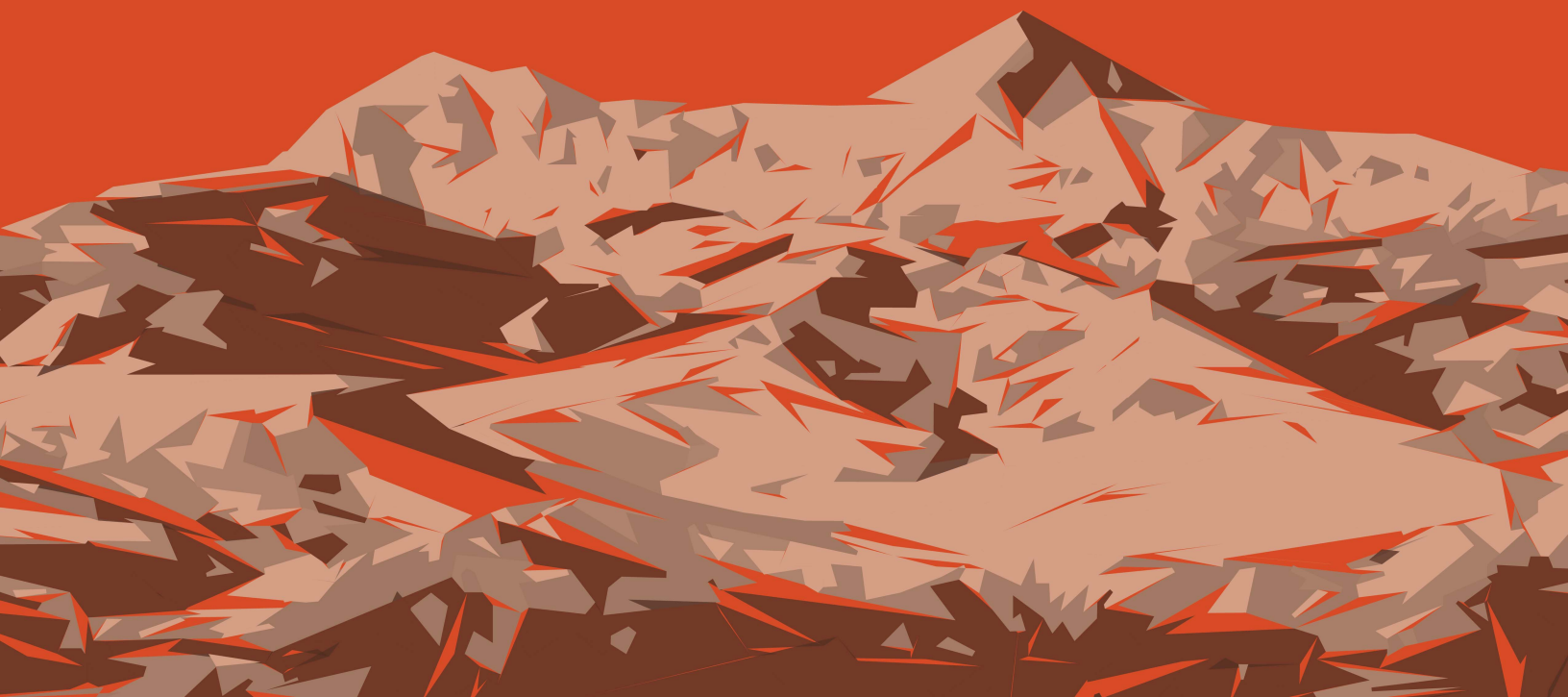
2016

WYOMING AIR SERVICE

Enhancement Program
Return on Investment Analysis

WYDOT AERONAUTICS



Heart Mountain *(cover)*
Elevation: 8,123’
Location: Northwest Wyoming *(Park County)*

Heart Mountain, located in the Big Horn Basin, is known for its odd and intriguing shape. It is commonly believed that the Crow Nation so named Heart Mountain due to its resemblance to a bison heart. The mountain itself, composed of limestone and dolemite 500 to 350 million years old, rests upon the Willwood Formation, which is only 55 million years old. This odd phenomenon has been studied by geologists for well over a century.

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Wyoming Air Service Enhancement Program Return on Investment Analysis

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Executive Summary

An economic impact study was completed as part of the 2016 Wyoming State Aviation System Plan (WYSASP) Update that estimated the economic benefit for each flight subsidized through Wyoming Department of Transportation's (WYDOT) Air Service Enhancement Program (ASEP) from 2004-2015. Laramie's service under the Essential Air Service program along with Sheridan's participation in the ASEP in 2016 was completed as an add-on to this analysis.

The **direct impact** of each ASEP-supported flight was analyzed based on two categories: 1) off-airport visitor spending, and 2) on-airport related activities, such as businesses and organizations engaged in day-to-day airport operations and projects.

In addition to measuring the direct impacts of each flight, estimates of the re-circulation and re-spending of direct impacts within the economy, known as **multiplier effects**, were also made. Multiplier effects include **indirect impacts** (that occur when businesses spend their revenue on business expenses such as payroll or equipment) and **induced impacts** (that occur when employees spend their earnings on goods and services in the local economy).

The analysis found that the Wyoming ASEP program has had a strong positive impact on the economies of regions surrounding participating airports since 2004.

The $21 million invested in the 60 ASEP grant programs evaluated over this 12-year period have:

1. Produced over 307,000 incremental[1] visitors to the state with a total incremental visitor spending of over $370 million;
2. Supported over 6,300 jobs on and off airport with a total payroll of over $237 million;
3. Driven incremental state tax revenues of over $30.8 million ($9 million more than the state invested in the ASEP); and
4. Produced a total economic impact of over $523 million for an average return of $24 of economic benefit for every $1 invested.

Airport	ASEP Investment	Total Economic Output	ROI
Cody	$2,297,924	$66,638,324	28.00
Casper	$1,953,520	$16,136,400	7.26
Cheyenne	$2,250,000	$7,839,204	2.48
Gillette	$6,651,105	$29,973,759	3.51
Jackson	$1,452,393	$376,195,556	258.02
Riverton	$128,934	$3,078,553	22.88
Rock Springs	$6,816,726	$23,421,443	2.44
All Airports	**$21,550,602**	**$523,283,240**	**23.28**

[1] In addition to or above what would otherwise have been without the service.

BACKGROUND

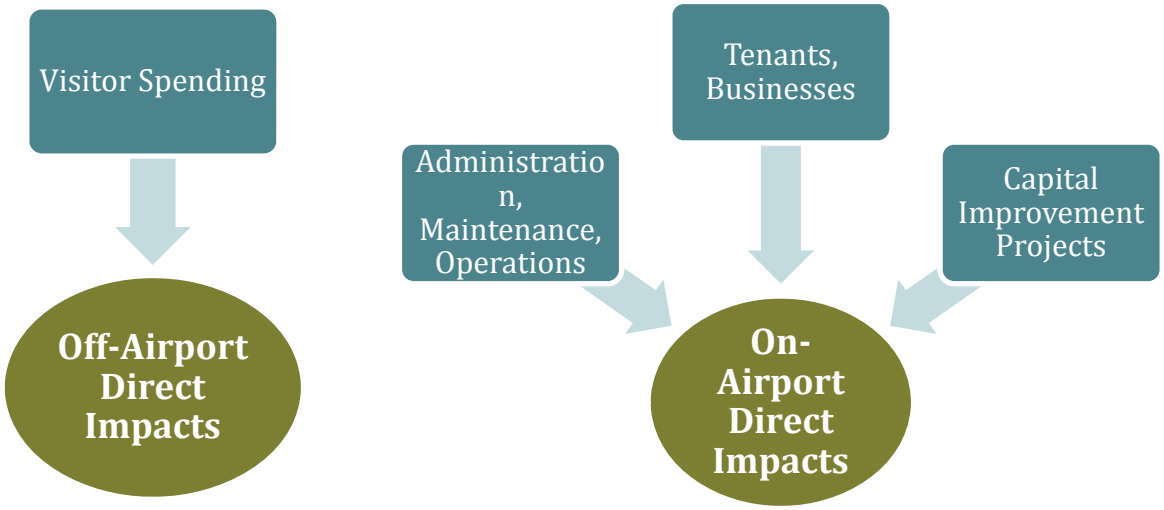
The Wyoming Legislature created the ASEP in 2004 to combat limited air service with high airfares and to generate economic growth. At the time, Wyoming had the 5th highest airfares in the country, which led many Wyoming residents to drive to airports outside of the state to find reduced fares, better schedules, increased reliability, and greater air service choices. Between 2004 and 2015, the ASEP, administered by the WYDOT Aeronautics Division's Air Service Development Program, has supported approximately 60 routes at a cost of more than $21 million. This program has positioned Wyoming at the national forefront in enhancing air service on a state-wide basis.

