies starting at $3,146,083 in the first year, with annual incremental increases. The subsequent contract with United for service to/from O'Hare International Airport in Chicago required city guarantees of almost $6 million in FY 2025, $6.4 million in FY 2026, and $6.9 million in 2027.

Yeager Airport in Charleston offers a more complex example. Airlines that fly in and out of there have received subsidies to expand route capacity; the legitimate reason given is that it is the largest airport. But is it the largest because of demand or because the subsidies enable it to offer more flights and destinations? Does the composition of Yeager Airport's board and the members' proximity to the executive office impact subsidy decision-making? Subsidies are allocated at the discretion of state and municipal government decision makers, with no discernable criteria for allocations. Would other airports be equally successful with similar support?

All in all, the EAS model is broken and failing. The primary reason for this is that the FAA's Part 121 demands scheduled service within the program; as such, the smallest types of aircraft certified for have a 40-seat capacity, and planes must fly on schedule even if empty. In addition, EAS grants are awarded directly to the carrier, not the airport, and those awards do not cover the complete cost of emergency air services, leaving the state or local government to pick up the tab for the difference. In short, the Part 121 minimum operating cost requirements are prohibitive for smaller communities, yet EAS is required for most airports throughout the state. This structure makes EAS barely viable, if at all.

Other Barriers

Other challenges are not directly tied to aviation, but more along the lines of infrastructure and economic development support issues. The poor condition of roads and lack of state-wide broadband support, a week state economy and anticipated budget shortfalls, accompanied by reduced tax revenues, the lack of investment in education and health care, and failure to develop emergency protocols and dedicated funds for climate and other catastrophic events all make the state less attractive for potential industry and commercial location. In addition, there are no succession plans for airport management or heavy equipment replacement.

Opportunities

The opportunities identified in the 2024 report were largely *collaborative* in nature, with the DOT taking the lead in many instances with airport managers, other state agency commissioners, and municipal and non-profit economic development organizations. The recommendations made the most of the potential (strengths) and needs of the airports and were categorized into short-term and long-term opportunities. Those considered short-term were more easily addressed within one to two years.

Short-term opportunities

For the most part, the short-term recommendations focused on state-initiated relationship-building to develop collaborative prospects. One of the simplest ideas is for DOT to work with airport managers to create (and pay for) economies of scale through consolidated service deliveries, such as runway striping, painting (hangars, terminals, etc.), advertising and marketing, event planning, equipment service, and more; this could enable airports to direct savings to unique needs. More expansively, DOT could partner with state agencies to find opportunities in tourism, commerce, education, and communications that would benefit from development and promotion of collaborative events and opportunities to engage the public and encourage air travel.

Other collaborative recommendations include:

- Develop internships with Marshall Aviation Management School.
- Coordinate with airport managers and local community development efforts to recruit on-site manufacturing, services, and other industry businesses.
- Collaborate with Marshall University and WVU to reorganize and expand training and educational programs.
- Coordinate with airport managers to negotiate additional routes and collaboration between airports to maximize enplanements statewide and public access to air transport. This includes establishment and application of uniform subsidy qualification standards.

Long-term opportunities

Projects requiring more time, capital, planning and relationship-building to be realized were classified as long-term. In some instances, the DOT will need to play a larger role, such as with possible privatization or other uses of the two closed airports, or to marshal legislative support for bills needed to further developmental requirements. All in all, however, realizing these prospects and the subsequent economic development will require broad coalitions.

The most immediate need for both commercial and especially general aviation airports is additional hangar space, followed directly by maintenance of existing hangars. The demand for private plan storage is robust; many airports have developed waiting lists in the hope of finding fiscal support for construction projects. The pilot program envisioned the 2024 legislative session's HB 2183[8] was a step in that direction, but a very limited one at that. Substantial funding will be needed to produce the substantial number of hangars needed to meet demands.

Another, more immediate revenue generator will be investment in renovation of existing and creation of new fuel farms, including alternative fuels. Again, demand drives this recommendation. Other, much longer-term projects include

- Infrastructure upgrades to property surrounding the airports to produce commercial-development ready parcels.
- Creation of distribution hubs to recruit drone and unmanned helicopter delivery.
- Development of drone, EV aircraft and changing stations, and AAM flight training and facilities, manufacturing and maintenance training.
- Formation of drone and AAM facilities to support national defense installations.

[8] HB 2183 was referred to the House Finance Committee on February 12, 2025, where it languished until the end of session. More information can be found at BillTrack50.

Summary

The possibility for expansion of the aviation economy throughout the state, and with it, robust economic local development, is seemingly endless.

It is important to note that all of the initiatives discussed here are revenue producing, not just for the airports, but for the communities and state through direct and indirect economic development. They all support additional jobs and tax revenue directly and foster ancillary businesses that provide peripheral support and additional economic impact. Successful, growing communities encourage local population retention and growth, spurring additional businesses, housing, school demands – and additional demand for air travel.

Once integrated, initial economic investment can support exponential growth for airports and communities. In these ways, support for airport growth can benefit the state's declining population and encourage retention of young people. In addition, this growth would supplement the state budget, allowing for additional investment in education and infrastructure, which would make the entire state more attractive for business location statewide. This would spur demand for air travel and industry, also adding to local growth.

The potential return on investment is broad in scope and exponential in depth. The lack of direct involvement by the legislature and executive branch underpins the importance of investigation into alternative funding mechanisms and ways to combine them to order to move these possibilities forward.

The next two sections do exactly that. A practical discussion of common and innovative opportunities is followed by a similar, practical discussion of funding options and ways in which they might be combined.

OPPORTUNITIES

Introduction

Ranging from self-evident projects such as additional hangars and fuel farms -with innovative possibilities there- to more complex and advanced ideas that may do more to move the needle when it comes to economic growth, this section explores a host of possibilities. The ideas are presented to encourage discussion, particularly when considered with the financing ideas presented in the succeeding section.

For the most part, these opportunities entail taking advantage of and implementing strengths already present. For example, the Eastern West Virginia Regional Airport, a general aviation airport near Martinsburg, has the longest, widest, and heaviest runway in the state. Unlike most other GA airports, they have a considerable amount of flat land, much of which is shovel-ready for roads and development. Combined, these attributes make the airport an ideal location for national and international air cargo, freight and courier services.

The Obvious

The two prominent sources of revenue for most airports are fuel sales and hangar rentals. Nationally, fuel sales tend to generate more income; however, the demand for hangars is unrelenting, with demand exponentially outpacing supply and the potential for increased revenue rising every year.[9] The North Central Airport in Clarksburg, exemplifies most airports in the state. They report that its fuel tanks and hangars are long overdue for maintenance, updating and in some instances, replacement. In addition, they have demand to support more new tanks and a waiting list for additional hangar space.[10]

Hangar shortages

The most-often requested need in the 2024 state aviation study was funding for additional hangars. The refrain was the same across the state: if we build them, they will come. Many general aviation airports have waiting lists but often don't have the wherewithal to maintain existing hangars, let alone fund additional ones.

[9] Aviation Hangars Attract Investors as Soaring Demand Outpaces Supply. 2025. KeyCrew Journal, Dec.
[10] West Virginia Aviation Study, 2024, p. 46-7.

Hangars are expensive. T-hangars and box hangars are the most commonly requested. T-hangars tend to be the smallest and are designed and expected, with areas for individual general aviation aircraft. They are space conscious and provide owners with privacy and maximum security. Box or conventional hangars are exactly as the name implies, square or rectangular and able to accommodate larger (i.e., jets) and multiple aircraft, often with room for light maintenance.

Larger options include community or corporate hangars, generally larger than box hangars and more communal in purpose, they are used by business or shared by community groups, such as flying clubs. They often include extra space for amenities such as offices, lounges, and restrooms. Finally, MRO, or maintenance, repair and overhaul hangars, are commercial facilities generally equipped for heavy maintenance, with high-capacity fire suppression and power capacities. Theses extra-large hangars can also be used for military and cargo needs.

Hangar Type	Typical Size (sq. ft.)	Turnkey Cost (Per Sq. Ft.)	Total Estimated Cost
T-Hangar (Single GA)	2,000 – 2,600	$85 – $130	$170k – $340k
Small Box Hangar	5,000 – 7,000	$88 – $150	$300k – $700k
Corporate/Community	15,000 – 25,000	$100 – $165	$1.5M – $4.1M+
MRO/Specialty	30,000 – 60,000+	$120 – $220	$5M – $13M+

Average construction costs for the various hangars are shown in the table above.[11] This estimate does not include extras like doors. In addition to construction costs, other considerations include the cost of land development, such as grading and infrastructure, which can cost as much as the hangar itself. Once constructed, there are ongoing operating costs, such as utilities and maintenance.

T-hangars and box hangars are currently the most requested by airports across the state. T-hangars can generally bring in $500-$1,500 per hangar per month, while monthly box hangar rental can average $1,500 - $5,000 per aircraft. On rental alone, it can take approximately 10 years for airports to recoup the construction cost, based on average rental rates; however, the current demand may allow for rents on the high end of estimates. Amenities within the hangars, such as offices and lounges, can generate additional revenue. And, of course, with more aircraft come more fuel sales.

For both commercial and general aviation airports, the most common option for funding is through the FAA.[12] The FAA provides funding for hangars via Airport Improvement Program (AIP) and the Airport Infrastructure Grant (AIG) program under the Infrastructure Investment and Jobs Act, but with specific restrictions: (1) the airport must be publicly owned (state, county, municipality, etc.); (2) the hangar must be used for aviation-related purposes only; (3) it must be revenue-producing; and, 4) for most commercial and GA airports, they must have already addressed all "airside" (runways, taxiways, etc.) needs. With prior FAA approval and under specific circumstances, hangars can be used for other purposes. The real catch here tends to be the matching fund requirement. For smaller airports the AIP may provide up to 90-95% of the project costs, but for most small airports, the remaining, required 5-10% is often an uphill climb.

