



Washington Aviation Economic Impact Study Executive Summary

Connecting people and goods. Enhancing prosperity. July 2020



Executive Summary

Washington's Airports Support the **ECONOMIC VITALITY**

of our State

STATEWIDE BENEFITS OF AVIATION

WSDOT

Statewide, Washington's 134 public-use airports annually support 407,042 jobs and generate \$26.8 billion in labor income and \$107.0 billion in business revenues (economic impact). This money is generated by the millions of domestic and international visitors who travel to our state each year as well as the diverse economic activities occurring directly on airport propertyincluding much of the state's thriving aerospace industry.

As the link that connects people and businesses with destinations around the globe, Washington's airports are a keystone of the state's economic prosperity and continue to support sustained economic growth across our communities.

Washington has been a hub of aviation innovation for well over a century. The state witnessed its first airplane flight in 1910 during an exhibition at of the newly-established University of Washington. The Boeing Company was incorporated in 1917 and soon began building floatplanes on the shores of Lake Union for U.S. wartime efforts. Today, over 90 percent of domestically produced commercial aircraft are manufactured in Washington.

The 134 public-use airports in the Washington aviation system support a host of commercial service and general aviation (GA) activities that enhance the state's economic vitality, mobility, access, and overall quality of life. The Seattle-Tacoma International Airport (SEA) is one of busiest airports in the U.S., offering passengers direct connections to over 90 domestic and 20 international destinations. GA airports including a network of seaplane bases provide connectivity, emergency access, and mobility across the state and islands off our western coastline. Washington airports handle over 556,000 metric tons of air cargo each

STATEWIDE IMPACTS

Jobs: 407,042

- Labor Income: \$26.8 billion
- (\mathbf{A}) Business Revenues: \$107.0 billion

year valued at over \$46.7 billion. Airports also support numerous other activities including agricultural spraying, emergency medical transport, pilot training, aerial wildland firefighting, and search and rescue operations.

To understand the economic contribution of Washington's airport system, the Washington State Department of Transportation (WSDOT) Aviation Division conducted the statewide Aviation Economic Impact Study (AEIS). Completed in early 2020, this study measured the annual economic impact that airports provide to local communities, geographic regions, and statewide. The AEIS looks not only at the aviation-related landscape today, but ahead to the cutting-edge emerging technologies that promise to shape the world of tomorrow.

The Washington AEIS offers a comprehensive look into how airports contribute to our state and provides a useful tool for airports and WSDOT Aviation Division in communicating the immense value they bring to our world.

The data used in this study is based on 2018 information. Since the start of the study, many notable changes took place within the aviation system including the highly-successful start of scheduled commercial passenger service at Snohomish County Airport (Paine Field) in Everett. Additionally, the world is responding to COVID-19 as this study heads to publication. The lasting impacts of COVID-19 are difficult to determine at this point. It is safe to assume that aviation will continue to be an important contributor to the state's economy and the transportation system as we address and recover from the virus during this unprecedented time in our history.





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Study Approach

Economic impact is quantified by first calculating the direct effects of on-airport activity and visitor spending, then analyzing how these effects continue to generate money as they flow through the economy. Direct on-airport impacts are comprised of on-airport employment, business activities conducted by airport tenants, and capital improvement expenditures. As gateways into Washington, airports also generate significant economic impacts associated with direct visitor spending in industries such as lodging, restaurants, retail, and entertainment.

Supplier sales and the re-spending of worker income (indirect and induced impacts, respectively) are two streams often referred to as the multiplier effects. Supplier sales occur when on-airport businesses purchase goods and services from other Washington businesses. The re-spending of worker income occurs when on-airport employees spend their wages in the state. Multiplier impacts are calculated both on a regional level, which reflects supplier sales and re-spending of income within a region, as well as the impacts that are generated at the statewide level from these same sales and respending throughout the state.

Total economic impacts are the sum of direct, supplier sales, and the re-spending of worker income, which are then expressed in terms of jobs, labor income, value added, and business revenues.



Impacts by Type



The economic contribution of airport administration, business tenants, and capital expenditures generate onairport economic impacts. Washington's airports function as centers for on-airport employment by providing services to airlines, airline passengers, and GA pilots and their aircraft. Additionally, many airports host aviation and non-aviation tenants that rely on the facility's infrastructure to conduct business operations. Airport capital expenditures support safe and efficient operations and, in some cases, expanded operational capacity.