Mead & Hunt worked with Keystone Aviation Consulting, LLC to conduct an economic impact analysis that estimated the employment, payroll, and output associated with each flight subsidized by the ASEP from 2004-2015. Using the IMPLAN model (IMpacts for PLANning –industry standard software for economic analysis) and inputs such as visitor spending from the 2013 Wyoming Airports Economic Impact Study, a methodology was developed to assess the return on investment of the ASEP. Though it is complicated to accurately estimate the true net incremental[2] jobs and visitor spending as a result of an individual flight, by using detailed airport and flight-specific impacts, employment numbers, local visitor spending and economic activity, this analysis represents a credible methodology to allocate impacts across individual routes. The methodology for this approach is outlined below along with highlighted results of the analysis.

Methodology

To measure the economic impact of each subsidized route, two categories of **direct impacts** were estimated as illustrated in **Figure 1**: off-airport visitor spending and on-airport related activities.

Figure 1: Direct Impacts of Individual Flights



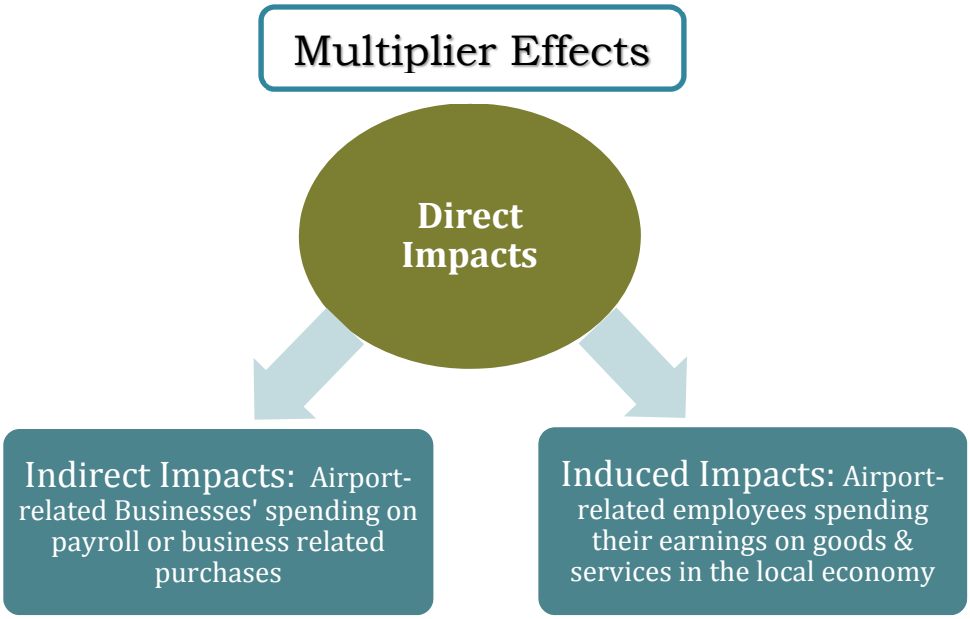
[2] In addition to or above what would otherwise have been without the service.

Within each of these areas, estimates for employment, payroll, and economic output directly attributable to each flight as defined below were made:

- **Employment-** the number of employees who have jobs related to commercial air service, and more specifically, each flight. These are expressed as full-time equivalents with two part-time jobs equal to one full-time job.
- **Payroll-** the annual wages, salaries, and benefits associated with the jobs supported by the flight.
- **Economic output-** the economic activity generated by the flight. Economic output includes spending of businesses such as airlines, ground-handling services, retail and food vendors, airport management, operations staff, and government organizations. Capital expenditures of these businesses and government organizations are included. Visitor purchases in the surrounding community are included as off-airport direct spending. Visitor purchases made at the airport are included as on-airport economic output.

In addition to measuring the direct impacts of each flight, estimates were made for the impact of spending, or re-circulation and re-spending of direct impacts within the economy. These waves of economic activity are known as **multiplier effects.** There are two types of multiplier effects:

- **Indirect impacts** occur when businesses spend their revenue on business expenses such as payroll or equipment. For example, if an air carrier purchases fuel from a local distributor (the direct output) and the distributor purchases new equipment such as hoses, that additional purchase is an indirect impact. Additionally, if a local hotel (where visitors from a flight stay in the region) purchases food and drink for its restaurant, those expenses are indirect economic output.
- **Induced impacts** occur when employees spend their earnings on goods and services in the local economy. For example, if an air carrier employee spends a portion of his/her wages on retail, restaurants, or professional services, those are included as induced impacts.



Both indirect and induced impacts are calculated using the IMPLAN model for each Wyoming county in which the airport of the route is located. IMPLAN is an input-output model that accounts for all dollar flows across different sectors of the economy of a region. Using this information, IMPLAN models the way a dollar spent in one sector (via output or payroll) impacts the economy through the **multipliers** referenced above**.** IMPLAN generates different multipliers that capture both indirect and induced impacts for employment, payroll, and output. The size of these multipliers varies across each category and depends on four main factors:

- The overall size and economic diversity of the region's economy;
- The geographic extent of the region and its role within the broader region;
- The nature of the economic sectors being considered; and
- National economic trends during the year of study.

IMPLAN-generated multipliers are presented as a ratio:

$$Multiplier = \frac{Direct + Indirect + Induced}{Direct}$$

Therefore, a multiplier of 1.5 would represent a total of indirect and induced impacts that are 50 percent of the total direct impact.

Off-Airport Economic Impact

Off-airport economic impacts relate to the spending by visitors who arrive at a destination on a commercial flight. Once these visitors arrive at a destination, they spend money for lodging, ground transportation, food, recreation, retail, and entertainment. To calculate visitor spending or output, the first step was to identify the percentage of enplanements that are not from the local area. The data on the percentage of visitors for each market came from passenger surveys from Wyoming airports included as part of the 2013 Wyoming Airports Economic Impact Study. Next, the total number of visitors for each route was multiplied by the average amount each passenger spends per visit. This amount also came from passenger surveys at each Wyoming airport and was adjusted for inflation to ensure the use of constant dollars. To calculate total visitor spending for a route:

Total Enplanements **X** Percentage of Visitors **X** Average Amount Per Trip = Total Visitor Spending

For example, Route #1 from ABC-DEF has 10,000 enplanements from January 2013 to December 2013. ABC's market averages 55 percent of visitors to the region. The average passenger in ABC spends $500.00 per trip. As a result:

10,000 **X** (.55) **X** ($500.00) = $2,750,000

Then, IMPLAN is used to determine the number of jobs and payroll supported by the amount of visitor spending for each flight. As is the case with on-airport economic impacts, the visitor spending-related jobs and payroll generate both indirect and induced impacts. Multiplier effects at the county level for each airport and route were estimated. County models estimate each airport's economic impact on its local market area.

On-Airport Economic Impact

To determine the on-airport economic impact, estimates for the percentage of total airport employment, payroll, and output attributable to each flight were calculated. This figure is estimated by multiplying the total employment, payroll, and output attributed to all commercial service at an airport by a ratio of the enplanements for the subsidized route over the total enplanements at the airport over the same time period. To estimate the impact of the ABC-DEF route on each factor at airport ABC, the following formulas were used:

Total Employment **X** (ABC-DEF Enplanements/Total ABC Enplanements) = ABC-DEF Related Employment

Total Payroll **X** (ABC-DEF Enplanements/Total ABC Enplanements) = ABC-DEF Related Payroll

Total Output **X** (ABC-DEF Enplanements/Total ABC Enplanements) = ABC-DEF Related Output

For example, Route #1 from ABC-DEF has 10,000 enplanements from January 2013 to December 2013. Airport ABC has 100,000 enplanements total from January 2013 to December 2013. All commercial service at airport ABC has the following economic impacts:

Total Employment	**25**
Total Payroll	**$1,000,000**
Total Economic Output	**$2,000,000**

As a result, the calculations below show the following estimated impacts:

25 **X** (10,000/100,000) = 2.5 related jobs

$1,000,000 **X** (10,000/100,000) = $100,000 related payroll

$2,000,000 **X** (10,000/100,000) = $200,000 related output

Then, an adjustment was made for the ratio of total enplanements in the year of the revenue guarantee compared to 2013, the year of the Wyoming Airports Economic Impact Study from which the employment, payroll, and output figures are derived. Therefore, for the related output figure above, if enplanements at airport ABC were 90,000 in the year of the revenue guarantee, the calculation would be:

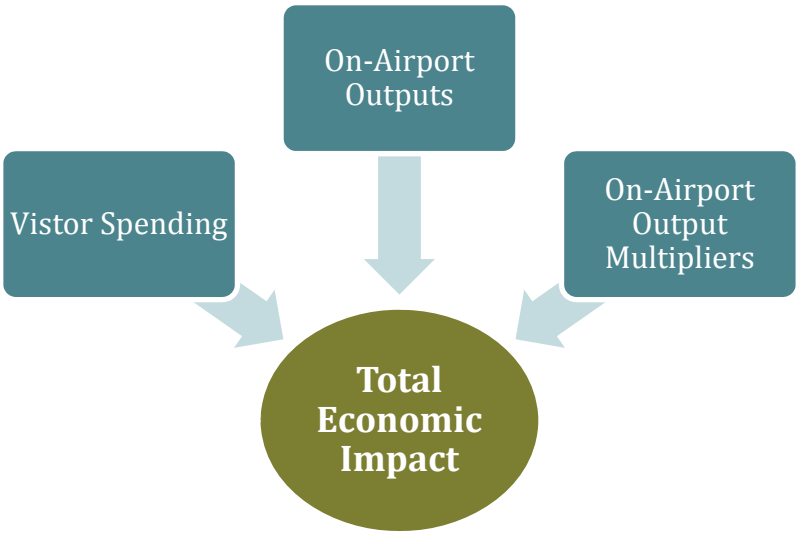
$200,000 **X** (90,000/100,000) = $180,000

Additionally, adjusting the related payroll and output figures for inflation ensures the analysis is using constant dollars for both the impacts and the revenue guarantees provided by ASEP. Completion of the calculations for the related initial employment, payroll, and output then leads to estimates of the appropriate multiplier effects for each category of impact. As was the case for off-airport economic impact, the estimates of multiplier effects use an IMPLAN model at the county level for each airport and route. County models estimate each airport's economic impact on its local market area.