[11] Aircraft Hangar Development Guide. 2025. AOPA Airport Support. https://www.aopa.org/-/media/files/aopa/home/supporting-general-aviation/get-involved/airport-support-network/airport-support-network-aircraft-hangar-development-guide/hangar-planning.pdf#:~:text=Next%2C%20you%20need%20to%20decide%20what%20type,supported%20roof%20but%20open%20sides%20(no%20walls); Types of Airport Hangars: Which One Is Right for You? 2025. Monmouth Jet Center, Feb. https://monmouthjetcenter.com/types-of-airport-hangars/#:~:text=Airport%20hangars%20are%20large%20structures,build%2Dout%20in%20existing%20buildings.

[12] Frequently Asked Questions & Answers on FAA Policy on Use of Hangars at Obligated Airports. 2025. Federal Aviation Administration, July. https://www.faa.gov/airports/airport_compliance/hangar_use#:~:text=about%20COVID%2D19-,Frequently%20Asked%20Questions%20&%20Answers%20On%20FAA%20Policy%20on%20Use%20of,airport%20for%20exclusively%20aeronautical%20purposes.

Meeting fuel demands

The other primary need noted by airports across the state is for maintenance, renovation, and replacement of existing fuel farms as well as more tanks to expand capacity. Here again, demand outpaces supply and is expected to coninue exponentially. Forbes notes that global demand for aviation fuel is expected to almost double by 2032, with the US mirroring that growth.

Several airports within the state are in some stage of physical growth, from the runway lengthening at Morgantown Airport and terminal and taxiway expansion at Huntington Tri-State Airport, to the full-scale airport expansion at North Central (Clarksburg) and Yeager International (Charleston) airports.

Infrastructure development plays a significant role in driving the demand for aviation fuel. As air travel demand grows, existing airports often undergo expansion to accommodate larger aircraft, increased passenger traffic, and more flight operations. This expansion includes the construction of new runways, terminals, taxiways, and other facilities. More infrastructure means more flights, which in turn translates to higher demand for aviation fuel.[13]

Another thing to for airports to consider when upgrading or adding fuel farms is the increasing shift toward sustainable [aivation] fuel [SAF], also referred to as bio jet fuel. Unlike traditional fuel, storage of SAF fuels does not create an environmenal hazard (such as a brownfield or superfund cleanup site), allowing for additonal uses of surrounding property.

[13] Aviation Fuel Market Size, Share & Industry Analysis, By Fuel Type (Jet Fuel {Aviation Turbine Fuel}, Aviation Gas, Bio Jet Fuel), By End-user (Commercial, Private, Military), and Regional Forecasts, 2024-2032. 2025. Fortune Business Insights, Dec 22. https://www.fortunebusinessinsights.com/industry-reports/aviation-fuel-market-100427.

> [SAF} is used to power aircraft and has properties similar to traditional jet fuel but with a lower carbon footprint, depending on the raw materials and technologies used to produce it… Manufacturing bio-jet fuel from waste resources can create new economic prospects for farmers, improve the environment, and even enhance aircraft performance. The entry of renewable fuels in the aviation fuel industry offers the most promising opportunity for the market. [14]

The rapidly growing demand for SAF is driven by industry commitments and government mandates. The U.S. has a "Grand Challenge"[15] to meet 100% of domestic aviation fuel demand with SAF by 2050. SAF production is reliant on feedstock availability, so meeting production and projection demands has been challenging. However, this is also creating new market opportunities for production and infrastructure. In West Virginia, that translates to new partnership opportunities for airports with local farms.

Establishing a traditional aviation fuel farm or renovating an existing one involves a substantial upfront cost -often $80,000 to $150,000 for certified above- or under-ground storage tanks and concrete pad, and monitoring technology and dispensing systems. They must meet strict federal (FAA, EPA, etc.), state and local regulatory and safety requirements that dictate everything from construction standards to operational protocols and must ensure that they have solid spill containment and leak detection systems, proper ventilation, and essential fire prevention systems. For SAF systems, fuel costs can be twice the cost or more than conventional fuel.[16]

Fuel Cells

> "It is important to note that, in the short term, hybridization with a fuel cell and battery-based hybrid unit represents a viable option for achieving more electric aircraft. In addition to the technological considerations, a collaborative approach to sizing the two hybridizing devices must be undertaken, ensuring that it also incorporates an effective energy management strategy to limit the aircraft's maximal take-off mass."[17]

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[14] IBID.

[15] Sustainable Aviation Fuel Grand Challenge. ND. US Department of Energy. https://www.energy.gov/eere/bioenergy/sustainable-aviation-fuel-grand-challenge#:~:text=The%20SAF%20Grand%20Challenge%20is,jobs%20and%20the%20nation's%20economy.

[16] Ryu, Sohyeon & Janzen, Joe. 2024. *The Transition to Sustainable Aviation Fuel: Understanding Demand Response to Jet Fuel Price Changes.* Farmdocdaily, University of Illinois, Dec. https://farmdocdaily.illinois.edu/2024/12/the-transition-to-sustainable-aviation-fuel-understanding-demand-response-to-jet-fuel-price-changes.html#:~:text=Other%20events%20are%20more%20closely,consumption%20changes%20is%20just%200.6%25.

[17] Aliberti, P., Simone, C., Addesso, P., G. De Piano, Donsì , F., Galdi, A., Maritato , L., Pantani, R., Pianese C., Polverino, P., Postiglione, F., & Sorrentino, M. 2025. Fuel cells in aviation: challenges to power the future of

Biofules may be a relatively immediate solution to to the quest for enviornmentally friendly, fuel-efficient fuels; however, until synthetic alternatives are devleoped to replace conventional fuel, SAFs will continue to be a combination of the two. Carriers such as Scandavian Airlines and manufacturers such as Airbus have/are modifying their aircraft to accommodate SAFs[18] but they are also leading the charge for fuel cells as an even more efficient fuel source.

Hydrogen fuel cells are basically a combination of hydrogen and oxygen from the air which, when combined, produce water and electrical energy. An electric motor uses this energy to drive propellers, creating a propulsion system for aviation use.

> "This propulsion system does not produce any emissions of CO_2 or NO_x or particulates—its only emission is water. In other words, the FFC reduces the climate impact of aviation by as much as 95 percent—i.e., to virtually zero. Since the propeller is the only remaining source of noise, the FFC also emits much less noise. A further advantage is that the platinum used in the fuel cell is highly recyclable. When processed properly, it can be reused almost indefinitely."[19]

One way to create fuel cells is to convert methane into liquid hydrocarbons or hydrogen and then combine that with oxygen using high-temperature catalysts or plasma-based technologies. For example, Independence Hydrogen recently opened a small hydrogen recycling plant in Petersburg, Virginia; it converts excess hydrogen from a nearby bleach plant into hydrogen which is then used by Walmart to power forklifts.[20] *West Virginia's vast store of natural gas gives it a considerable advantage in the development processes*, as a supplier or processor, which could, in turn enable even smaller airports within the state to function as refueling centers. This should also made recruiting efforts to aviation support industries more attractive.

Even with Independence Hyrodgen's success, fuel-cell powered aviation is a long way off. Estimates for clean energy, hydrogen-powered electric powertrains in regional aircraft range from 2035-2050.[21] However, with the considerable industry interest and research

flight. *Energy Conservation and Management*, *X. 29*: 1-22. https://www.sciencedirect.com/science/article/pii/S2590174525005586?ref=pdf_download&fr=RR-2&rr=9e020cd63e2390be.

[18] Jackwitz, S.E. 2024. Case Study: Greater fuel efficiency at SAS. Aircraft IT OPS Issue 61: Autumn 2024. https://www.aircraftit.com/articles/case-study-greater-fuel-efficiency-at-sas/.

[19] Henrich, I. 2024. A Brief Guide: How the How the Flying Fuel Cell™ works. Aero Report. MTU Aero Engines. **https://aeroreport.de/en/good-to-know/a-brief-guide-how-the-flying-fuel-cell-works.**

[20] Vazquez-Juarbe, J. 2025. 'On the rise:' Petersburg embraces clean energy with new hydrogen recycling plant. https://www.12onyourside.com/2025/10/08/rise-petersburg-embraces-clean-energy-with-new-hydrogen-recycling-plant/.

[21] Henrich, I.

currently in progress, that timeline could shorten quickly. Creating hydrogen capable airports and support facilites should absolutely be part of the WV DOT Multimodal Transportation's 5- and 10- year strategic plans. Airports across the state, especially GAs, will continue to rely on traditional fuel sales to fund operations for well into the future. Anticipating the ability to accommodate hydro-powered aircraft and industrial businesses will need to include continued support of traditional fuel farms.

Modernizing & expanding existing facilities

In the 2024 Aviation Study, all of the airports expressed interests in adding to or expanding physical accomodations within their facility. Many airports are in need of updating and upgrades, with some last efforts dating back to mid-century. Most are planning (or hoping) for larger facilities improvement projects, including parking and terminal upgrades, cargo and freight facilities, infrastructure improvements to create development-ready parcels that can accomodate industry and commercial businesses, and offices and training space that can accomodate expanded collaborations with universities and military organizations - all ways for airports to grow their airport and economic footprint.

Parking structures and car rental services, and terminal amenities such as expanded baggage claim, restrooms and waiting areras, food service, and offices and support for pilots and staff directly increase revenue but also attract additional air traffic and community consumers. For example, Morgantown Airport contains a Mediterrian restaurant patronized by local residents and offers business local advertising in passenger waiting areas. Other airports have cafes and food service, offices and amenities for pilots and staff, and These types of improvements are prime opportunities for collaborative partnerships discussed in the next section.

In this section we briefly discuss some of the larger development projects, including cargo and freight transportion, traditional distribution centers, infrastructure development of adjacent properties, creation of training centers, and more. Many of these projects can be completed through renovations and build-outs of existings

structures while others may be situated on shovel ready parcels where utilities and other infrastructure is already in place or easily added. Others require much more investment in time and money.