Visitor Spending

Out of state and international visitors often rely on Washington's network of commercial service and GA airports as a gateway for tourism and to conduct business activities. In 2018, approximately 9.4 million out of state and international passengers arrived in Washington via the state's 10 Primary commercial service airports and commercial seaplane bases, with an estimated additional 997,000 visitors arriving via GA. Visitor spending economic impacts are attributable to visitors' spending on goods and services in hospitality-related businesses, as well as jobs and payroll supported by those expenditures.

Total Economic Impacts by Airport

Associated City	Airport Name	FAA ID	Jobs	Labor Income (\$)	Value Added (\$)	Business Revenues (\$)		
	Scheduled Commercial Service*							
Bellingham	Bellingham International	BLI	2,940	\$159,295,000	\$271,160,000	\$471,435,000		
East Wenatchee	Pangborn Memorial	EAT	1,248	\$67,192,000	\$110,001,000	\$253,765,000		
Friday Harbor	Friday Harbor	FHR	471	\$30,541,000	\$54,945,000	\$96,840,000		
Pasco	Tri-Cities	PSC	2,194	\$99,128,000	\$173,516,000	\$290,603,000		
Pullman	Pullman/Moscow Regional	PUW	907	\$45,889,000	\$74,743,000	\$130,247,000		
Seattle	Boeing Field/King County International	BFI	18,679	\$1,285,589,000	\$1,723,302,000	\$3,039,819,000		
Seattle	Sea-Tac International**	SEA	151,400	\$7,099,500,000	N/A	\$22,477,900,000		
Spokane	Spokane International (Geiger Field)	GEG	11,566	\$548,693,000	\$936,832,000	\$1,551,346,000		
Walla Walla	Walla Walla Regional	ALW	1,304	\$68,911,000	\$125,648,000	\$238,306,000		
Yakima	Yakima Air Terminal (McAllister Field)	YKM	2,366	\$161,172,000	\$289,198,000	\$591,034,000		

Notes: *Snohomish County (Paine Field) began scheduled commercial passenger service in 2019 after the 2018 study year of the Washington AEIA. As such, the airport is included in the General Aviation section on the following page. **The economic impact of Seattle-Tacoma International Airport (SEA) was obtained from the "Sea-Tac International Airport Economic Impacts" study (Community Attributes, Inc., January 2018) conducted by the Port of Seattle. This study did not calculate value added; as a result this metric is not reported at the statewide level in the Washington AEIS.

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Data Sources and Validation

The AEIS used numerous sources to gather data and employed multiple guality control techniques to ensure the data modeled in the AEIS was accurate and comprehensive. Primary sources included airport manager and business tenant surveys to obtain key information about various airport metrics. Secondary sources included the Federal Aviation Administration. U.S. Census Bureau. U.S. Bureau of Economic Analysis, and U.S. Bureau of Labor Statistics. Supplier sales and the re-spending of worker income were calculated using IMPLAN, an industry-leading economic modeling platform. Data inputs were distributed to every airport for validation prior to calculating total impacts to ensure data was accurate and comprehensive. All analyses reflect a 2018 baseline year.