Total Economic Impacts

To calculate the total economic impacts, the direct off-airport visitor-related spending (output) was combined with the direct and multiplier effects for on-airport impacts (output). Total Impact = Visitor Spending + On-Airport Output + On-Airport Output Multipliers, as illustrated in **Figure 2**.

Figure 2: Composition of Economic Impacts for Individual Flights



Return on Investment Analysis

The following formula was used to calculate the return on investment (ROI) for each route subsidized through the ASEP:

$$ROI = \frac{Economic\ Impact\ From\ Investment - Initial\ Investment}{Initial\ Investment}$$

ROI is presented as a ratio, with 0 indicating a break-even scenario and 1 equaling a doubling of the initial investment amount. To make things easier to interpret, calculations include the payroll and output impact per $1 of revenue guarantee for each route.

State Tax Revenue

The inputs used in the IMPLAN model to calculate the state tax revenue for each flight are the visitor spending, on-airport output, and payroll data for each flight. The IMPLAN model generated estimates of tax revenues using 2015 state tax rates and taxing structures. The model measured the direct sales tax revenue generated through each flight as well as the taxing effect of the recycling of dollars throughout the economy.

Results of Analysis

Summary of ASEP Revenue Guarantees

Between 2004 and 2015, the ASEP supported a total of 60 routes with a total investment of $21,550,602. **Figure 3** illustrates the number and percentage of revenue guarantees paid out by the state to commercial service airports in Wyoming. Of the 60 routes subsidized, 19, or 32 percent, were from Jackson (JAC), 16, or 27 percent, from Cody (COD), and 10 each (17 percent) from Rock Springs (RKS) and Gillette (GCC). **Figure 4** illustrates the distribution of Wyoming ASEP revenue guarantee dollars by airport from 2004 to 2015. RKS flights have received more than $6.8 million (32 percent of the total) in revenue guarantees, while GCC flights received $6.6 million (31 percent). While flights at JAC received 32 percent of the total number of revenue guarantees, they represented only seven percent of the total revenue guarantee dollars.

Figure 3: Number of ASEP Subsidized Routes by Airport

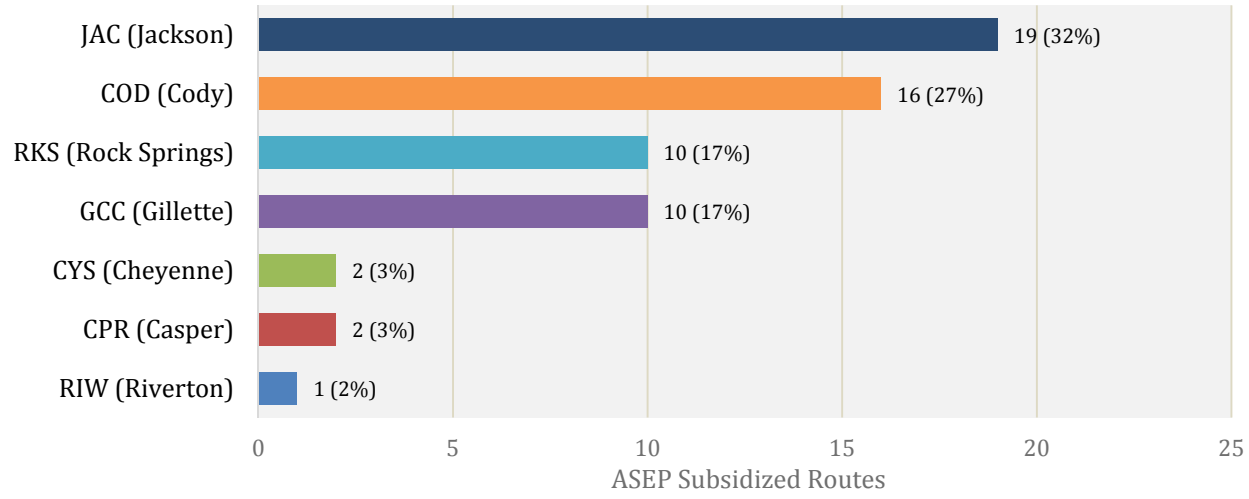
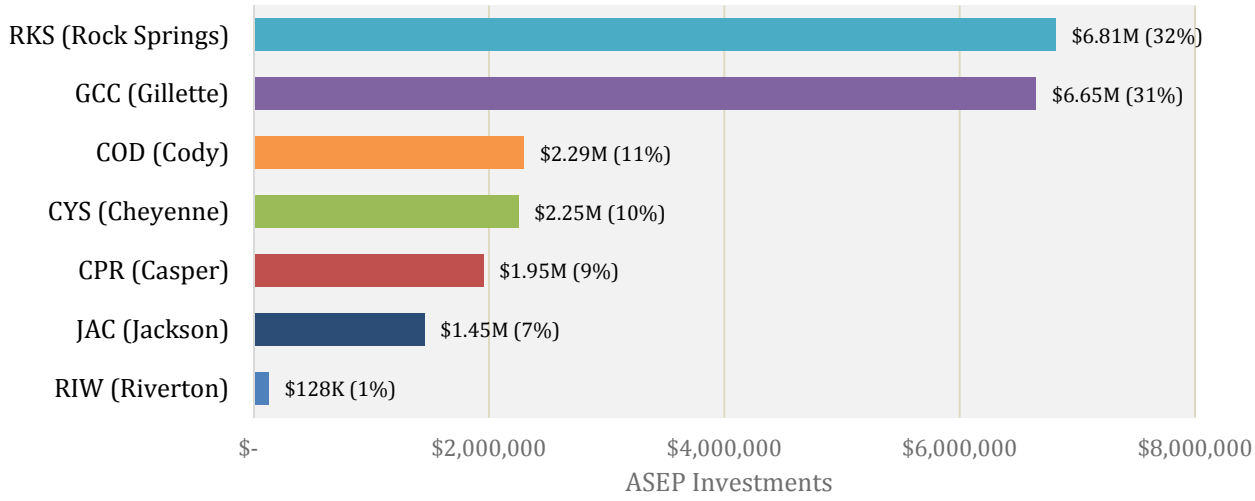
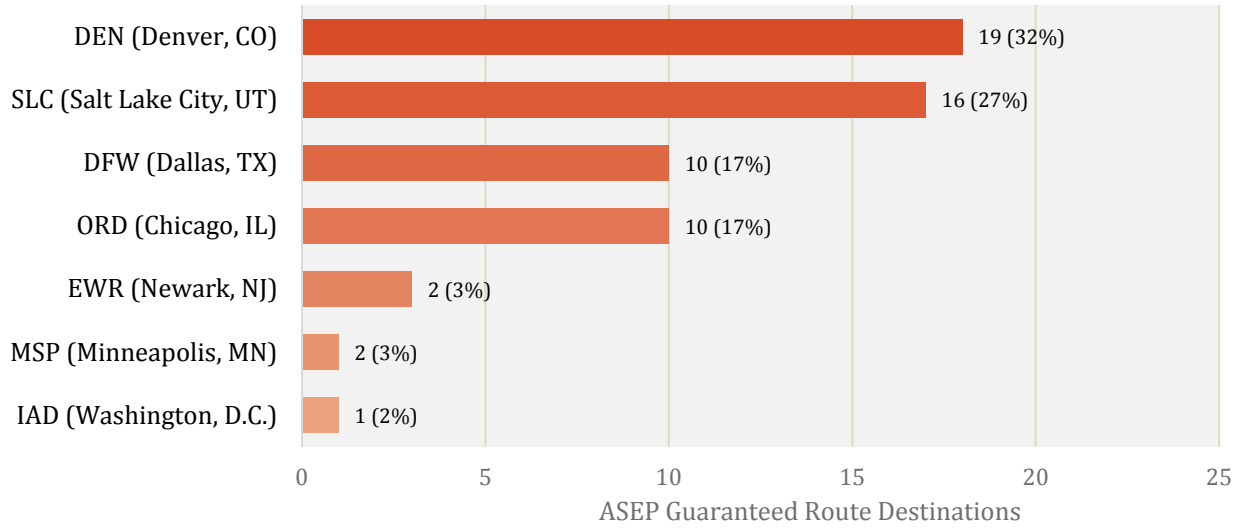


Figure 4: Total ASEP Revenue Guarantee Investments by Airport



One of the major goals of the ASEP was to improve the connectivity and number of non-stop destinations available to residents of Wyoming and visitors traveling to the state. **Figure 5** illustrates the number of ASEP subsidized flights by destination during the study period. As expected, many of these flights were regional jet flights to legacy carrier hubs including Denver (DEN) (United Airlines), Salt Lake City (SLC) (Delta Air Lines), Chicago (ORD) (American Airlines and United Airlines), and Dallas (DFW) (American Airlines). Thirty-two percent of the routes subsidized by ASEP were to DEN while another 27 percent were to SLC.