Cargo, freight, and distribution service centers

"Cargo, freight, and commercial distribution centers at airports are specialized logistics hubs for processing, storing, and moving goods via air." Because of the state's central location in the US mid-atlantic region – most cargo hubs are located in on both coasts and in the southern portions (Texas, Georgia) of the country - distribution centers are ideal ways for the state's general aviation airports to expand their facilities and add to community growth. And the number of cargo-focused hubs in the US is increasing: 2019-2020 alone growth at the 10 active cargo-focused hubs throughout the US grew almost 30 %. "The rapid growth of cargo-focused hubs stems from a variety of factors, including the growing ease and decreased cost of at-home package delivery, a dramatic shift in consumer behavior as a result of the pandemic, and a shift to airborne commerce due to the relatively low price of jet fuel in recent years."[22]

The primary requirement for establishment of a cargo-focused or cargo-only hub is land. Cargo, freight and distribution centers generally include large warehouses, automated sorting systems and facilities, and dedicated facilities for handling everything from perishables to oversized freight, and handling systems for loading/unloading aircraft and transferring cargo to trucks. In addition, they must meet TSA security and regulatory compliance requirements for screening facilities and threat assessment capability.

Major operations are driven by shipping services including FedEx, UPS, and DHL, and e-commerce industries such as Amazon. Airports with cargo and distribution centers drive demand for industrial warehouse and services that contrirbute to the global supply chain, often driving additional industrial development around the facility.[23]

Several of the commercial airports across the state have cargo handling facliities to some extent. Yeager International Airport has an existing arrangement with Federal Express; their CRW expansion project will add capacity, giving them room to grow. The FBO at Mid-

[22] Schwieterman, Joseph P. & Hague, Euan. The Rise of Cargo-Focused Hub Airports. 2021. Chadwick Policy Brief, Chaddick Institute for Metropolitan Development, Depaul University. https://las.depaul.edu/centers-and-institutes/chaddick-institute-for-metropolitan-development/research-and-publications/Documents/Rise%20of%20Cargo%20Airport%20Final%202.pdf.

[23] Cargo Airport, Handling and Transportation. 2023. Aviation Services, Mar. https://an.aero/cargo-airport-handling-and-transportation/#:~:text=The%20logistics%20and%20aviation%20industries,movement%20of%20goods%20across%20borders.

Ohio Valley Airport in Parkersburg, *MOV Aviation*, provides professional services for pilots and aircraft; they handle parking, fueling, baggage/cargo loading and unloading. Greenbrier airport offers limited cargo loading and unloading. North Central Airport in Clarksburg is moving in that direction as well, with promtional and industrial support from industrial consortium, The Mid-Atlantic Aerospace Complex (MAAC), and hangar client Mitsubishi Heavy Industries. Currently, these endeavors are little more than a toe in the pond: there is more than enough land to add needed facilities, and the potential for adding drones to airports' repertoire make exponential capacity expansion attainable.

Infrastructure & industry

All of the airports have land within the facilities as well as "outside the fence" that can developed for cargo, freight and distribution businesses, and buisness parks. Many airports are targeting businesses that support the aviation industry, including manufacturing, servicing, and training. Raleigh County Memorial Airport in Beckeley, for example, been

AREO certified to accommodate areospace industry businesses. In addition, they are working with the New River Gorge Regional Development
Authority to recruit international aviation companies and particularly those specializing in Airbus service and training because they have the runway bandwith needed for those heavier aircraft. With the proximity of the New River Gorge, partnering with the state Department of Tourism as well might enhance recruiting efforts.

Upshur County Regional Airport in Buckhannon, also has development-ready property available. In addition to industry related business, they are developing a diversified portfolio of tenants. "HealthNet Aeromedical Services supports the Airport's designation as a regional hub for daily medical flights. They maintain a 24/7 emergency response team at the facility to quickly transport patients to nearby medical facilities, reducing transportation time to a quarter of ground transport. Two other tenants are KCI Aviation, which services aircraft and small jets, and Dingess Lumber, which maintains a small hangar. Infrastructure-prepared development property is available for industry and aviation-related businesses."[24]

Essential infrastructure. Marketing, adequate roads, an educated workforce, and other state policies present some challeges in tenant recruitment. The real issue, however, is outfitting the properties with the infrastructure needed to attract devleopers. Basic utilities and stormwater management, site grading and preperation as well as road access, and zoning compliance and reclassification if necessary, are all essential to attract long-term tenents, especially if the goal is to build an industrial park similar to Clarksburg's *Mid-Atlantic Aerospace Complex*.

[24] West Virginia Aviation Study, 2024, p. 102.

Further, airports can leverage their infrastructure to partner with internet service providers to extend connectivity into the community, effecctively turning the airport into a digital hub.[25] This is especially relevant to rural portions of the state as local general aviation airports' physical location can serve as a backbone to bring broadband access to under- and unserved communities. Exploration of satellite- and space-based broadband[26], as opposed to reliance on traditional towers, may prove to be significantly more successful for the unique topography of rural West Virginia. Key trends in that area involve building large Low-Earth Orbit (LEO) networks for lower latency integrating with terrestrial networks, and offering services directly to smartphones. Major constellation operators and providers include, among others, Space X/Starlink, Amazon's Project Kuiper, and Viasat & Hughes Network System; direct-to-device emerging players include AST SpaceMobile and Viastat (both established operators already), Lynk Global, and Swarm (SpaceX). Another option involves deploying an aerostat, "a blimp-like [tethered] aircraft—from a base … that will be managed by [a local wireless company] 'to sustainably deploy and operate innovative wireless networks in underserved markets.'"

Expanding education and military use. Both commecial and general aviation airports have have established partnerships with educational institutions in the state (Marshall is most common) to provide flight, in some cases maintenance, and rarely, airport management training. The demand in all cases is growing exponentially, but airport capacity is not close to keeping pace. The need for facilities – hangars and warehouses for classrooms, storage and training – is critical to meet existing demand. It is also essential to support any legislative efforts to expand aerospace workforce training.

Similarly, committments to host military units and missions is limited by the lack of availabile infrastructure and facilities. Once again, hangars, warehouses and ofice space are essential to attract military interest in situating personnel and equipment at various airports. Efforts to encouarge drone and AAM (see below) defense operations with the state will require fully functional, committed facilities to support their establishment within the state.

[25] County brings broadband to Thun Field. 2025. Tacoma Weekly, Oct 20. https://tacomaweekly.com/county-brings-broadband-to-thun-field-p10846-103.htm.

[26] For example, see Top Satellite Internet Service Providers Market Share – Industry Analysis, Size, Trends & Growth Outlook (2025–2030). https://www.marketsandmarkets.com/blog/AD/top-satellite-internet-service-providers-NTN-market-share.

The Future is Here

Drones and more drones

The use of drones is not new; they have been used nation-wide for a number of years now for everything from aerial photography and surveying to package delivery to security and defense purposes. Even in West Virginia, the use of drones is relatively commonplace. For example, Eagles' Nest Drone Services is in Parkersburg provides aerial phtography and videography, surveying and mapping, thermal imaging, corp monitoring, and more. Most others focus on aerial photography, such as Appalachian Drones, in Morgantown, RedTail LiDAR Systems in Fairmont, and 304 Drones, in Summersville.

What is *new* is the idea that drones could be a means for economic growth for local airports- and in so, so many ways beyond just photography and surveying activites, making it essential to identify the most viable rountes and access. All of the uses listed in the table below offer opportunities business expansion across the state and illustrate areas of collaboration with state agencies, local governments, and non-profit organzations. Of course, in addition to *use*, opportunities also include manufacture, maintenance, and training (pilot and service).

The following chart offers a comprehensive listing of sectors and uses of drone technologies. It validates investment in the technology, supporting industry, and flight and service education as significant economic devleopment opportunities and should be a considerable part the state's aviation current and 5-year strategic plans. The titles in bold indicate sectors that are actively using this technology now and for which there is immediate and viable economic opportunity.

DRONE APPLICATIONS

SECTOR	PRIMARY USERS	CORE FUNCTIONS	REPRESENTATIVE USES
Medical Systems	Hospitals, Medical Systems, Medical Supply, EMS	Patient & Organ Transport • Emergency Transport • Rescue	Medical delivery, patient delivery, rescue service, emergency services
Commercial & Industrial	Utilities, Construction, Energy, Agriculture, Real Estate, Media	Inspection • Mapping • Monitoring • Imaging	Power line, bridge & rail inspection; construction progress tracking; precision agriculture; aerial marketing; film & sports coverage
Public Safety & Emergency Response	Fire, Police, SAR, Emergency Management	Detection • Assessment • Response	Search & rescue with thermal sensors; wildfire hotspot detection; accident reconstruction; disaster damage assessment; emergency supply delivery
Science & Environment	Conservation Groups, Universities, Research Agencies	Observation • Data Collection • Analysis	Wildlife tracking & habitat monitoring; flood and pollution mapping; volcano and ocean research; weather observation
Logistics & Delivery	Retailers, Medical Systems, Humanitarian Orgs	Transport • Rapid Access	Last-mile package delivery; transport of medical supplies, blood, vaccines to remote or disaster-affected areas
Government & Public Administration	Local, State, & Federal Agencies	Oversight • Planning • Inspection	Infrastructure audits; land-use monitoring; zoning enforcement; urban planning support
Military & Defense	Armed Forces, Border Security	Surveillance • Reconnaissance • Intelligence	Intelligence gathering; border monitoring; tactical situational awareness
Urban Planning & Smart Cities	Municipal Authorities, Smart City Operators	Sensing • Automation • Optimization	Traffic monitoring; infrastructure maintenance; environmental sensing; autonomous drone networks

SECTOR	PRIMARY USERS	CORE FUNCTIONS	REPRESENTATIVE USES
Insurance & Risk Assessment	Insurance & Reinsurance Firms	Evaluation • Documentation	Post-disaster inspections; claims verification; risk modeling
Mining & Extractives	Mining & Resource Firms	Measurement • Safety Monitoring	Site mapping; stockpile measurement; hazard monitoring
Telecommunications	Telecom Providers	Inspection • Network Planning	Cell tower inspection; network deployment and maintenance
Education & Research	Universities, Training Institutions	Research • Training	Engineering tests; field research; workforce training
Recreation & Hobbyist	Individual Users	Creative • Recreational	Photography; videography; racing
Future & Emerging Uses	Advanced Mobility & AI Firms	Autonomy • Human Transport	Air taxis; drone swarms; AI-coordinated systems

Civil and commercial drone operations fall under the regulatory pervew of the Federal Aviation Administation. FAA Part 107,[27] the small Unmaned Aircraft System (UAS) rule, is the default regulatory framework for private companies, nonprofits, universities (non-governmental research) and individual commercial pilots. The requirements to operate a drone are practical and include a remote pilot license or certificate, aircraft registration, a visual line of sight (VSOL) and use during daytime and twilight, and maximum altitude of 400 feet above ground level (AGL) – which with West Virginia's terrain can reach a singificat altitude. In addition, operators may not fly over people or moving vehicles and must have authorization required for controlled airspace (LAANC), which allows drone pilots to get near real-time approval to fly in controlled airspace, typically around airports.