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IMPACTS BY AIRPORT

Associated City	Airport Name	FAA ID	Jobs	Labor Income (\$)	Value Added (\$)	Business Revenues (\$)	
General Aviation							
Anacortes	Anacortes	74S	27	\$1,514,000	\$2,816,000	\$5,783,000	
Anacortes	Skyline SPB	21H	12	\$859,000	\$1,175,000	\$1,985,000	
Anatone	Rogersburg State	D69	1	\$14,000	\$19,000	\$33,000	
Arlington	Arlington Municipal	AWO	2,621	\$164,090,000	\$357,267,000	\$667,044,000	
Auburn	Auburn Municipal	S50	232	\$14,171,000	\$24,002,000	\$43,137,000	
Bandera	Bandera State	4W0	1	\$28,000	\$39,000	\$66,000	
Battle Ground	Goheen Field	W52	1	\$11,000	\$17,000	\$29,000	
Battle Ground	Cedars North Airpark	W58	1	\$11,000	\$17,000	\$29,000	
Bellingham	Floathaven SPB	0W7	21	\$1,455,000	\$2,438,000	\$5,261,000	
Bremerton	Bremerton National	PWT	4,532	\$311,014,000	\$466,252,000	\$938,464,000	
Brewster	Anderson Field	S97	8	\$426,000	\$653,000	\$1,161,000	
Burlington	Skagit Regional	BVS	326	\$22,397,000	\$37,494,000	\$66,507,000	
Camas	Grove Field	1W1	22	\$1,814,000	\$3,262,000	\$5,822,000	
Cashmere	Cashmere-Dryden	8S2	10	\$623,000	\$1,052,000	\$2,282,000	
Chehalis	Chehalis-Centralia	CLS	1,658	\$68,050,000	\$115,393,000	\$186,473,000	
Chelan	Lake Chelan	S10	51	\$1,905,000	\$3,241,000	\$6,639,000	
Chewelah	Chewelah Municipal	1S9	5	\$324,000	\$470,000	\$825,000	
Clayton	Cross Winds	C72	2	\$150,000	\$205,000	\$346,000	
Cle Elum	De Vere Field	2W1	5	\$315,000	\$454,000	\$796,000	
Cle Elum	Cle Elum Municipal	S93	3	\$144,000	\$227,000	\$392,000	
Colfax	Port of Whitman Business Air Center	S94	45	\$2,206,000	\$3,701,000	\$7,870,000	
Colfax	Lower Granite State	00W	1	\$17,000	\$23,000	\$40,000	
College Place	Martin Field	S95	10	\$600,000	\$854,000	\$1,477,000	
Colville	Colville Municipal	63S	3	\$109,000	\$170,000	\$288,000	
Concrete	Mears Field	3W5	11	\$374,000	\$660,000	\$1,166,000	
Copalis Beach	Copalis State	S16	1	\$29,000	\$42,000	\$71,000	
Dalles, OR	Columbia Gorge Regional/ The Dalles Municipal	DLS	254	\$20,361,000	\$36,980,000	\$66,238,000	
Darrington	Darrington Municipal	1S2	1	\$38,000	\$58,000	\$101,000	
Davenport	Davenport Municipal	68S	7	\$252,000	\$384,000	\$689,000	
Deer Park	Deer Park Municipal	DEW	89	\$3,381,000	\$5,711,000	\$9,541,000	
Easton	Easton State	ESW	1	\$30,000	\$41,000	\$71,000	
Eastsound	Orcas Island	ORS	83	\$5,056,000	\$8,799,000	\$15,506,000	
Eatonville	Swanson Field	2W3	16	\$1,102,000	\$2,087,000	\$4,379,000	
Electric City	Grand Coulee Dam	3W7	8	\$281,000	\$437,000	\$753,000	
Ellensburg	Bowers Field	ELN	214	\$11,898,000	\$20,277,000	\$39,554,000	