Figure 5: Number of ASEP Subsidized Routes by Destination



Statewide Economic Impact

This section presents the statewide economic impact for all flights subsidized through the ASEP from 2004 to 2015.[3] The results presented below are based on the 60 routes provided by WYDOT at the time of the analysis. **Table 1** illustrates that the routes subsidized by the ASEP resulted in a total of 464,700 enplanements that supported 6,365 jobs and resulted in a total economic impact of more than $523 million, and generated more than $30.8 million in state tax revenue.

Table 1: ASEP Economic Impacts and Tax Revenue

Number of Routes Subsidized	Total Amount of Revenue Guarantees	Total Enplanements	Total Jobs Supported	Total Economic Impact	State Tax Revenue
60	$21,550,602	464,700	6,365	$523,283,240	$30,800,170

[3] For consistency, the analysts included all ASEP projects including ASJAC01, ASE09, and ASCOD03. These projects had no investment from the ASEP due to the profitability of the routes. While the ROI for these routes is effectively zero (because no investment was actually made), the benefits from each route were included in the total calculation.

Table 2 illustrates the composition of the total economic impact of $523 million. A detailed breakdown of these impacts by ASEP Project, year and market supported is shown in the appendix in **Table 9**. The total on-airport output that can be attributed to the 60 ASEP flights was approximately $101 million, which generated a total of roughly $51 million in indirect and induced multiplier effects. In addition, the ASEP flights brought more than 307,000 visitors to the state of Wyoming, resulting in visitor spending of $370 million. **On-airport output, on-airport multiplier effects, and total visitor spending yielded a total economic impact of $523,283,240 for the 60 routes subsidized by the ASEP.**

Table 2: Composition of Statewide Total Economic Impact

Total On-Airport Output	On-Airport Multiplier Effects	Total Visitor Spending	Total Economic Impact
$101,755,978	$51,131,186	$370,396,076	$523,283,240

Table 3 presents the statewide ROI analysis of all flights subsidized by the ASEP. Using the total revenue guarantee amount of $21,550,602 for the 60 flights analyzed and the total economic impact of $523,283,240 produces a return of $24.28 for each dollar invested by the state and an overall ROI of 23.28. **For every dollar the State of Wyoming invested in subsidizing air service through the ASEP, $24.28 was generated in local economic output.**

Table 3: ROI Analysis-Total Economic Impact

Total Revenue Guarantees	Total Economic Impact	Impact Per Dollar of Revenue Guarantee	Statewide Total ROI
$21,550,602	$523,283,240	$24.28	23.28

A more conservative approach examined the ROI from only direct visitor spending and the total tax revenue generated by the subsidized flights. As **Table 4** illustrates, $17.19 (ROI 16.19) of visitor spending and $1.43 (ROI 0.43 of state tax revenue are generated for each ASEP dollar invested in air service. Tax revenue calculations include state and local specific sales and excise taxes from airport-related purchases of goods and services. **Substantively, this means Wyoming generated additional tax revenues for the state by investing in the ASEP.**

Table 4: ROI Analysis-Visitor Spending and Tax Revenue

Total Revenue Guarantees	Total Visitor Spending	Total Tax Revenue	Visitor Spending Per Dollar of Revenue Guarantee	Tax Revenue Per Dollar of Revenue Guarantee
$21,550,602	$370,396,076	$30,800,176	$17.19 (16.19 ROI)	$1.43 (0.43 ROI)

Table 5 breaks down Total Visitor Spending and Visitor Spending ROI by airport. At every airport, Visitor Spending Return per dollar invested in ASEP is positive. Returns range from $1.83 in visitor spending per one dollar of ASEP investment at Rock Springs to as high as $203 return per dollar invested at Jackson.

Table 5: Visitor Spending ROI by Airport

Airport	ASEP Investment	Total Visitor Spending	Visitor Spending Return Per Dollar of Revenue Guarantee	Visitor Spending ROI
Cody	$2,297,924	$31,929,905	$13.90	12.90
Casper	$1,953,520	$5,365,148	$2.75	1.75
Cheyenne	$2,250,000	$5,463,998	$2.43	1.43
Gillette	$6,651,105	$18,484,859	$2.78	1.78
Jackson	$1,452,393	$295,903,163	$203.73	202.73
Riverton	$128,934	$804,875	$6.24	5.24
Rock Springs	$6,816,726	$12,444,127	$1.83	0.83
All Airports	**$21,550,602**	**$370,396,076**	**$17.19**	**16.19**

Based on these returns, even if it was assumed, for sensitivity purposes, that half of the visitors associated with the ASEP flights would have still found their way to their intended destinations regardless of whether the ASEP flight was in place or not, the program would still have produced over an 8 to 1 return.

Performance by Airport

In the Appendix on pages 16 through 21, we show performance broken down by Wyoming airport. **Figure 6** shows average enplanements per ASEP flight with the average grant generating anywhere from 3,770 passenger enplanements (Riverton) to more than 10,700 enplanements in Casper. **Figure 7** shows the average ASEP revenue guarantee per enplanement generated with the most efficient programs at Jackson (an average of $0.74 per enplanement) to a high of $137 per enplanement at Rock Springs. The other five airports average between $24 per enplanement (Cody) to $114 per enplanement (Cheyenne).

Figures 8 and 9 show average economic impact and average visitor spending by airport. Economic impact ranges from just over $2.3 million in Rock Springs to over $19 million per flight in Jackson. Visitor spending at five of the six airports ranged from $800,000 up to $2.7 million while Jackson with its high-end tourism and ski market related spending driving its average visitor spending to more than $15 million.

Figure 10 shows average jobs supported per flight with employment ranging from 13 jobs at Cheyenne to more than 200 jobs at Jackson.

Figure 11 shows state tax revenue generated per flight with three of the seven airports generating more tax revenues than the cost of the average revenue guarantee for that airport.

The next two charts, **Figures 12 and 13**, plot average return per dollar of investment and average ROI by airport. **Every airport showed positive returns on investment with Jackson showing the highest returns and Rock Springs showing the lowest average returns.**

Comparison to Unsubsidized Flight Performance

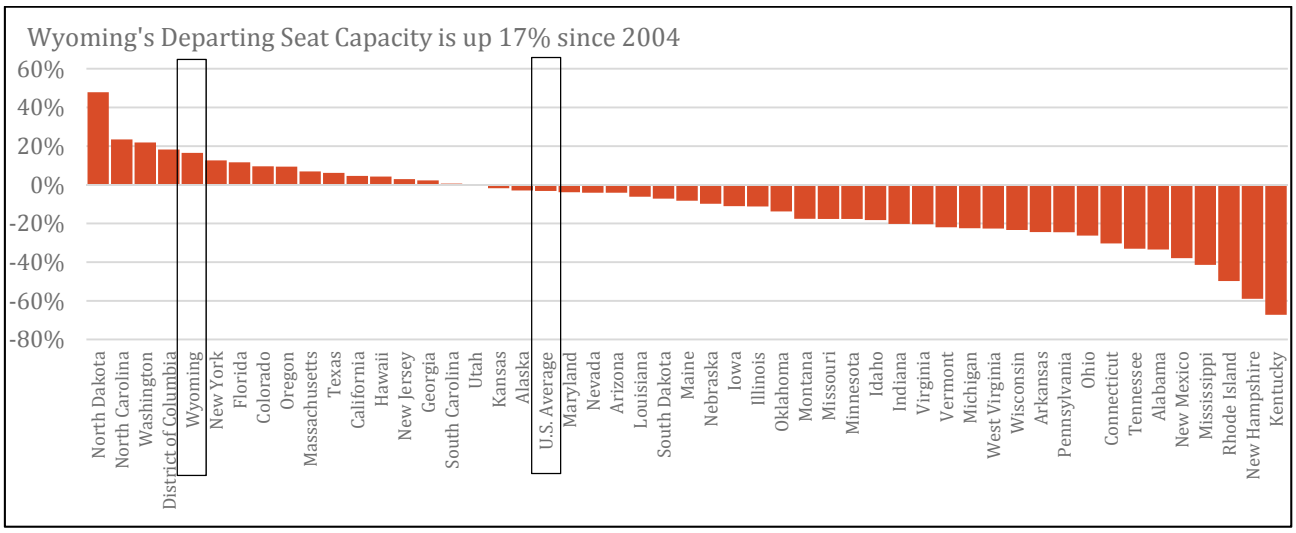
While it is difficult to compare performance of airports in different years and different circumstances, a high-level review of airport performance using passengers per day as the relevant metric shows that during the years that Wyoming airports participated in ASEP programs, they produced an average of 25 percent more passengers per day (and by corollary, likely 25 percent stronger economic impact) than these same airports did during years in which they did not participate in ASEP programs. **Table 6** below shows the average passengers per day generated by airport during subsidized years compared to the average passengers per day generated during unsubsidized years. **Figure 14** in the appendix shows this same comparison on a percentage basis. If we limit the comparison to the four airports (Cody, Gillette, Jackson and Rock Springs) that consistently participated in the ASEP (meaning more than two years' participation over the past 15 years), the comparison grows to 47 percent stronger performance for the airports in participating years. **These trends suggest that the ASEP clearly has a strong positive effect on airport economic impact.**