FAA Part 107 is risk-based and incremental, which means that innovation proceeds via waivers and pilot programs rather than blanket permissions. Waivers can be obtained to exceed the 400 foot limit and operate beyond the visual line of sight, with night vision after dark, and over people and populations. Also, a waiver can be ogtained to operate multiple aircraft simultaneously. Public agencies the choice to operate under Rule 107 or have the choice of operating under Rule 107 or to apply for a waiver -particularly applicaable to emergency and first responder activiies. There is an entire system of

[27] Federal Aviation Administration. N.d. Small Unmanned Aircraft Systems (UAS) Regulation (Part 107). https://www.faa.gov/newsroom/small-unmanned-aircraft-systems-uas-regulations-part-107?utm_source=chatgpt.com.

Certificates of Waiver or Authorization (COAs) that authorize specific public operations in the National Airspace System.[28]

The FAA is in the process of issuing Part 108 and Part 146 which will extend the waiver requirement regarding the beyond the visual line of sight rules. The new rules, expected to be released in 2026 or 2027, will enable large-scale industrial deployment of autonomous drones. With ample lead time prior to finalization of Parts 108 and 146, the state has a unique opportunity to identify and satisfy infrastructure needs *before* release.

Government and military operations are not within the scope of FAA Part 107. Title 40 of the US Code (49 U.S.C. § 40102(a)(41)) regulates public aircraft operations (PAO). It covers use of government (federal, state, local) government owned and leased aircraft, including drones, distinguishing them from purely commercial aircraft. It allws public saftety agencies (fire, police, EMS) to use drones for missions like law enforcement, diaster response, and search and rescue, as well as infrastructure and construction monitoring of public assets.[29] The FAA provides detials on how to start and/or operate a drone program for public safety and government entities.[30]

Finally, the US Department of Defense manages operation of drones via Title 10 and Title 50 of the US Code. It operates outside FAA civil rules but requires coordination with the FAA when operating in shared airspace (such as the WV airports). They are typically used for reconnaissance, intelligence gathering, tactical operations, and border and maritime security. Unique attributes include the miltary's ability to operate armed drones, and the potential for overstepping privacy laws. The state's location has long been ideal for defense activities and the DOD has a long history of funding defense activities in the state.[31] With the escalting use of increasingly advanced drones for military operations in other countries, it stands to reason that West Virginia would continue to be an opportune location for positioning, manufacture, maintenance, and training.

[28] Federal Aviation Administration. N.d., Certificates of Waiver or Authorization (COA). https://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/systemops/aaim/organizations/uas/coa?utm_source=chatgpt.com.

[29] Federal Aviation Administration. N.d. Public Aircraft Operations. https://www.faa.gov/uas/public_safety_gov/drone_program/public_aircraft_operations#:~:text=Government%20agencies%2C%20law%20enforcement%2C%20and,receive%20compensation%20for%20flight%20operations.

[30] FAA guidance on how to start and/or operate a drone program: https://www.faa.gov/sites/faa.gov/files/uas/public_safety_gov/public_safety_toolkit/Law_Enforcement_Drone_Programs_Brochure.pdf

[31] West Virginia, Alaska, and Hawaii were the predominant recipients of federal earmarks for defense activities by far until the House ban on earmarks in 2011. Karen Kunz & Sean O'Leary. 2012. The Importance of Federal Earmarks to State Coffers: An Examination of Distribution Trends over the Decade. *The Journal of Public Budgeting, Accounting & Financial Management, 24(4)*.

Advanced Air Mobility

Advanced Air Mobility (AAM) encompasses innovative forms of air transport such as electric or hybrid-electric Vertical Takeoff and Landing (eVTOL), Conventional Takeoff and Landing (eCTOL), and Short Takeoff and Landing (eSTOL) aircraft, automated systems, cargo drones, and supportive infrastructure.
It includes:

- Urban Air Mobility (UAM): short-range on-demand passenger or cargo hops in or near cities.
- Regional Air Mobility (RAM): intercity or regional connections with smaller, efficient aircraft.
- Low-Altitude Mobility (LAM): cargo and services at low altitudes (e.g., drone deliveries).

Manufacturers currently engaged in development of these products include (among others): Beta, Elroy Air, Merlin & Ampaire (eCTOL), and Honda, Electra, Joby, & Archer (eVTOL).

The same characteristics that make West Virginia a great opportunity for drones hold true for AAMs. The state's mountainous landscape and rural communities, which make it

challenging for traditional ground transport, offer opportunities for AAM to provide communities and businesses with fast, reliable transportation. This would connect underserved portions of the state with emergency services, disaster responders, and even airports within the state. Further, because the state is located roughly 500 miles from almost half of the US population, it is in a prime position to become a regional hub for all forms for air transport.

State legislators have become somewhat familiar with AAMs. In 2022 they passed House Bill 4667,[32] which defines AAM aircraft and systems and limits regulation of them to federal and state authorities (removing local governments say in the matter). Unfortunately, the law, intended to create regulatory certainty, is ambiguous enough to potential, necessary inhibit infrastructure development, particularly regarding vertiports open to public use.[33]

There have been other efforts to move AAM forward. In 2023, the state received a $2.9 million NASA Congressional Direct Spending award for a mobile AAM education program, in collaboration with the Mingo County Redevelopment Authority. The program was initiated in Mingo County Central High School and will "be available and used at high schools like Mingo Central to train students for the rapidly growing industry."[34] Further, state's WV Resilient West Virginia plan includes creating an AAM innovation center in southern West Virginia and linking advanced manufacturing, cybersecurity, and aviation training to underserved workforce pipelines.[35]

Airports are slowly embracing AAM technologies as well. Yeager Airport is partnering with BETA Technologies to install AAM charging infrastructure for electric Vertical Takeoff and Landing (eVOL) aircraft and electric vehicles (EVs). Stations are planned for the Bill Noe Flight School at Marshall University. The estimated completion date is currently unknown.[36]

There is also commercial interest (more so than for drones) in developing AAM capacity in the state. *Elevating West Virginia, a* report funded by Vertx Partners,[37] highlights the potential for AAM jobs, economic impact, and sector growth. It encourages state leadership

[32] WV House Bill 4667. 2002. https://www.wvlegislature.gov/bill_status/bills_text.cfm?billdoc=HB4667+SUB+ENR.htm&i=4667&sesstype=RS&yr=2022&utm_source=chatgpt.com.
[33] See Article 2m. Promoting Public-Use Vertiports Act. §5b-2m-1. Policy. Https://Code.Wvlegislature.Gov/Email/5b-2m/?Utm_Source=Chatgpt.Com
[34] Bruce Justice. 2025. Officials unveil, launch joint Advanced Air Mobility project. Mingo Messenger, Oct 3. https://wvpress.org/breaking-news/officials-unveil-launch-joint-advanced-air-mobility-project/?utm_source=chatgpt.com.
[35] Resilient West Virginia. N.d. West Virginia Economic Development. https://westvirginia.gov/resilientwv/?utm_source=chatgpt.com/.
[36] Yeager Airport to install charging stations for eVTOL aircrafts. 2025. MetroNews, Dec 7. https://wvmetronews.com/2025/12/07/yeager-airport-to-install-charging-stations-for-evtol-aircrafts/#:~:text=––%20West%20Virginia%20International%20Yeager%20Airport,pick%20West%20Virginia%20to%20stop."
[37] Elevating West Virginia: a Vision for Advanced Air Mobility. 2024. Vertex Partners. https://vertxpartners.org/wp-content/uploads/2024/02/Elevating-West-Virginia-a-Vision-for-Advanced-Air-Mobility.pdf.

to act strategically on policy, funding, infrastructure, and ecosystem development. It notes that the national AAM market could reach $115 billion per year by 2035, creating hundreds of thousands of jobs, justifying an investment focus. In West Virginia alone, supporting the growth of AAM throughout the state could result in more than 5,400 jobs and millions in annual tax revenue. Although not West Virginia-specific, a Multistate AAM Collaborative, including the FAA and neighboring states -including West Virginia - has formed to align infrastructure and airspace planning.[38]

Rethinking EAS

The strong relationship between the West Virginia Department of Transportation and its regional neighbors – Pennsylvania, Kentucky, Ohio, and Virginia -offers West Virginia a unique and significant opportunity to be an integral part of a reenvisioned regional essential air service via AAM. The Multistate Collaborative was selected by US Department of Transportation and the FAA's eVTOL Integration Pilot Program (EIPP) to be one of eight projects spanning 26 states to accelerate the integration of AAM aircraft into the national airspace. The program allows eVTOL designs to operate at commercial airports before receipt of full certification, beginning by summer 2026 and targeting passenger transport and cargo logistics.[39]

By leveraging its assets and this partnership, the state and the WVDOT can be a regional and national leader in restructuring EAS. In so many ways, AAM has the potential to radically reduce cost, stretching the value of the EAS subsidies to support several regional airports instead of just one, and provide exceptional regional and emergency air transport.