INFACTS DI AIRFORT							
Associated City	Airport Name	FAA ID	Jobs	Labor Income (\$)	Value Added (\$)	Business Revenues (\$)	
Elma	Elma Municipal	4W8	11	\$615.000	\$926.000	\$1.585.000	
Ephrata	Ephrata Municipal	EPH	88	\$5,198,000	\$8,508,000	\$15,237,000	
Everett*	Snohomish County (Paine Field)	PAE	158,227	\$13,039,480,000	\$27,149,486,000	\$59,915,294,000	
Forks	Quillayute	UIL	47	\$2,816,000	\$4,710,000	\$7,498,000	
Forks	Forks Municipal	S18	4	\$124,000	\$198,000	\$337,000	
Friday Harbor	Friday Harbor SPB	W33	43	\$3,154,000	\$4,330,000	\$7,312,000	
Goldendale	Goldendale Municipal	S20	1	\$4,000	\$6,000	\$11,000	
Greenwater	Ranger Creek State	21W	1	\$34,000	\$50,000	\$85,000	
Hoquiam	Bowerman Field	HQM	68	\$3,189,000	\$5,277,000	\$8,484,000	
Ilwaco	Port of Ilwaco	7W1	1	\$8,000	\$14,000	\$23,000	
lone	Ione Municipal	S23	3	\$40,000	\$65,000	\$111,000	
Kahlotus	Lower Monumental State	W09	1	\$26,000	\$36,000	\$61,000	
Kelso	Southwest Washington Regional	KLS	113	\$8,291,000	\$15,277,000	\$27,289,000	
Kenmore	Kenmore Air Harbor Inc.	S60	289	\$16,643,000	\$25,199,000	\$41,718,000	
Kent	Norman Grier Field (Crest Airpark)	S36	106	\$5,115,000	\$7,754,000	\$13,002,000	
Lakewood	American Lake SPB	W37	1	\$5,000	\$8,000	\$14,000	
Langley	Whidbey Airpark	W10	22	\$1,503,000	\$2,828,000	\$5,103,000	
Laurier	Avey Field	69S	1	\$6,000	\$10,000	\$18,000	
Leavenworth	Lake Wenatchee State	27W	1	\$28,000	\$37,000	\$60,000	
Lester	Lester State	15S	1	\$12,000	\$17,000	\$28,000	
Lind	Lind Municipal	0S0	7	\$349,000	\$423,000	\$581,000	
Lopez	Lopez Island	S31	11	\$554,000	\$863,000	\$1,605,000	
Lynden	Lynden Municipal Airport- Jansen Field	38W	5	\$265,000	\$384,000	\$646,000	
Mansfield	Mansfield	8W3	29	\$1,610,000	\$2,419,000	\$5,687,000	
Mattawa	Desert Aire	M94	44	\$3,636,000	\$4,713,000	\$7,671,000	
Mazama	Lost River	W12	2	\$187,000	\$243,000	\$397,000	
Mead	Mead Flying Service	70S	11	\$597,000	\$882,000	\$1,517,000	
Metaline Falls	Sullivan Lake State	09S	1	\$34,000	\$47,000	\$81,000	
Monroe	First Air Field	W16	23	\$1,150,000	\$1,744,000	\$2,941,000	
Morton	Strom Field	39P	8	\$476,000	\$696,000	\$1,157,000	
Moses Lake	Grant County International	MWH	2,983	\$217,712,000	\$404,809,000	\$981,736,000	
Moses Lake	Moses Lake Municipal	W20	93	\$5,488,000	\$8,584,000	\$16,542,000	
Oak Harbor	A J Eisenberg	OKH	80	\$4,944,000	\$7,407,000	\$13,162,000	
Ocean Shores	Ocean Shores Municipal	W04	9	\$478,000	\$716,000	\$1,285,000	

*Note: Snohomish County (Paine Field) began scheduled commercial passenger service in 2019 after the 2018 study year of the Washington AEIA.



IMPACTS BY AIRPORT

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Associated City	Airport Name	FAA ID	Jobs	Labor Income (\$)	Value Added (\$)	Business Revenues (\$)
Odessa	Odessa Municipal	43D	12	\$677,000	\$997,000	\$1,788,000
Okanogan	Okanogan Legion	S35	4	\$100,000	\$147,000	\$266,000
Olympia	Olympia Regional	OLM	523	\$34,614,000	\$56,730,000	\$105,974,000
Olympia	Hoskins Field	44T	1	\$6,000	\$9,000	\$16,000
Omak	Omak Municipal	OMK	45	\$2,875,000	\$4,724,000	\$9,805,000
Oroville	Dorothy Scott Municipal	0S7	7	\$278,000	\$450,000	\$728,000
Othello	Othello Municipal	S70	17	\$790,000	\$1,040,000	\$1,576,000
Packwood	Packwood	55S	10	\$517,000	\$773,000	\$1,344,000
Point Roberts	Point Roberts Airpark	1RL	1	\$12,000	\$18,000	\$31,000
Port Angeles	William R Fairchild Inter- national	CLM	171	\$8,621,000	\$14,860,000	\$26,623,000
Port Angeles	Sekiu	11S	2	\$6,000	\$10,000	\$17,000
Port Townsend	Jefferson County Interna- tional	0S9	110	\$4,641,000	\$7,784,000	\$13,600,000
Poulsbo	Port of Poulsbo Marina SPB	83Q	0	\$0	\$0	\$0
Prosser	Prosser	S40	238	\$7,785,000	\$12,357,000	\$22,202,000
Puyallup	Pierce County-Thun Field	PLU	258	\$15,136,000	\$24,933,000	\$46,133,000
Quincy	Quincy Municipal	80T	1	\$23,000	\$38,000	\$63,000
Renton	Renton Municipal	RNT	35,470	\$2,946,356,000	\$6,134,458,000	\$13,641,026,000
Renton	Will Rogers Wiley Post SPB	W36	1	\$12,000	\$19,000	\$32,000
Republic	Ferry County	R49	3	\$176,000	\$265,000	\$485,000
Richland	Richland	RLD	682	\$44,083,000	\$65,619,000	\$114,192,000
Rimrock	Tieton State	4S6	1	\$18,000	\$25,000	\$43,000
Ritzville	Pru Field	33S	6	\$367,000	\$530,000	\$942,000
Roche Harbor	Roche Harbor SPB	W39	14	\$1,047,000	\$1,436,000	\$2,425,000
Rochester	R & K Skyranch	8W9	1	\$7,000	\$11,000	\$19,000
Rosalia	Rosalia Municipal	72S	8	\$469,000	\$694,000	\$1,227,000
Rosario	Rosario SPB	W49	162	\$11,979,000	\$16,381,000	\$27,670,000
Seattle	Kenmore Air Harbor	W55	318	\$14,143,000	\$21,996,000	\$36,291,000
Seattle	Seattle Seaplanes SPB	0W0	2	\$61,000	\$96,000	\$161,000
Sequim	Sequim Valley	W28	11	\$384,000	\$624,000	\$1,060,000
Shelton	Sanderson Field	SHN	1,013	\$61,628,000	\$135,395,000	\$288,484,000
Silverdale	Apex Airpark	8W5	5	\$437,000	\$757,000	\$1,543,000
Skykomish	Skykomish State	S88	1	\$59,000	\$81,000	\$136,000
Snohomish	Harvey Field	S43	567	\$24,098,000	\$44,635,000	\$78,401,000
South Bend	Willapa Harbor	2S9	1	\$37,000	\$54,000	\$88,000
Spokane	Felts Field	SFF	462	\$27,356,000	\$45,515,000	\$78,749,000