Table 6: Average Passengers per Day in Subsidized Periods vs. Unsubsidized

	Average Passengers per Day		
Airport	Subsidized	Unsubsidized	% Variance
COD	147	112	31%
CPR	397	412	-4%
CYS	76	86	-12%
GCC	167	103	62%
JAC	1,519	1,009	51%
RIW	76	74	3%
RKS	119	82	45%

In addition to comparing subsidized performance versus unsubsidized performance within airports, a broader view of overall industry capacity trends was examined. The US commercial airline industry has experienced a contraction in overall seat capacity over the last 12 years driven by industry consolidation, regional airline pilot scarcity, and more conservative capacity planning. Total departing airline seats in the US declined by 3 percent from 2004 to 2015. **Figure 15** charts the percentage change in departing airline seats from 2004 to 2015 by state. While on a national basis total seats declined, **in Wyoming total departing seats increased by 17 percent**. In fact, Wyoming had the 4th highest percentage increase in seats among US states during this time frame. **It is evident that the ASEP influenced Wyoming's departing seats increase.**

Figure 15: Seat Capacity Change by State from 2004 to 2015



Most and Least Successful ASEP Investments

Table 7 highlights the five most successful ASEP investments as determined by their overall ROI. The top five routes were all from Jackson and required very little revenue guarantees, while generating large economic impacts ranging from $12 million to more than $30 million, largely driven by direct visitor spending. The largest overall ROI was 475.47 for a flight from Jackson (JAC) to Chicago (ORD).

Table 7: Most Successful ASEP Investments by ROI

ASEP Project	Route	Subsidy	Total Economic Impact	Tax Revenue	ROI
AERE505	JAC-ORD	$56,483	$26,911,788	$1,643,149	475.47
AERE505	JAC-DFW	$43,517	$20,733,962	$1,267,753	475.45
ASE10	JAC-DFW	$53,023	$24,786,475	$1,475,101	466.47
ASE10	JAC-ORD	$64,805	$30,265,628	$1,801,179	466.03
ASE02	JAC-DFW	$42,500	$12,707,763	$771,259	298.01

Table 8 highlights the five least successful routes subsidized through the ASEP, ranked by total ROI. The five least successful routes were in Cheyenne, Gillette and Rock Springs and were largely driven by the large subsidy amounts needed to ensure the profitability of the route for the air carrier. The smallest ROI was 0.98 for a RKS to SLC route. **Importantly, even the least successful ASEP investment resulted in economic impacts approximately two times the total of the initial investment**.

Table 8: Least Successful ASEP Investments by ROI

ASEP Project	Route	Revenue Guarantee	Total Economic Impact	Tax Revenue	ROI
ARASE42	CYS-SLC	$850,000	$3,079,061	$49,015	1.37
ARASE44	GCC-SLC	$619,996	$1,431,153	$58,570	1.31
ARASE29	RKS-SLC	$570,847	$1,292,132	$61,940	1.26
ARASE48	RKS-SLC	$1,233,452	$2,633,883	$70,651	1.14
ARASE38	RKS-SLC	$613,084	$1,214,368	$57,589	0.98

Additional Considerations

As an add-on to this evaluation of the 2004 through 2015 ASEP programs, this study reviewed the 2016 ASEP for the Sheridan airport. In this program, $1,528,000 was invested by WYDOT generating 9,166 enplanements and 5,133 incremental visitors. Visitor spending amounted to $2.9MM and total economic output from this program was $9.066MM for a return of $5.93 for each dollar invested (an ROI of 4.93).

In addition, the Laramie airport participated in an Essential Air Service (EAS) grant in 2016 for Laramie to Denver service that generated 14,979 enplanements, 7,924 incremental visitors, $5.3MM in visitor spending and $14MM in total economic output. While no WYDOT money was invested in this program, based on an EAS subsidy of $2,000,000, this flight produced an ROI of 6.0.

One other key consideration which should be factored into these program evaluations is that if an ASEP program pushes an airport above the 10,000 enplanement threshold in a given year, that airport becomes eligible for Airport Improvement Program (AIP) grants. AIP is an FAA managed program that provides funds to airports to improve safety and efficiency. In 2005, WYDOT's ASEP program pushed Riverton over that 10,000 enplanement threshold, and as a result, Riverton received $850,000 in AIP funds from the FAA. The economic impact of that $850,000 grant is over and above the $3.4MM in total economic output from the 2005 Riverton ASEP programs. Sheridan and Riverton will both likely surpass that enplanement threshold this year as a result of ASEP funding.

Conclusion

In summary, the ASEP has generated significant economic benefits for the State of Wyoming as a result of increasing the volume of traffic carried by improving air service connectivity. The program has also resulted in a net increase in tax revenue to the state, largely due to the tax revenue generated through visitor spending. Importantly, all of the flights subsidized through the ASEP resulted in economic benefits significantly larger than the investment made by the state. This suggests that the ASEP program provides a vital and responsible public investment of taxpayer dollars by the Wyoming Legislature. This is an investment that enhances access and economic performance in the state.

There are other significant economic benefits from increased air service over and above the direct and indirect benefits measured in this study. The quality of air service for a region helps drive key

business investments and growth of manufacturing and retail companies. In Cheyenne, enhanced air service helped attract Kohl's, Dillard's, Lowes, and Target to the city. These types of investments support hundreds of jobs in the local area. While these tertiary benefits are much more difficult to measure, it seems clear that while the economic impact of the ASEP as measured in this study are compelling and provide strong ROI's, the benefits are understated when overall economic investment is considered.