Summary

Both the commercial and general aviation airports across the state have self-identified opportunities for economic growth- many of which are common to both types of facilities. Beyond the universal need for facilities maintenance and updating, their immediate "wish lists" include additional hangars, expansion of fuel farms, infrastructure upgrades, and additional facilities such as warehouses, hangars, offices and classrooms needed to increase cargo and freight capacity, education and training, and military alliances. Any *one* of these would be a game changer for the airports and for the state's economic growth.

[38] National Association of State Aviation Officials. 2025. Advanced Air Mobility Multistate Collaborative. https://nasao.org/page/advanced-air-mobility-multistate-collaborative?utm_source=chatgpt.com.

[39] Federal Aviation Administration, US. 2025. Electric Vertical Takeoff and Landing and Advanced Air Mobility Integration Pilot Program: Establishment and Request for Proposals. Regulations.gov. https://www.regulations.gov/document/FAA-2025-2633-0001.

In addition, the state is uniquely poised to advance innovative technologies such as drone and AAM air transport. There are a host of opportunities within each category that would allow the state to lead the way, thereby attracting industry leaders ready to move these innovations forward now. In addition, there are government, and particularly defense opportunities that already have available funding (see below) and so should be acted on immediately. Failure to act would be another missed opportunity (Kentucky's success in hemp industry development comes to mind) for West Virginia to be a leader in advanced air transportation.

FINANCING GROWTH

Introduction

The most immediate challenge for aviation growth is funding. Whether for terminal upgrades, fuel farms, additional hangars, industrial development, parking facilities, or matching funds, the needs are plentiful. State annual subsidies, while larger in 2024 than in prior years, averaged $12,500 per year - not large enough to enable airports to complete even one project, such as fence repair or hangar painting. The FAA offers several funding options; however, they require matching funds and use is limited to FAA regulations.

That's not to say there has not been successful funding for relatively recent projects.

> "In mid-2020, the Eastern West Virginia Regional Airport Authority finalized a nearly $4 million acquisition of additional property surrounding the airport. This expansion included five aircraft hangars, a fuel farm, and three aircraft. In addition, the airport enhanced its terminal building and installed a self-serve fueling station, allowing pilots to refuel their aircraft independently. [This allowed the airport to] welcome four new businesses and significant increases in aircraft takeoffs and landings, flight school training hours, fuel gallons sold, and charter trips booked."

Today, with one federal government shutdown under our belt and more likely to come, federal funding has never been more uncertain. Agencies have rescinded funding for awarded infrastructure projects, and other agencies have had to cope with reduced budgets and conflicting funding directives. "States and localities with greater reliance on federal dollars or a large federal presence will also experience the effects of federal closures to a greater degree.... [a] shutdown is "not an abstract fiscal standoff," it is a "stress-test" on state and local services with "cascading impacts: frozen grant flows, shrinking services, stressed staff, and worsening access for vulnerable communities."[40]

The uncertainty of state and federal fiscal stability adds to the rational for exploring alternative sources of funding. While the current economic and fiscal inadequacies may similarly impar the financing ideas presented here, creating collaborative relationships may enable creation of a funding collage of sorts to move projects forward. In some cases, projects may have to be completed in a similar, collage-type framework, using one project

[40] Parshall, Lisa. 2025. The Federal Shutdown: The Broader State and Local View. The Rockefeller Institute of Government, Oct 28. https://www.rockinst.org/blog/the-federal-shutdown-the-broader-state-and-local-view/.

to leverage the next. These ideas are explored after the list of alternative financing mechanisms has been articulated.

Federal Resources

The Federal Aviation Administration (FAA)

Traditional FAA financing generally denotes a small set of long-standing federal tools designed for *conventional airports and aircraft*, as opposed to emerging systems. They include:

Airport Improvement Program (AIP) Grants

AIP grants are the backbone of U.S. airport capital funding, typically providing 90%, or 95% for small, rural airports. The grantee must come up with the remaining 5%, and that often comes from state or local sources or a cobbled-together combination of the two. The federal funds are tied to FAA-approved Airport Capitol Improvement Plans (ACIPs).

AIPs follow the FAA's airport-centric definitions of infrastructure: runways, taxiways, aprons and pavement rehabilitation, safety areas, signage, and lighting, navigation aids and weather systems, noise mitigation. Funding qualifications prioritize commercial service, public use general aviation, and reliever airports. The Bipartisan Infrastructure Law, passed in 2021, added significantly more grant money to the AIP, and that made significant impacts on several of the commercial service airports in the state; however, some of the bill's funding has since been rescinded.

Passenger Facility Charges (PFCs)

PFCs (up to $4.50 per trip) are charged to airline passengers and can be used to fund capacity, safety, and noise reduction projects. *They can also be used to fund debt service for approved projects* (this will be especially important when discussing municipal financing). Because they are tied to enplanements, they are really only relevant to commercial airports and generally not helpful for general aviation facilities.

FAA Facilities & Equipment (F&E) Program

This financing method is only applicable to FAA-owned systems, such as air traffic control equipment, radar systems and communications.

Limitations of FAA Funding

FAA funding is particularly limited, especially for general aviation airports as noted, but also for most of the state's commercial service airports. Only two have enplanements over

100,000 and several have enplanements of less than 10,000, which limits AIP eligibility even more. This is particularly important when it comes to applying for funds to upgrade and modernize existing, add amenities, or otherwise improve and expand existing facilities.

Other limitations generally separate AAMs from traditional opportunities. The FAA definitions of airport and "non-airport" preclude forward-thinking air transport initiatives. Vertiports, vertistops, rooftop facilities, electric charging pads, hospital-based pads, and AAM in general are all ineligible for AIP funding. Further, the FAA also has no defined category for AAM infrastructure so efforts to shoehorn funding those needs into legacy categories often fails. Grid upgrades for high-capacity charging, on-site energy storage, and advanced digital/UTM systems are all essential for AAMs but do not qualify for AIP funds unless somehow integrated into legacy systems. The FAA has made clear that it will not fund infrastructure involving AAM projects.

Eligibility for AIP grants is heavily dependent on compliance with safety and design standards to meet their safety-first orientation. Innovative concepts such as eVTOL charging, autonomous operations, multimodal hubs, etc. are again, ineligible unless tied to an existing safety standard.

The FAA's public-use requirement is fine for traditional services provided by the state's commercial and general aviation airports. Once again, however, this conflicts with the AAM deployments, which are often private operator led. In addition, some vertiports may be semi-private or may limit access.

Finally, traditional long-term funding horizons – 5-, 10- and 20- year capital projects - facilitate not just FAA traditional financing but also encourage innovative collaborations to produce matching funds. But drone, AAM and other air-transport invocations are moving swiftly; funding beyond 2–5-year cycles is not practical or justifiable.

Impacts on West Virginia

Like many rural states, West Virginia's airports rely almost entirely on AIP grants. Four of the seven commercial service airports have enplanements of under 10,000 (although Morgantown's addition of service to O'Hare may push them over that threshold) limiting the amount of available AIP funding. And most airports have short- to medium-length runways (<3,000 -8,000 ft.), which limits the types of aircraft accessible and which, again, limits qualification for AIP funds. Finally, FAA grants do not accommodate AAM or drone expansion, two of the most forward-thinking economic growth options. While they may fund a runway extension here and there, for the most part, FAA grants help keep West Virginia's airports safe and open, but they do not help them transform.

Beyond the FAA

There are several other federal agencies and programs that can benefit the state's airports' expansion needs.

US Department of Commerce

While they do not fund aviation, they fund jobs and business growth, regional competitiveness and innovation and resilience. For West Virginia aviation, that translates to funding for hangars, business parks (national and international aviation industry and beyond), medical (perhaps combined with funding from the US Department of Health & Human Services) and drone logistics, tourism, energy and technology infrastructure (perhaps combined with funding from the US Department of Energy), and, of course, AAM and emerging aviation ecosystems. For the most part, funding opportunities are provided thorough the US Economic Development Administration (EDA).

Economic Development Administration. Their focus on job-creation and private investment matches particularly well with funding needs for hangars (particularly for new tenants), industrial buildings (education, military, industry), utility extensions, access roads and site preparation, workforce-oriented facilities, planning and feasibility studies, and development of business parks, particularly for aviation, drones and defense. Qualifications and requirements are more flexible than FAA, and they also fund non-aviation specific infrastructure. EDA priorities include rural regions, economically distressed communities, industry diversification and public-private collaborations. Funding must be tied to economic development outcomes, as opposed to aviation outcomes, and partnering or inclusion of local or regional EDA organizations may be required. May also benefit from partnering with contractors and developers.

Specific opportunities within the Department of Commerce include

- EDA planning and capacity grants
  Often overlooked, this funding supports master planning for airport-adjacent land, brownfields reuse planning (collaborative opportunities here with the US Environmental Agency and the WV Brownfields Assistance Centers),[41] financial modeling and administrative organization, and multi-agency coordination and collaboration. *Funding is grant-ready, bond-ready and developer-ready!*

- Tourism, travel and placemaking grants
  Often seen as an export industry and rural development strategy, airport funding fits

[41] The Northern Brownfields Assistance Center at WVU is run by Carrie Staton, who taught a graduate grantwriting course for the former MPA program. Her efforts have been rewarded with millions of dollars in federal and regional funding. She can be reached at carrie.staton@mail.wvu.edu.

here because it supports first impressions, regional gateways, and, of course, access points for outdoor recreation and heritage sites. Tourism combined with aviation provides economic access for often underserved Appalachia. Eligible activities include facilities for charter, scenic and recreational aviation, ground transportation hubs, visitor access infrastructure, and services support tourism marketing-including drones.