Associated City	Airport Name	FAA ID	Jobs	Labor Income (\$)	Value Added (\$)	Business Revenues (\$)
Stanwood	Camano Island Airfield	13W	15	\$1,052,000	\$1,464,000	\$2,425,000
Starbuck	Little Goose Lock and Dam State	16W	1	\$21,000	\$29,000	\$49,000
Stehekin	Stehekin State	659	1	\$25,000	\$33,000	\$53,000
Sunnyside	Sunnyside Municipal	1S5	38	\$1,981,000	\$3,007,000	\$5,211,000
Tacoma	Tacoma Narrows	TIW	684	\$39,387,000	\$73,593,000	\$160,333,000
Tekoa	Willard Field	73S	6	\$362,000	\$530,000	\$930,000
Toledo	South Lewis County (Ed Carlson Memorial Field)	TDO	38	\$2,356,000	\$3,841,000	\$6,641,000
Tonasket	Tonasket Municipal	W01	9	\$737,000	\$957,000	\$1,562,000
Twisp	Twisp Municipal	2S0	2	\$77,000	\$121,000	\$202,000
Vancouver	Pearson Field	VUO	290	\$13,639,000	\$23,241,000	\$39,940,000
Vancouver	Fly For Fun	W56	2	\$59,000	\$99,000	\$163,000
Vashon Island	Vashon Municipal	2S1	3	\$208,000	\$313,000	\$559,000
Walla Walla	Page	9W2	1	\$1,000	\$1,000	\$2,000
Warden	Warden	2S4	1	\$21,000	\$36,000	\$58,000
Waterville	Waterville	2S5	17	\$960,000	\$1,317,000	\$2,237,000
Westport	Westport	14S	11	\$681,000	\$975,000	\$1,729,000
Wilbur	Wilbur Municipal	258	32	\$1,577,000	\$2,029,000	\$3,005,000
Wilson Creek	Wilson Creek	5W1	5	\$348,000	\$482,000	\$834,000
Winthrop	Methow Valley State	S52	63	\$3,853,000	\$6,071,000	\$10,492,000
Woodland	Woodland State	W27	2	\$45,000	\$70,000	\$114,000
Subtotal EXCLUDING Seattle-Tacoma International (SEA)			255,642	\$19,701,418,000	\$39,227,398,000	\$84,562,170,000
Statewide Economic Impact of WA Airports			407,042	e \$26,800,918,000	Airport-level only*	\$107,040,070,000

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*The economic impacts of SEA were obtained from the 2018 "Sea-Tac International Airport Economic Impacts" study conducted by the Port of Seattle. This study did not calculate value added. As a result, value added cannot be reported at the statewide level.