Appendix: Average Per Flight Economic Impacts by Airport

Figure 6: Average Enplanements Per ASEP Subsidized Route by Airport

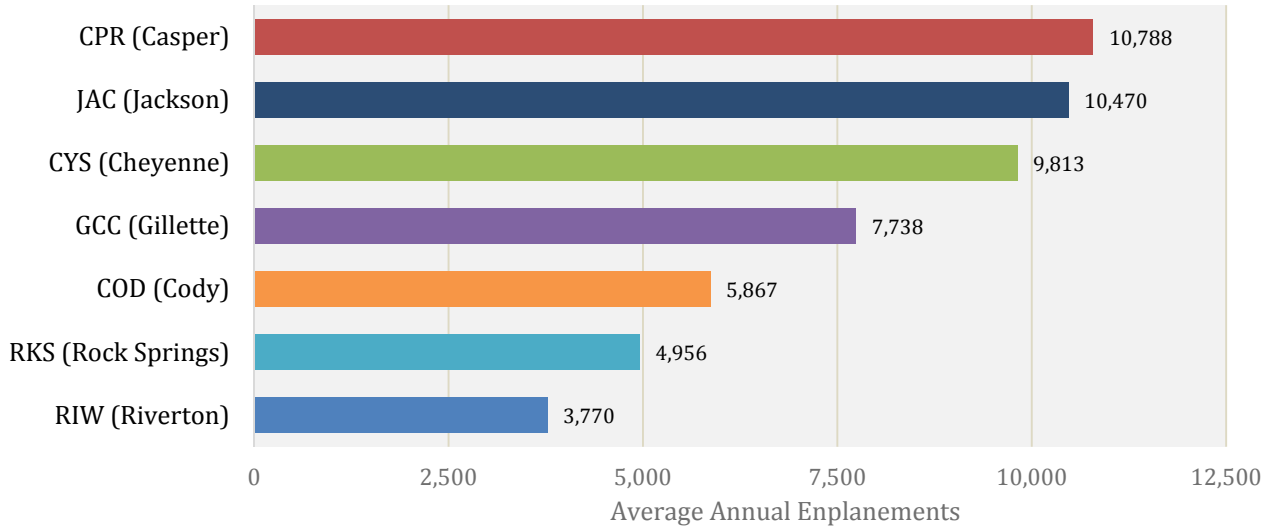


Figure 7: Average ASEP Revenue Guarantee Per Enplanement by Airport

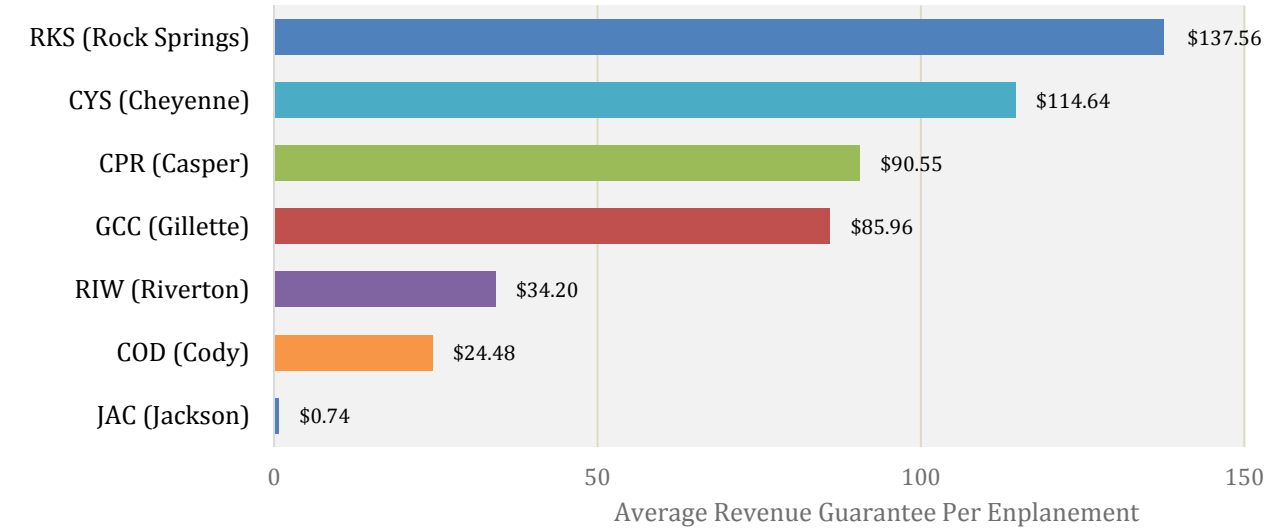


Figure 8: Average Economic Impact Per ASEP Route by Airport

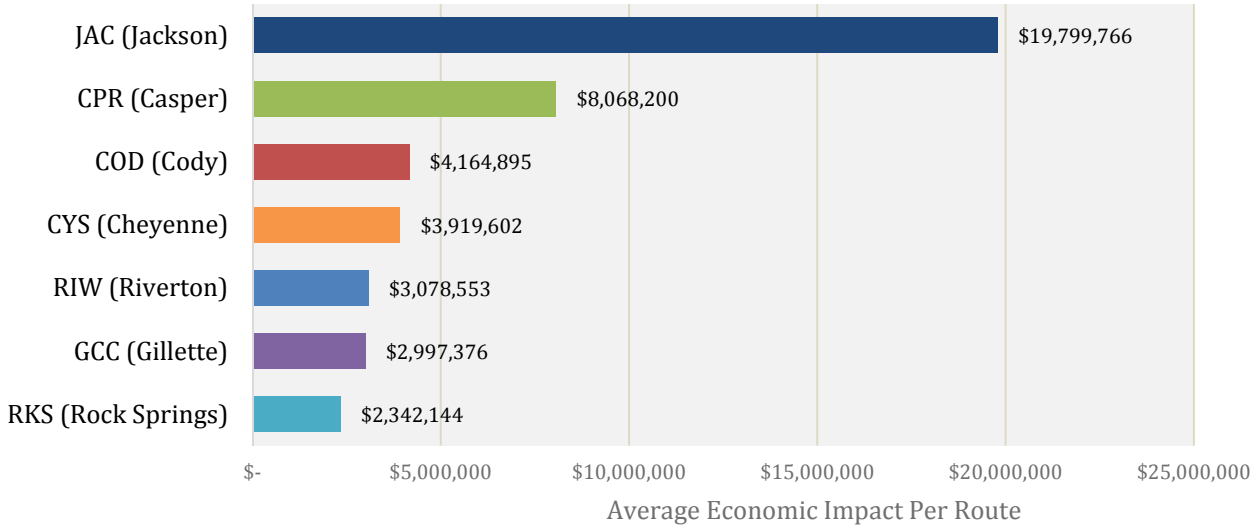


Figure 9: Average Visitor Spending Per ASEP Route by Airport

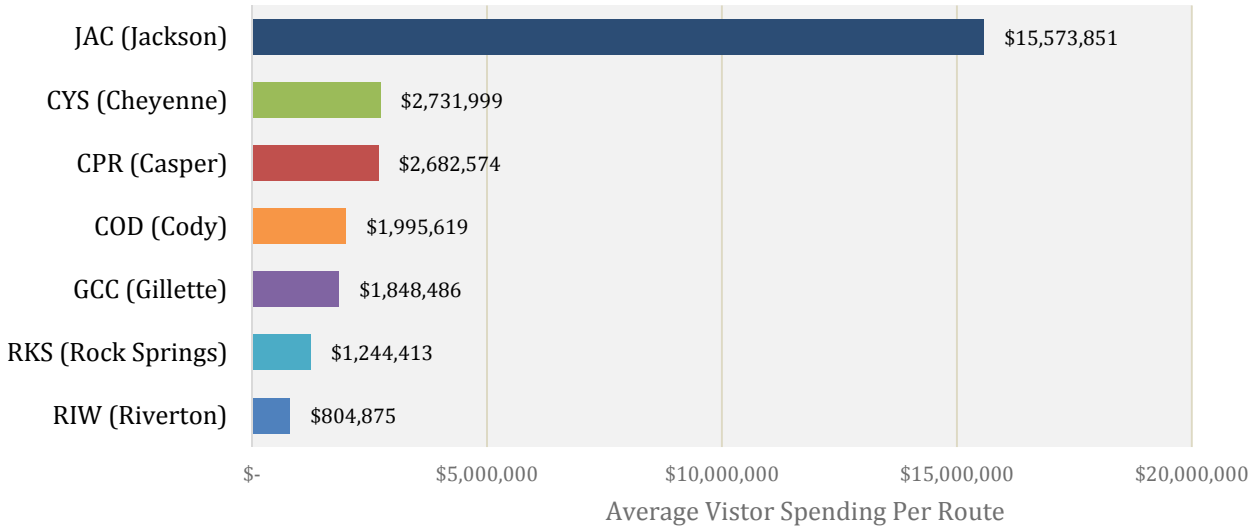


Figure 10: Average Jobs Supported Per ASEP Flight by Airport

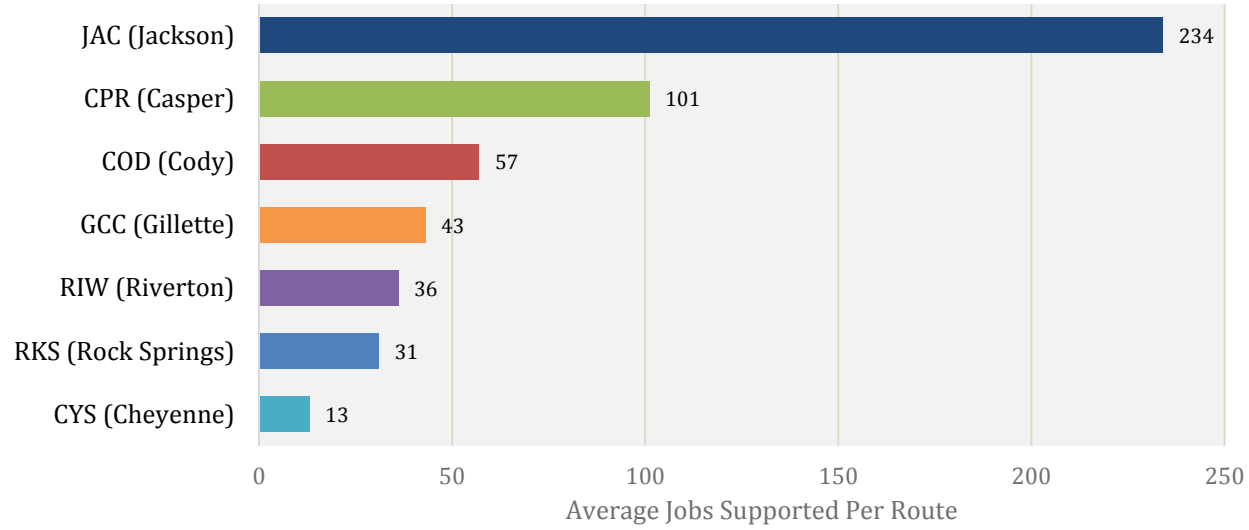


Figure 11: Average State Tax Revenue Generated Per ASEP Flight by Airport

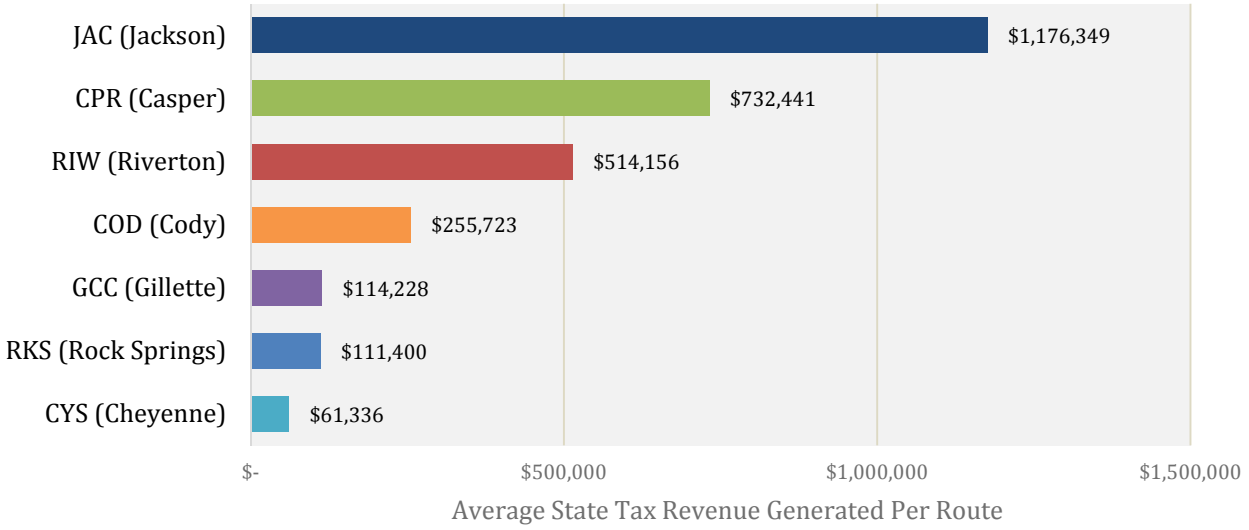


Figure 12: Average Return Per Dollar of Investment Per ASEP Flight by Airport

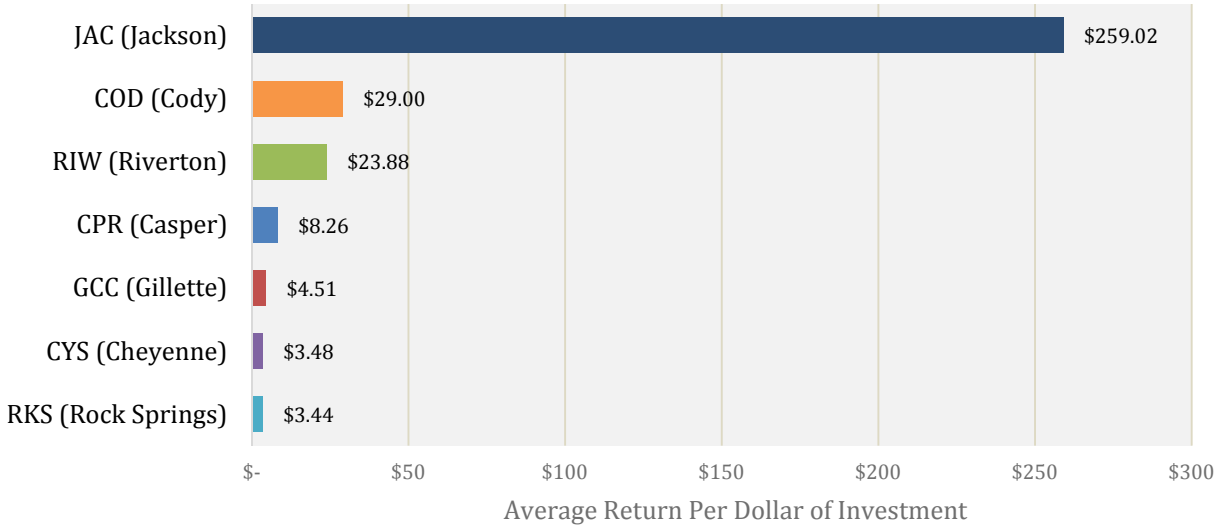


Figure 13: Average ROI Per ASEP Flight by Airport

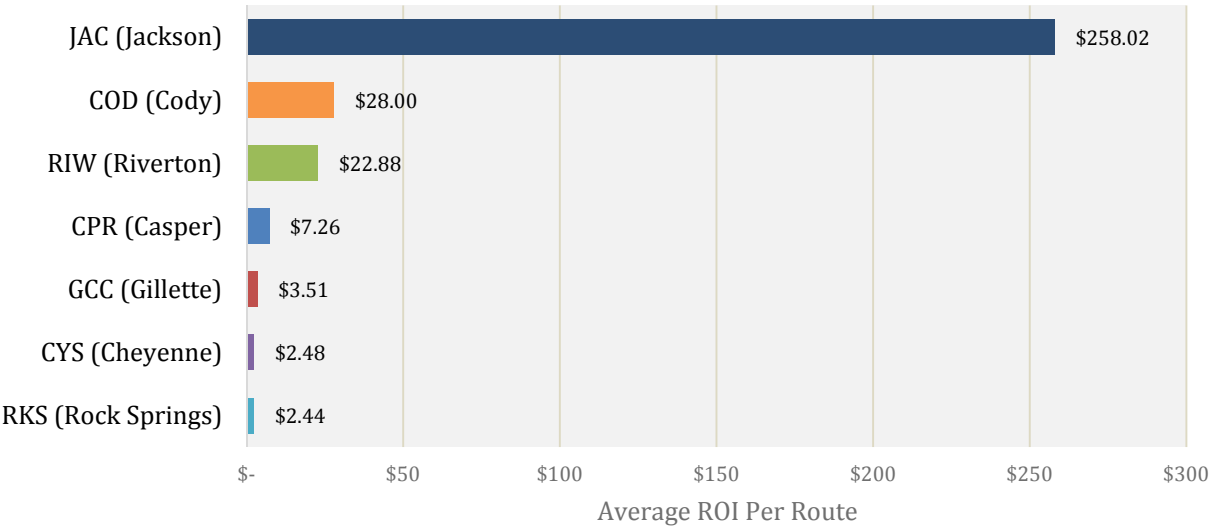


Figure 14: Average Passengers Per Day in Subsidized Years vs. Unsubsidized

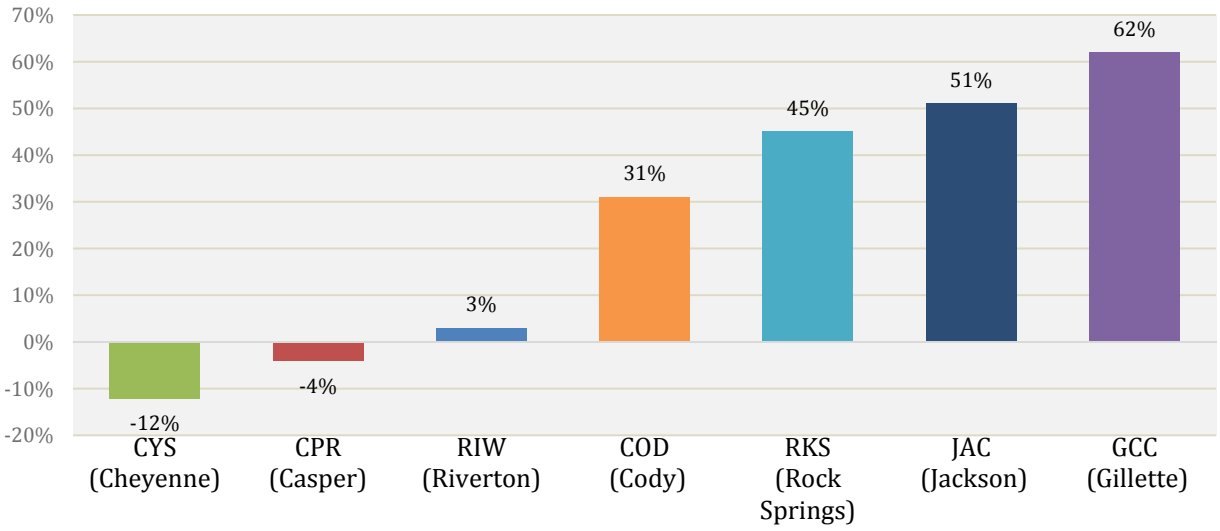


Table 9: Output Summary by ASEP Project

Project #	Start	End	Flight	Subsidy	Enplanements	Total Economic Output	ROI	State Tax Revenues
WBC01	6/1/2004	9/30/2004	COD-DEN	$117,600	7,776	$3,779,087	31.14	$275,719
ASE06	10/6/2004	6/6/2005	COD-DEN	$190,400	5,502	$4,175,560	20.93	$252,662
ASE07	7/6/2005	9/30/2005	COD-DEN	$114,400	8,111	$4,099,668	34.84	$126,486
AERE807	10/3/2005	6/11/2006	COD-DEN	$165,600	6,105	$4,147,238	24.04	$269,319
ASE09	6/7/2006	9/30/2006	COD-DEN	$0	7,470	$4,097,835	0.00	$290,521
ASE11	10/1/2006	6/7/2007	COD-DEN	$49,796	5,846	$4,548,962	90.35	$283,651
ASE14	10/1/2007	5/31/2008	COD-DEN	$208,551	5,067	$4,083,039	18.58	$246,472
ASE26	10/1/2008	5/31/2009	COD-DEN	$240,000	11,102	$7,978,858	32.25	$516,941
ASE25	10/1/2008	5/31/2009	COD-DEN	$320,000	5,277	$3,792,508	10.85	$245,416
ARASE33	10/1/2009	5/31/2010	COD-DEN	$382,500	5,065	$4,371,871	10.43	$254,986
ARASE37	10/1/2010	5/31/2011	COD-DEN	$233,978	7,425	$5,861,696	24.05	$366,160
ARASE46	10/1/2011	5/30/2012	COD-DEN	$28,764	8,661	$7,473,826	258.83	$448,373
ASCOD01	7/1/2012	6/13/2013	COD-DEN	$140,044	7,477	$6,571,458	45.92	$395,391
ASCOD03	6/1/2014	7/17/2014	COD-ORD	$0	482	$276,236	0.00	$19,801
ASCOD02	6/28/2014	7/17/2014	COD-ORD	$8,384	420	$225,806	25.93	$17,018
ASE13	6/7/2007	9/30/2007	COD-SLC	$97,907	2,088	$1,154,677	10.79	$82,644
ASE01	10/4/2004	9/30/2005	CPR-MSP	$1,633,520	18,268	$13,496,076	7.26	$1,282,015
ASE22	6/6/2008	10/25/2008	CPR-ORD	$320,000	3,307	$2,640,324	7.25	$182,866
AMERAIR	7/1/2010	6/30/2011	CYS-DFW	$1,400,000	12,488	$4,760,143	2.40	$73,656
ARASE42	7/1/2011	6/30/2012	CYS-DFW	$850,000	7,138	$3,079,061	2.62	$49,015
ASE04	5/1/2005	10/31/2005	GCC-DEN	$128,127	7,936	$3,546,770	26.68	$123,418
ASGCC03	2/2/2015	6/30/2015	GCC-DEN	$348,378	8,872	$3,600,452	9.33	$143,717
ARASE20	7/6/2008	6/30/2009	GCC-SLC	$799,036	5,979	$2,013,561	1.52	$80,096
ARASE28	7/1/2009	6/30/2010	GCC-SLC	$771,445	7,998	$2,960,809	2.84	$113,936
ARASE40	7/10/2010	12/31/2010	GCC-SLC	$615,398	4,323	$1,471,638	1.39	$58,869