- Innovation, Technology and AAM-Adjacent Commerce Tools
    - Technology & innovation programs
    - Manufacturing & supply chain resilience

NOAA and Data Infrastructure. As a part of the Department of Commerce, NOAA funds projects pertaining to weather data, climate resilience, environmental monitoring and drone-based sensing. This can include aviation safety upgrades, drone testbeds, environmental and public health monitoring, catastrophic event rescue, monitoring and assessment, and resilience planning. These grants are easily combined with others within the Department of Commerce and other federal agencies,

Examples. Where the FAA falls short in the state's aviation funding needs, the Department of Commerce can often step in, not just for 'right-now' needs but also for innovative growth opportunities.

Example #1. Funding for hangars needed for industry recruitment would include: an EPA Public Works grant as the primary funding source, combined with a state economic development fund match (or a combination of local, regional, state EDA and even developer or industry contributions). The airport would contribute the land and support the project with private tenant lease(s). An FAA AIP could provide funding for safety items if needed.

Example #2. An outside the fence, AAM/Innovation Zone development would include: EDP Public Works & Planning grants; EPA Brownfields grants for site cleanup if needed; local, regional, state or private innovation funds (possible EDA match); partnerships with WVU, Marshall, National Guard or commercial organization; agreements with private developers and operators.

Department of Defense-Dual-Use Programs. Another little known or used option that matches particularly well with aviation needs, the DOD's dual-use programs fund fuel farms (especially for military-grade fuels); runway, apron and hangar upgrades; and drone testing, ISR, logistics and training facilities. The state's strategic location, particularly for

defense, can be especially attractive to the DOD. Programs include the Defense Community Infrastructure Program (DCIP), National Guard partnerships, and direct, mission-driven investments, especially with specific military units. Moving into the DOD funding realm opens the state and airports for defense capital, not just grants. Liaison with the state's Congressional representatives and senators *may* be helpful once opportunities are identified.

NASA, DOT, & DOE Demonstration & Pilot Grants

These funding sources for proving that new aviation, energy, and mobility systems work (Commerce funding, on the other hand, is for building the permanent infrastructure and jobs once they do).

- National Aeronautics and Space Administration (NASA) funds flight demonstrations, testbeds, simulations and modeling, workforce pilots, and temporary or modular infrastructure. These dollars would be appropriate for hosting AAM or drone testbeds, validating airspace concepts, developing energy and charging systems, education and training pilot programs, and proving rural use cases.

- The US Department of Transportation (DOT) finances operational pilots, safety frameworks, multimodal integration, rural access demonstrations, and data collection and evaluations. Applicable projects include rural mobility pilots, medical or cargo service demonstrations, integration of drone and ground transportation, and first-of-its-kind service models.

- The US Department of Energy grants support pilot programs for charging infrastructure, microgrids, energy storage, SAF and alternative fuels, and grid integration demonstrations. They are ideal for proving eVTOL charging models, testing SAF logistics, building resilient energy hubs, and exploring energy transition options.

Appalachian Regional Commission (ARC)

Finally, the last of the federal resources is the Appalachian Regional Commission. Their mission is to build community capacity and economic development in Appalachia. ARC grants can be best used to fund hangars for workforce-linked activities, such as education and training and job placement with industry organizations and businesses; training facilities, again for workforce development but also military and organizations; and creation of infrastructure that supports diversification from coal and mining activities. As long as the focus is job-related, funds can be requested for drone, electric and AAM air vehicles.

Venture capitalists, angel investors, and private equity firms invest in projects involving the Appalachian Regional Commission (ARC), often working alongside ARC's federal grants. ARC uses its initiatives, such as ARISE and Access to Capita, to leverage private capital, including partnering with groups like Appalachian Investors Alliance to launch micro-venture funds for regional

DEBT FINANCING

Municipal Bonds

When used correctly, municipal bonds can provide a backbone for airports as economic development platforms.

THE WEST VIRGINIA FY2025 ANNUAL COMPREHENSIVE FINANCIAL REPORT

June 30, 2025

Total Primary Government assets: $27.1 billion
Total liabilities: $10.8 billion
Ratio of assets in excess of liabilities: 2.5:1

Current and other assets: $15.1 billion
Total bond indebtedness: $ 3.1 billion
Ratio of current & other assets in excess of total bond debt: 5:1

CREDIT RATINGS
Standard & Poor's: AA-
Fitch: AA

- Bond maturities range from short term (under 1 year) to intermediate (under 10 years, to long term (10-30 years) and often have call features that allow the issuer to pay off (call-in) the debt earlier, on scheduled call dates.
- Bonds require identified a revenue stream or other specified means for payment of debt service and eventual payoff.
- As interest rates decline, projects can be refinanced to lower debt service costs, replacing the original bonds.
- West Viginia's low debt ratio[42] and strong credit rating will enable issuers to keep interest rates lower and encourage investor interest. Exemption from state tax is attractive to resident buyers.

[42] According to the state's FY2025 Annual Comprehensive Financial Report (CAFR), as of June 30, 2025, the balance sheet showed Total Primary Government assets of $27.1 billion and total liabilities of $10.8 billion, for a ration of 2.5:1. For every dollar in liabilities, the state had $2.50 in assets to cover them. Current and other assets of $15.1 billion was almost five times (4.9:1) total bond indebtedness of $3.1 billion. The change in all categories from 2024 to 2025 is negligible, with slight increases in assets and minor decreases in debt. There is considerable capacity for the state to take on or guarantee additional debt without impacting its credit rating. https://finance.wv.gov/media/37437/download?inline.

Using debt financing can enable airports to shift from grant-seeking to capital planning. There are a variety of ways to do this.

Revenue Bonds (Airport or Development Authority)

Revenue bonds are often issued by airport authorities, or city/county development authority, although they could be issued by the West Virginia EDA or DOT in whole or in collaboration with other municipalities, agencies, or developers. *The key requirement is that there must be a dedicated revenue stream*.

These bonds can best be used to everything from shopping malls to hangars (with signed leases) and fuel farms (with throughput contracts) to medical aviation facilities and drone or logistics hubs. They are idea for collaborative relationships with developers, drone, AAM, and satellite companies, public universities, military organizations, etc. So many options!

Industrial Development Bonds

These bonds are used when an airport authority wants to issue funding on behalf of a private user. Unlike revenue bonds, industrial development bonds keep the debt off the airport's balance sheet – the airport functions as the facilitator, not the borrower. This works well with private tenants (such as a company that wants a large 'corporate' hangar for itself). They also pair well with foundations and community development financial institutions (CDFIs -see below). Like revenue bonds, best uses for this funding includes private hangars, biofuel facilities, drone logistics buildings, and medical aviation operators.

General Obligation (GO) Bonds

GOs are backed by a taxing authority, such as a state agency, or county or municipal government (if allowed in WV), or a regulatory body with taxing authority. They are politically challenging because of the tax increase but could be more palatable if framed from an emergency access or similar perspective. GO bonds used to fund medical aviation faculties could be combined with a fractional tax increase on health insurers, for example. This funding option is best used for development of access roads and other infrastructure, flood control, public safety and emergency medical services.

Private Activity Bonds (PABs)

PABs are a unique form of municipal bond in that they are authorized under federal law and overseen by the IRS, but issued by a county or municipal government, airport authority or EDA, or similar authority. The are specifically for projects used primarily by private companies to serve a recognized public purpose. For example, a housing authority might use PABs to finance a developer's public housing project. The tax-exempt status of these bonds is especially attractive to developers because of the lower interest rates.

Airports sit at the **intersection of public infrastructure and private use**, which is exactly where PABs are meant to operate. Ideal uses include private hangars, cargo and logistics facilities, fuel farms, MRO facilities, medical aviation operators, drone and AAM facilities, and biofuel production and storage.

Airport Revenue Bonds

As the name implies, these bonds are backed by airport revenues instead of taxes or project revenues. These bonds would likely be a significant challenge for the state's airport as their operating margins are slim at best. They are commonly used for hangars, fuel infrastructure, cargo and distribution facilities, medical aviation facilities, and shared drone or logistics hubs- projects that create predictable revenue.

Lease revenue bonds.

Again, as the name implies, these bonds are backed by lease payments, as opposed to aviation revenues (at times a distinction without a difference). These bonds are especially beneficial in lieu of restrictive FAA AIP requirements, and for facilities that "are outside the fence." Examples include build-to-suit hangars, medical aviation tenants, and university or military/guard facilities.

Green (Sustainability) Bonds

This funding mechanism is not a separate category of bonds, per se; it is actually a use-of-proceeds designation. These bonds are ideal for projects that would attract ESG investors, conservationists and climate preservationists, eco-tourism, organic farms, etc., and pair well with USDA, Commerce, DOE and EPA grants. Best uses include energy systems and biofuels, charging infrastructure, microgrids, brownfields reclamation, and climate-resilient facilities.

In a nutshell, *private activity bonds* (PABs) are ideal for general aviation facilities' funding for private aviation (hangers, training etc.), logistics, medical & emergency services, drones, and energy uses. *Revenue and lease bonds* fund shared or common-use facilities. *Industrial development bonds (IDBs)* allow airports to keep debt off their balance sheets; *special districts* isolate risk and offer flexible financing; *tax-increment financing (TIF)* pays for the "boring but essential" infrastructure that supports everything else; and *green bonds* add dollars for "outside-the-fence" projects.

Other Debt-related Advantages & Opportunities

Special Districts

This funding option is uniquely powerful and surprisingly underused. In this case, a special district is legally defined and authorized to level bonds or assessments, issue bonds, and

own infrastructure. Some examples of special districts include airport development districts, transportation improvement districts, industrial or logistics, and some utilities. They are particularly advantageous because the airports don't carry all the political or financial risk and can be used to fund outside general airport accounts, ring fencing risks,[43] airport adjacent development, infrastructure, logistics parks, and drone and AAM districts.