IMPACTS BY AIRPORT

Boeing 767 waiting for completion at Snohomish County Airport (Paine Field)

Executive Summary

Total Statewide Economic Impacts

Based on an analysis of on-airport businesses, non-aviation tenants, offairport businesses serving airport visitors, the capital improvements on construction, and airport-reliant businesses, the Washington aviation system provided an overall net contribution to the state's economy of \$107.0 billion in business revenues and 407,042 jobs, generating \$26.8 billion in labor income for Washington residents.

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On-Airport Activity

On-airport activities result in a direct economic impact of \$61.1 billion in business revenues and support a 98,141 jobs that generate \$11.8 billion in payroll. Combined with supplier purchases and worker income re-spending, on-airport activity in Washington provides a total economic impact of \$93.15 billion in business revenues, 285,656 jobs, and \$21.93 billion in labor income.

Visitor Spending

The estimated 10.4 million visitors arriving via Washington's 134 public airports spent \$6.97 billion across a variety of industries, supporting 78,132 jobs and generating \$2.6 billion in labor income. Combined with supplier purchases and the re-spending of worker income, off-airport visitor spending generates a total economic impact of \$13.89 billion in business revenues, 121,384 jobs, and \$4.87 billion in labor income.



Key Aviation Activities

In addition to calculating the total economic impact of each public-use airport, the Washington AEIS also closely evaluated the specific on-airport impacts of six key aviation activities. These activities have significant impacts on airport facilty needs and serve the economic needs of the state. Additional in-depth analyses of the economic impacts of agriculture-related aviation activity and air cargo occurring both on- and off-airport were also conducted.



STATEWIDE TAX IMPACTS

Airports' direct economic impacts also result in local, state, and federal tax revenues. On-airport businesses pay business and operating (B&O) taxes. Visitor spending generates taxes and fees associated with sales, hotel, and rental car taxes.

Aircraft fuel and excise taxes contributed an additional \$3.17 million to the state (2018)—money, in part, used to fund ongoing investments back into the state aviation system.





Executive Summary

Emerging Technologies

Washington's airports are increasingly looking to support some of the most innovative companies in the aviation industry today in fields including electric aircraft, unmanned aerial systems (UAS), urban air mobility (UAM), and alternative aviation fuels. The impacts of these technologies will be far-reaching with the potential to not only change how people and goods move between global destinations, but entirely shift the role of air transportation in our daily lives while reducing carbon and greenhouse gas emissions. The Washington AEIS conducted a series of analyses to understand how these technologies may affect the state's airport system—offering WSDOT Aviation the opportunity to work in partnership with airports to both prepare for and maximize the opportunities associated with the aviation ecosystem of the future.

In 2010, the U.S. announced an ambitious goal of carbonneutral growth for domestic commercial aviation by 2020 using 2005 emissions as a baseline. Today, the FAA continues to advocate for emissions reductions by providing tools and resources for both the GA and commercial service sectors. Several sustainable aviation fuels (SAFs) for turbine-powered jet aircraft are already available, although high production costs have limited their widespread adoption in the marketplace. Despite significant investments, researchers are still working to identify a lead-free alternative to the 100 Low Lead (or AvGas) utilized by much of the piston-powered GA fleet.

UAS

First developed for military use, UAS have proliferated over the last decade and are now widely deployed in a variety of recreational, commercial, and governmental applications. The domestic UAS market grew from \$40 million in 2012 to approximately \$1 billion by 2017. By 2026, commercial applications are anticipated to add between \$31 to \$46 billion to the U.S. Gross Domestic Product. Wing—a subsidiary of Google's parent company Alphabet—began the first UAS deliveries in the country in October 2019 after receiving air carrier certification from the FAA earlier that same year. While the potential benefits of UAS are many, regulators, airports, and industry stakeholders continue to work together to ensure their safe integration into the National Airspace System (NAS).



Alternative Aviation Fuels UAM

UAM may one day aid in reducing road congestion in urban areas with the use of on-demand and highly automated (unmanned) aircraft/vehicles with vertical take-off and landing (VTOL) capabilities and the potential to carry thousands of pounds of cargo or passengers. UAM vehicles could enter commercial markets by 2030, although significant investments are still required. In addition to relieving congestion, this technology may enhance connectivity between rural/suburban areas and the urban core--opening new economic, educational, and other opportunities to residents across the state.