ARASE44	1/1/2011	6/30/2011	GCC-SLC	$619,996	4,255	$1,431,153	1.31	$58,570
ARASE45	7/1/2011	6/30/2012	GCC-SLC	$1,186,230	9,197	$3,019,945	1.55	$125,524
ASGCC01	7/1/2012	6/30/2013	GCC-SLC	$1,052,480	9,865	$3,950,083	2.75	$146,158
ASGCC02	7/1/2013	6/30/2014	GCC-SLC	$836,812	11,502	$4,851,089	4.80	$177,666
ASGCC03	7/1/2014	6/30/2015	GCC-SLC	$293,203	7,451	$3,128,260	9.67	$114,322
ASE02	12/16/2004	4/2/2005	JAC-DFW	$42,500	7,489	$12,707,763	298.01	$771,259
AERE505	12/15/2005	4/3/2006	JAC-DFW	$43,517	12,089	$20,733,962	475.46	$1,267,753
ASE10	12/14/2006	4/9/2007	JAC-DFW	$53,023	13,318	$24,786,475	466.47	$1,475,101
ASE15	12/16/2007	4/6/2008	JAC-DFW	$86,600	11,283	$21,436,576	246.54	$1,262,517
ASE23	12/18/2008	3/31/2009	JAC-DFW	$100,800	12,500	$23,762,864	234.74	$1,410,922
ARASE27	12/18/2009	4/5/2010	JAC-DFW	$100,600	12,262	$23,852,326	236.10	$1,424,471
ARASE35	12/19/2010	3/30/2011	JAC-DFW	$48,900	6,189	$11,956,750	243.51	$714,180
ARASE41	12/11/2011	3/30/2012	JAC-DFW	$168,515	13,570	$28,130,985	165.93	$1,626,601
ARASE47	12/1/2012	4/30/2013	JAC-EWR	$90,677	929	$2,052,319	21.63	$200,348
ASJAC01	12/19/2013	4/30/2014	JAC-EWR	$0	2,380	$5,072,032	0.00	$297,534
ASJAC02	12/1/2015	4/30/2016	JAC-EWR	$76,083	6,679	$15,944,996	208.57	$809,279
ASJAC02	2/1/2014	4/30/2015	JAC-IAD	$24,290	1,738	$3,791,815	155.11	$217,167
ASE02	12/16/2004	4/2/2005	JAC-ORD	$82,500	14,500	$24,604,456	297.24	$1,493,291
AERE505	12/15/2005	4/3/2006	JAC-ORD	$56,483	15,691	$26,911,788	475.46	$1,643,149
ASE10	12/14/2006	4/9/2007	JAC-ORD	$64,805	16,262	$30,265,628	466.03	$1,801,179
ASE15	12/16/2007	4/6/2008	JAC-ORD	$113,400	14,799	$28,116,628	246.94	$1,655,942
ASE23	12/18/2008	3/31/2009	JAC-ORD	$99,200	12,310	$23,689,102	237.80	$1,400,194
ARASE27	12/17/2009	4/5/2010	JAC-ORD	$99,400	12,119	$23,621,337	236.64	$1,400,933
ARASE35	12/19/2010	3/30/2011	JAC-ORD	$101,100	12,815	$24,757,755	243.88	$1,478,810
CASE03	12/1/2004	8/31/2005	RIW-DEN	$128,934	3,770	$3,078,553	22.88	$514,156
ASE03	12/1/2004	8/31/2005	RKS-DEN	$99,086	837	$388,378	2.92	$94,034
ASRKS03	2/1/2015	6/30/2015	RKS-DEN	$472,330	6,800	$3,788,247	7.02	$163,982
ARASE21	7/1/2008	6/30/2009	RKS-SLC	$709,568	7,003	$2,984,621	3.21	$145,209
ARASE29	7/1/2009	12/31/2009	RKS-SLC	$570,847	2,922	$1,292,132	1.26	$61,940
ARASE38	1/1/2010	6/30/2010	RKS-SLC	$613,084	2,533	$1,214,368	0.98	$57,589
ARASE43	7/1/2010	6/30/2011	RKS-SLC	$1,177,342	6,389	$3,032,708	1.58	$142,300
ARASE48	1/1/2012	12/31/2012	RKS-SLC	$1,233,452	5,938	$2,633,883	1.14	$70,651
ASRKS02	1/1/2014	6/30/2014	RKS-SLC	$504,692	5,183	$2,371,497	3.70	$112,613
ASRKS01	1/1/2013	12/31/2014	RKS-SLC	$1,032,347	6,143	$2,730,189	1.64	$131,990
ASRKS03	7/1/2014	6/30/2015	RKS-SLC	$403,978	5,807	$2,985,421	6.39	$133,693
Totals				$21,550,602	464,700	$577,008,562	25.77	$30,800,175

GLOSSARY

Types of Economic Impact

Direct Impact – Direct impacts are those that are tied to the initial point of economic activity generated by commercial airports – the purchase of aviation goods and services on the airport, on-airport construction, and the spending by airline passengers passing through the region.