Tax Increment Financing (TIF)

Tax increment financing is a widely used economic development tool that allows local governments to freeze property tax rates at the start of development within the TIF district and use future increases in property tax revenue from new development or revitalization to fund public improvements, infrastructure (roads, sewers, etc.), or incentives. Essentially, it is borrowing from anticipated tax revenue gains to spur needed development. TIF districts are established for a designated period of time, generally 20 to 30 years, and it is rare for a community to close a TIF even after it has expired (usually they are extended or reviewed for another specified period). Airports could help facilitate TIF districts between developers and local governments or EDAs to realize needed improvements to areas typically "outside the fence." Best uses include upgrades to previously underused land, development of airport-adjacent business and industrial parks, and brownfields or redevelopment areas. Typical projects include infrastructure, roads, site prep, and structured pads.

Because airport property is often tax-exempt, TIFs often require county and municipal cooperation. They best used for private development, and while TIFs don't fund runways, they can be used to fund everything around them.

Community Development Financial Institutions (CDFIs)

CDFIs are mission-driven, community development-oriented lenders that are certified by the US Treasury through their national CDFI fund. They are not to be confused with commercial banks or local and community commercial institutions. They were created to finance projects that are not ready for prime-time commercial financing. Most importantly, developers, non-profits or special purpose districts can replace airports as borrowers.

Unlike bonds, CDFIs can take on more risk and accept lower rates of return. Consequently, their portfolios can include projects that are too early, complex, or rural for conventional banks, clearly tied to jobs, health care. resilience, or equity, or economic viable but outside the norm of traditional funding or bond debt.

[43] Ring-fencing legally separates the airport's finances from its parent company or owner, preventing the owner's financial weaknesses from hurting the airport's credit. A-1 Fence. 2025. The Evolution of Airport Fence: From Bas ic Barriers to Advanced Security Fencing Solutions. Jun 27. https://www.a-1fenceproducts.com/blog/the-evolution-of-airport-security-fencing/

CDFIs don't replace bonds; they simply make bond funding possible later by reducing the perceived risk for bondholders. They do this by acting as bridge financing or gap debt, functioning as subordinate debt to reduce overall project risk or acting as loan guarantors. They effectively bridge the gap for projects that would be considered "too risky for bonds" and "too big for grants."

CDFIs are great for facilities. Such as hangars, industrial buildings and parks, medical aviation, training and workforce centers; infrastructure, including as utilities and broadband, energy systems , fuel storage and side prep; and early-stage projects such gap financing and bridge loans.

OTHER OPTIONS

While private equity is ubiquitous today, investor groups and angel investors demand projects large enough to make the return commiserate with the risk. The challenge for most of the projects considered here is that the amount needed is too small for private capital but too big for banks, fintech, and other lenders. However, it is possible to attract private investors by leveraging other, or a combination of other financing arrangements. For those reasons, private equity is not considered further in this report.

That said, the Multistate Collaboration is developing a funding model that creates access to capital via scale. The aim is to create harmonizing sustainable funding models create markets.

In addition to the more traditional sources listed above, there are a host of other sources that include less well-known but viable federal sources such as:

- FEMA Mitigation & Resilience Funding (if still available)
- US Treasury Capital Program
- Health-System & Public Health Capital
- State & Federal Public Health Infrastructure Funds
- Health-Systems Capital & Community Benefit Spending
- Defense-adjacent funds via the National Guard Resilience & Dual Use Funds
- EPA Conservation and Watershed & Land Reuse Funds

State agencies have designated project and discretionary funds, as well as working relationships with federal agencies. Working with them to put together funding requests would enable them to tap into their unique combination of funding streams. State executive funds also include pots of discretionary quiet money" such as energy transition

funds, workforce capital funds, economic resilience and site readiness funds, all of which could be combined with other funding sources to fulfill needs.

Finally, let's not forget the philanthropic world. Foundations do not provide charity; they offer strategic capital. They do not general fund airport projects, but they will fund projects at airports that fit with their operational objectives and programs.

Foundations can participate in airport and community economic development endeavors through program related investments (PRIs), such as grants, low-interest loans or recoverable grants or loans (used for pilots, demonstrations, etc. and paid back only after the project is successful). Like CDFIs, PRIs can pave the way for large volume bond funding and/or grants, reduce the amounts needed for completion, and add to project legitimacy for funders and investors. Foundations also offer capacity and planning grants; they are often overlooked or disregarded but can be essential for project initiation activities such as financial modeling, bond preparation, legal needs, and community engagement.

Types of foundations and their interest in airport development include:

- Health & Rural Access Foundations

  These organizations fund medical access infrastructure, rural health logistics, emergency preparedness, and medical drones, and medical hangars, EMS staging and organ transport
    - Robert Wood Johnson Foundation
    - Kresge Foundation
    - The Commonwealth Fund

- Appalachian and Place-Based Foundations
    - Appalachian Regional Funders Network
    - Benedum Foundation
    - The Heinz Endowments

  These organizations fund workforce transition and training and related infrastructure, brownfields reuse, and rural resilience, and structures inside and outside the fence needed to accomplish these things.

- Climate, Energy & Resilience Foundations
    - Bloomberg Philanthropies
    - Rockefeller Foundation
    - US Energy Foundation

  These organizations fund energy transition, climate resilience, and disaster preparedness and would be open to funding AAM charging pilots, perhaps biofuels development and infrastructure.

Funding requests to these foundations are most likely to be successful if partnered with a nonprofit organization or development authority. The request should focus how the project will advance the health, workforce, climate or equity missions of the foundations, and the funds should be used for early development or bridge/gap funding. Ideally, these funds should be combined with grant, bond, CDFI or other public funds.

RECAP: MIX & MATCH

Each of the funding opportunities discussed above can be applied individually as well as in uniquely variable combinations to best suit development needs. The table below compares grants, bonds and CDFIs; toss in the lesser-known sources and there are ways to fund every imaginable project.

COMPARISON OF FUNDING OPTIONS			
FEATURE	GRANTS	BONDS	CDFIs
Risk tolerance	N/A	Low–moderate	High
Speed	Slow	Slow	Moderate–fast
Repayment	No	Yes	Yes
Flexibility	Medium	Low	High
Best stage	Any	Mid–late	Early mid
Best airport uses	Planning; pilots & demonstrations; site prep; workforce & training; brownfields cleanup; safety & access improvements	Large permanent assets; common-use hangars; fuel farms; medical or logistics hubs with committed revenue	Early hangars; drone & medical facilities; workforce centers; energy systems; gap & bridge financing; airport-adjacent development

Examples of how these funding instruments might be combined to fund various projects are offered here to show how they might work in real time.

Example #1: Creation of a Drone, Medical & Logistics Park

Funding sources:

- A grant from EPA/ARC/WV Brownfields Assistance Center is used for site cleanup

- A TIF district is established to support construction of roads & utilities
- PABs or IDBs are used to facilitate private development projects
- CDFI funding (as subordinate debt) is used to act provide gap funding between receipt of the various funding streams.
- Add in a foundation program related investment (PRI) for less restricted, subordinated debt or equity investment

Example #2: Creation of a Fuel, Energy & AAM Support Zone

Funding sources:

- Lease revenue bonds for shared facilities
- Green bond designation funds
- DOE or USDA grants for energy and biofuels
- Partnership with the local utility
- Special district designation
- LNG and fuel cells

Example #3: Tourism & Outdoor Access Aviation (charter, drone, etc.)

Funding sources:

- Revenue bonds, paid for with charter fees
- CDFI tourism loan
- Foundation rural prosperity grant
- EDA public works grant
- State tourism funds
- Rural Health Transportation Program
- CMS Reimbursement

Example #4: Medical & Emergency Aviation Hub

Funding sources:

- Revenue bonds, backed by health system contracts
- CDFI subordinate loan
- Foundation PRI (health equity or rural access)
- State or FEMA match
- FAA AIP for lighting, safety

Example #5: Hangars & Industry Recruitment

Funding sources:

- Investment development bonds, backed by tenant contracts
- CDFI predevelopment loan (*de-risks the project *before* bonds are issued)
- Foundation workforce grant/PRI
- EDA grant for workforce/jobs & utilities
- Airport land contribution

COLLABORATIONS & PARTNERSHIPS

For state agencies, joining forces with other agencies, non-profit organizations and other community organizations allows them to turn airports into shared infrastructure instead of siloed assets. The most successful projects are those where multiple agencies need the same asset, such as infrastructure (utilities, broadband, etc.) or share the same goal, such as workforce development and advancement.

State Agencies

Airports can partner with most state agencies and executive offices to develop shared infrastructure and EDA projects and achieve shared goals. Combining forces makes the best use of all resources, often frees up resources for all parties for other uses, and encourages innovation. Tech, media, manufacturing and other industries encourage collaboration between personnel from differing offices and areas of expertise to encourage innovative thinking. Some ideas for mutually beneficial collaborations include:

Transportation & infrastructure

- West Virginia Department of Transportation (beyond the Division of Multimodal Transportation)
- Shared interests: access roads, bridge upgrades, freight connectivity, multimodal hubs
  - Upgrades facilitate emergency access, cargo, freight & logistics, disaster response
  - Moves “airport project” to state infrastructure assets

Health & emergency agencies

- West Virgina Department of Health and Human Services
- Shared interests: EMS & organ transport, disaster medical staging, rural health capacity
  - Facilitates co-funded helipads, drone & AAM hubs and medical logistics facilities
  - Mission urgency helps to strengthen funding applications

Emergency management & Homeland Security

- West Virginia Emergency Management Division
- Shared interests: disaster preparedness & response, political support for response needs, federal pass-through dollars from FEMA and Congressional appropriations
  - Facilitates drone & AAM staging hubs and charging stations, training, maintenance, evacuation and response hub, and supply logistics

National Guard & Defense partners

- West Virgina National Guard, DOD and military partners
- Shared interests: dual-use hangers, fuel farms, secure/satellite communications, drone

& AAM defense staging training, storage and maintenance facilities
National Guard partnerships legitimize DOD funding, encourages long-term investment in facilities and transport vehicles

Workforce, education & economic development

West Virgina Department of Economic Development
Shared interests: tenant recruitment, workforce education and training, site readiness
Allows hangars to become job engines

Facilitates extended/enhanced partnerships with universities and community colleges, workforce boards, and local workforce promotion and economic development alliances. An educated workforce makes it easier for municipalities to attract new businesses

Community-Level Partnerships

Many airports have established relationships with city and county governments (i.e., Monongalia County Development Authority) and/or local economic development, community planning, or other similar entities. Collaborating with these groups can help airports develop needed zoning alignments, eligibility for brownfields and EDA assistance, and facilitate community buy-in for proposed expansions.