Electric Aircraft ------

Electric aircraft represent the cutting-edge of aviation technology, driven by the world's growing concern for carbon emissions related to air travel, new advancement in battery capacity, and the rising and volatile cost of petroleum-based fuels. Electric aircraft are significantly less expensive to operate and maintain and quieter, resulting in less impact on noise sensitive populations and associated land uses. Already in use for pilot training, electric aircraft could soon provide short-haul commercial service. Washington's airports may witness a significant uptick in demand for all types of aviation including scheduled commercial service, GA, and air cargo.

Electric Aircraft Working Group (EAWG) ------

WSDOT Aviation convened the EAWG in 2018 to explore the feasibility of introducing electric aircraft in Washington state focusing on expanding regional air service. Building upon the work of the EAWG, the ongoing Electric Aircraft Feasibility Study will provide a detailed assessment of the potential impacts of electric aircraft in terms of infrastructure needs, workforce development, economic impact, and regional passenger service. The study is anticipated for completion in late 2020.

Potential Types of Impacts	Electric Aircraft	UAS	UAM	Alternative Aviation Fuels
F	inancial (On- and O	ff-Airport)	·	
Stability of fuel costs	•	•	•	•
Lower cost of fuel	•	•	•	
Reduced maintenance costs	•			
Demand for commercial service	•			•
Demand for general aviation	•		•	
Demand for air cargo	•	•		•
	Environment	al		
Reduced carbon/greenhouse gas emissions	•	•	•	•
Electronic waste concerns	•	•	•	•
Battery manufacturing and disposal	•	•	•	
Human health and air quality benefits	•	•	•	•
	Infrastructure N	eeds		
Airside				•
Landside	•			
Off-airport		•	•	
	Staff and Workf	orce		
Pilot training opportunities	•			
Existing workforce displacement		•	•	
Workforce development opportunities	•	•	•	•
	Mobility and Ac	cess		
Urban/rural connectivity	•	•	•	
Airport access			•	
Reduced urban congestion		•	•	
	Safety			
Shared airspace concerns		•	•	
Emergency response and law enforcement		•	•	





Wisk Aero, a joint venture between The Boeing Company and Kitty Hawk Corporation, is currently testing "Cora," a two-seat, eVTOL air taxi for commercial deployment.

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Harbour Air, a regional carrier based out of Vancouver, British Columbia, is retrofitting its existing floatplane fleet to all-electric in partnership with Washington-based MagniX.



Alaska Airlines recently announced plans to power all flights out of Sea-Tac with sustainable aviation biofuel in an innovative partnership with Boeing and the Port of Seattle.

Statewide Aviation Investment

Creating an on-airport environment where businesses can thrive enhances an airport's role as an economic engine for its community.

Economic Performance Measures

An airport's potential to maximize its economic impact depends, in part, on its ability to support business needs and cultivate an environment of economic prosperity. This ability is influenced by the facilities and services available at the airport, the formal policies that govern its management and organization, and the implementation of various strategies and initiatives that enhance an airport's attractiveness to potential businesses.

Building upon the Economic Development and Prosperity goal of the 2017 Washington Aviation System Plan, the Washington AEIS developed a series of

recommendations to help enhance the economic vitality of our airports, communities, and the state.

Recommendations include informational Performance Indicators (PIs) for WSDOT Aviation and Metrics for airports. The AEIS further recommends implementing the actionable Performance Measures (PMs) identified during the WASP. These PMs, PIs, and Metrics work together to foster a vibrant and diverse aviation- and aerospace-related economy in Washington.

Washington Aviation System Plan

- Airports with documented air cargo activity (by type) and strategy/market and airports with growing (>1%per year) commercial airline service
- Airports with active development partnerships with chambers of commerce, tourism bureaus, service organizations, industries, governments, and recreational user groups
- Airports with business parks or landside real estate development (existing and available) and those with on-site aerospace manufacturing lessees
- Airport classification-specific recommended minimums and targets associated with tracking, reporting, and enhancing air cargo/freight activity
- Collaborate with state & local agencies to document economic and qualitative contributions of aviation
- Collaboration with businesses to support airport activities

Washington Aviation Economic Impact Study

- Numbers of airports that report air cargo activity
- Volume of UAS cargo deliveries within Washington by weight and operations
- Impacts of annual FAA, WSDOT, and local capital expenditures on airport projects (total dollars spent)
- Value of enplaned and deplaned air cargo by tonnage and estimated commodity costs

Investment Needs in Washington

The 2015 Airport Investment Study reported that public-use airports will need approximately \$3.6 billion in preservation and capital project funds through 2034. WSDOT's share of the overall program needs is \$240 million. Based on funding forecasts, WSDOT's Airport Aid Grant Program will be able to contribute \$1.4 million annually over the next 20 years, resulting in an average annual shortfall of more than \$12 million.