On-airport Direct Impacts – On-airport Direct Impacts are economic activity associated with businesses and government organizations located at the airport, which are directly related to the provision of aviation services. On-airport impacts include the employment, payroll, and spending of businesses such as airlines, ground handling services, retail and food vendors, airport management, operations staff, and government organizations. Capital expenditures of these businesses and government organizations are also included in direct impacts.

Employment – the number of employees who have jobs related to commercial airport activity. These are expressed in full-time equivalents, where two part-time jobs are assumed to equal one full-time job.

Payroll – the annual wages, salaries, and benefits associated with the jobs supported by airport activity.

Off-airport Direct Impacts (or Visitor Spending) – This category includes estimated non-local passengers (visitors) arriving via commercial airlines. The direct output of this group was assumed equal to their spending on hotel, food and beverage, transportation (but not including airfare or rental car, which were captured in the on-airport impacts), retail and entertainment expenses during their trip.

Multiplier Impacts – Multiplier impacts result from the re-circulation and re-spending of direct impacts within the economy. This re-spending of money can occur multiple times and takes two forms - **indirect** and **induced**. **Indirect impacts** occur when businesses spend their revenue on business expenses. **Induced impacts** occur when employees spend their earnings on goods and services. For example, as airport employees spend their salary for housing, food, and services, those expenditures circulate through the economy resulting in increased spending, payroll, and employment throughout the economy.

Total Economic Impacts – the economic activity generated by airports and associated activity. Total impacts are the sum of all direct (both on-airport and off-airport) and multiplier economic impacts (indirect and induced) attributable to an airport or the system of airports.

Revenue Guarantee – A program in which a non-airline entity guarantees a defined revenue performance threshold for a negotiated set of flights. If the operated flights produce less than the contracted revenue amount, the non-airline entity guarantees to make up the difference.

IMPLAN Economic Model - IMPLAN is a linear model that estimates purchases and sales between hundreds of sectors of the economy. The U.S. Forest Service, in cooperation with several other government agencies, initially developed the IMPLAN system to generate regional non-survey input-output models for individual regions and counties. This modeling process is considered one of the leading methods currently available for estimating the total economic impact of an industry and has been used to estimate economic impacts for individual airports and systems of airports throughout the country.

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