REGIONAL PLANNING & DEVELOPMENT COUNCILS (RPCS)

West Virginia has 11 Regional Planning and Development Councils, each covering a defined multi-county region. They perform several services to promote economic development in the region.

- Maintain the region's Comprehensive Economic Development Strategy (CEDS)
- Serve as the Economic Development District (EDD) for the Economic Development Administration
- Administer or support grants
- Partner with airports, counties, and developers

RPCs help to facilitate airport developments in various ways

- Get projects listed in the CEDS (huge for EDA)
- Conduct feasibility or site-readiness studies
- Coordinate brownfields reuse
- Align workforce, transportation, and land-use plans
- Support grant applications and compliance

RPCs support assures funders of airports' long-term capacity and credibility

Community-oriented non-profit organizations also work closely with local development offices and businesses to promote economic development. For example, Downtown Fairmont and The Morgantown Area Partnership work with city and county planning and development authorities and prospective businesses to facilitate funding for economic development projects. It should be noted that when local and community organizations

work together, public dollars can go farther. "Research reveals interconnected service networks deliver cost savings and lower tax burdens for residents."[44]

Regional Planning & Development Councils (RPCs)

There are eleven RPCs throughout the state,[45] all designed to work with local governments, city and county economic development authorities, and non-profit organizations. They can be instrumental for airports in helping to coordinate and facilitate funding for expansion and development projects. Projects with RPC backing often move faster and face less resistance than those without.

TIP Funds. Transportation Improvement Program (TIP) funds are awarded and administered by the US Department of Transportation. They fund a federally mandated, multi-year, prioritized list of regional transportation projects—including highways, transit, and pedestrian facilities—scheduled for federal funding over a 4- to 6-year period. Developed by Metropolitan Planning Organizations (MPOs), they are administered by RPCs to fund short-term, actionable capital plans that implements long-range transportation goals.

[44] When counties team up, tax dollars go further. 2005. Public Budgeting & Finance News, Oct 23. https://www.pbafnews.com/p/when-counties-team-up-tax-dollars.

[45] The 11 West Virginia RPCs:

1. **Belomar Regional Council**, Counties: Marshall, Ohio, Brooke, Hancock
2. **Brooke-Hancock-Jefferson Metropolitan Planning Commission**, often functions with Belomar for planning activities
3. **Central Appalachian Regional Network (CARN)**, Counties: Boone, Clay, Kanawha, Putnam
4. **Fayette County Planning Commission**, Serves a specialized regional planning role
5. **Greater Kanawha Valley Foundation / Planning Region**, often coordinated with CARN for regional development)
6. **Hatfield-McCoy Regional Recreation Authority**, special-purpose regional authority; overlaps RPDC functions in southern WV
7. **Mid-Ohio Valley Regional Council**, Counties: Calhoun, Jackson, Pleasants, Ritchie, Roane, Tyler, Wirt, Wood
8. **Mountain Heart Community Services**. Counties: Barbour, Randolph, Taylor, Tucker
9. **Region VI Planning & Development Council**, Counties: Fayette, Greenbrier, Nicholas, Pocahontas, Webster
10. **Region VII Planning & Development Council**, Counties: Braxton, Clay, Lewis, Upshur
11. **Region IX Planning & Development Council**, Counties: Logan, McDowell, Mercer, Mingo, Raleigh, Summers, Wyoming

These program funds are flexible; they typically fund projects that do not fit into other FAA or DOT categories.[46] Information about West Virginia's 2023-2028 Statewide Transportation Improvement Program (STIP) can be found at https://transportation.wv.gov/highways/Programming/STIP/Pages/STIP-2023-2028.aspx.

Hospitals & Health Systems

Most hospitals and health systems don't own aviation assets but do need access to them, particularly for emergency transport. They are a prime candidate for AAM development, as AAMs offer the capacity for emergency and organ transport throughout rural West Virginia. Like RPCs, collaborations with health systems often add assurance for funders.

Some airports are ahead of the collaborative game here. For example, to take make the most of their developable land, the Mid-Ohio Valley Regional Airport and the Wood County Airport Authority formed an economic development committee to recruit MRO (maintenance, repair and overhaul) companies in the U.S and abroad that are looking for room to provide support for wide body aircraft and other aviation industry needs. However, they will need to install the necessary infrastructure to fully prepare the property for tenants and are looking for grants to facilitate that. They may want to look at private partnerships, as well.

Developers

Developers are risk-takers with balance sheets. They know how to finance projects, project revenues and profits, and determine the time and resources needed for completion. They manage construction risk and recruit tenants. These attributes make them perfect partners for airports looking to add hangers, develop industrial or business parks, renovate facilities, etc. What airports must bring to the table are site control/ownership and utility access, community buy-in, anchor tenants (i.e., aviation industry, military, university/education, EMS., etc.) if possible, and other funding support (i.e., grants, bond funding, etc.) if available. These contributions lessen the risk for developers, making the projects more attractive.

For airports, best practices include the use of development authorities, non-profit development entitles or special-purpose vehicles. These enable the airport to accept federal, state, CDFI, and foundation funds, contract with developers, and helps to mitigate risk for the airport. Using bonds to fund developer partnerships is common in other industries; the administrative structure differs from the EDA model but can be easily used

[46] For example, the Transportation Improvement Program (TIP) for WV Regional Intergovernmental Council – Region 3 can be found here: https://wvregion3.org/programs.

for aviation expansion. In all cases, the advantages of partnering with developers is that they bring expertise, capital contributions, and execution.

Examples of ways partnerships might be constructed include:
Example #1: Ground lease & private development

- The airport leases the land to the developer (30-50 year lease)
- The developer builds and operates the facility
- The airport receives lease revenue, indirect economic activity, and basis for recruitment for additional growth

Best for hangars, cargo/freight facilities, drone facilities, medial aviation

Example #2: Master developer for "outside the fence" property

- Developer plans and phases multiple uses
- Airport retains land control
- Creation of mixed-use aviation ecosystem

Example #3: Developing a cargo/freight hub

- Airports may offer debt guarantees of equity pledges to attract developers to reassure funders or bond investors [47]

Summary

These ideas for collaboration are not limited to categorization. Like the funding options, there are many more entities and opportunities to partner with, and they can all be mixed and matched in unlimited ways. Combining them with the variety of funding alternatives makes for exponential ways to realize airport, aviation industry, and community and regional economic growth. The million-dollar question is, what next?

[47] https://airportscouncil.org/wp-content/uploads/2020/03/CHAPTER-2-DEVELOPING-AN-AIR-CARGO-MARKET.pdf

NEXT STEPS

The information presented in this report offers a smorgasbord of funding sources and development partners and provides basic examples of how they might be combined. Determining how to proceed would be best informed by first prioritizing the proposed and potential projects. Given the diversity and complexity of the projects and the options for bringing them to fruition, there is a lot to consider throughout the prioritization process. And while not emphasized, time may also be a factor, based on project viability, community need and buy-in, resource needs, funding probability, and estimated time for completion would

For example, the growth of AAM is extremely competitive but airports may not be quite ready to identify it as a priority project - yet delayed implementation may ultimately preclude the state from any significant industry participation. And airports with lengthily hangar-rental waiting lists will want to move quickly on hangar construction to prevent clients from eventually looking for another facility that can accommodate them.

WVDOT management of aviation policies and activities across the state has been limited to date. Before moving forward with ideas in this report, leaders are advised to draft a strategic plan that identifies the Department's priorities and policies for aviation growth within the state. Using that as a foundational document, an ideal (basic) operationalization of this report might progress as follows:

Step 1 The Division of Multimodal Transportation Facilities (DMTF) would *meet with airport managers to identify their top priority projects.*

Step 2 Division of Multimodal Transportation Facilities (DMTF) would *meet with airline carriers about potential routes and demand.*

Step 3

DMTF leaders, in consultation with manager/consultant who will ultimately shepherd the chosen projects, would review and pare the list to distinguish those that could be combined or are complementary, with the ultimate goal of *pinpointing the projects that are the most imperative, have the most likelihood of success, and would have the greatest direct and indirect economic impact.*

Step 4

Choose just two or three diverse projects to move forward. Perhaps one hanger construction, one AAM project, and one fuel farm or emergency medical transport facility (complementary to the AAM project)

Step 5

With the manager/consultant, *design strategic plans for each project.* Identify community support and requirements, appropriate funding sources and contact points (perhaps contract with a grantwriter), potential partners, resources needed, and steps for completion. Recognize contingency plans. Develop a timeline for completion. Coordinate all continually with airport managers, city/county/region officials, grantors, partners, etc.

Step 6

Initiate plans, periodically assess and adjust for contingencies and time changes as needed.

Step 7

Assess project process strengths and weaknesses. Develop best practices for future projects

Step 8

Celebrate completion. This could be several months to several years after initiation.

Step 9

On to next projects - *Step 1***.**