This shortfall further underlines the critical need for WSDOT Aviation and airports to take a proactive role in implementing revenue-producing strategies on airport property, pursuing innovative partnerships with the private sector, and refining existing state funding structures to maximize resources available to airports. Additional information about the Aviation Investment Study is available online at wsdot.wa.gov/aviation/Planning/ AirportInvestmentStudy.htm.

Between 2016 and 2018, WSDOT Aviation awarded an average of \$1.47 million in Airport Aid Grants each year. The Washington AEIS shows that the airport system results in a total economic impact in the state of \$107.0 billion and over 400,000 jobs for Washington's residents—demonstrating that investing in aviation pays profound dividends to our state.

Tools for Economic Vitality

The Washington AEIS is a valuable mechanism to communicate the value of our airports to policymakers and communities, both in terms of contributions to local and statewide economies as well as the many quality of life benefits for residents. To support airports' abilities to increase their total economic impacts, WSDOT Aviation has developed several online tools as part of the Washington AEIS.

Aviation Economic Calculator

Over time, key drivers of an airport's economic impact can shift. The updated Aviation Economic Calculator allows airports to quantify how changes affecting on-airport activity and visitor spending may increase or decrease the total economic impact. Increased capital expenditures, current operational data, new information about on-airport business activity, and other data variables can be input into the calculator. The tool then updates the airport's economic impacts --offering objective insight into the impact of a proposed airport initiative.

Washington Aviation GeoPortal

Certain types of off-airport businesses generally rely on airports to conduct business operations. Agricultural processors ship perishable goods, fabricators send widgets for just-in-time manufacturing processes, and hospitals transport patients and staff for routine and emergency medical services. The Washington AEIS identified businesses across the state that may benefit from aviation. This information is available to airports via the Washington Aviation GeoPortal. Airports can view and download information on potentially air-reliant businesses within their vicinities--offering new opportunities to cultivate partnerships with industries that depend on aviation.

THE WASHINGTON AVIATION ECONOMIC CALCULATOR AND WASHINGTON AVIATION GEOPORTAL ARE BOTH AVAILABLE VIA THE WSDOT AVIATION HOMEPAGE AT WSDOT.WA.GOV/AVIATION.

July 2020



Community Aviation Revitalization Loan Program

Founded in the recommendations of the Airport Investment Study, WSDOT Aviation announced the creation of the Community Aviation Revitalization Loan Program in fall 2019. Designed to help airports become more self-sufficient, the revolving loan fund provides low-interest loans for airports to complete revenue-producing projects such as hangars, aircraft refueling stations, and other facilities. Additional information and loan applications are available online at wsdot. wa.gov/aviation/funding/CARB-Loan.htm.



Robert Hodgman AEIS Project Manager/Senior Aviation Planner 360-596-8910 hodgmar@wsdot.wa.gov

Christina Crea Aviation Communications Consultant 360-709-8098 creac@wsdot.wa.gov

Americans with Disabilities Act (ADA) Information: Individuals requiring reasonable accommodations may request written materials in alternate formats, sign language interpreters, physical accessibility accommodations, or other reasonable accommodations by contacting Christina Crea at 360-709-8098. Persons who are deaf or hard of hearing may contact Christina Crea at WSDOT Aviation through the Washington Relay Service at 7-1-1.

Title VI Statement to Public: It is the Washington State Department of Transportation's (WSDOT) policy to assure that no person shall, on the grounds of race, color, national origin and sex, as provided by Title VI of the Civil Rights Act of 1964, be excluded from participation in, be denied the benefits of, or be otherwise discriminated against under any of its federally funded programs and activities. Any person who believes his/her Title VI protection has been violated may file a complaint with WSDOT's Office of Equal Opportunity (OEO). For Title VI complaint forms and advice, please contact OEO's Title VI Coordinator at 360-705-7098.