

# Economic Significance of Arizona Snowbowl to the Flagstaff and Coconino County, Arizona Regional Economy

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## Executive Summary

The objective of this analysis and report is to review the regional economic analysis contained in the Arizona Snowbowl Expansion FEIS, and provide additional analysis regarding any data gaps and apparent errors in the FEIS analysis. Additionally, where appropriate, re-estimation of regional economic impacts associated with the ski area expansion is presented. For this analysis, the Arizona Snowbowl Expansion FEIS and associated volumes were examined for statistical rigor, accuracy, and appropriate presentation of modeling results. Additionally, supporting documents to both the FEIS and subsequent analyses regarding the estimated economic impact of the proposed expansion were also reviewed along with newer socioeconomic reports and data to further inform the accuracy of the FEIS results. The primary findings of our analysis are that the FEIS failed in its attempt to:

- 1) Establish a statistically significant link between visitation to Snowbowl and economic activity in Flagstaff and Coconino County. No such link is shown in the FEIS or subsequent analysis.
- 2) Estimate the local area economic impact of increased visitation to the area associated with expansion and snowmaking. This impact analysis is severely flawed. Corrected estimates show the FEIS overstated impacts of the expansion by 130%.

Specific summary findings of this review and analysis of the FEIS are discussed below.

**(1) The reporting of basic statistical relationships contained in the FEIS is consistently misleading and the underlying statistical relationships are repeatedly either misinterpreted or not fully described.**

Section 1.0 of this report outlines a number of statistical relationships presented in the FEIS that are used to support the case for approval of the Arizona Snowbowl expansion. These relationships, as presented, often represent statistical correlations that are thus not “useful in predicting” some economic measure. These examples of misinterpretation occur repeatedly in the document. Models 1-6 in Section 1 show the correct estimation and interpretation of these statistical relationships.

**(2) The analysis of economic impact to Coconino County using IMPLAN input/output software and data is fundamentally flawed in its inclusion of spending by local skiers in the model. Re-estimation of this model correcting for the most obvious errors found the FEIS overstates the appropriately estimated impact of the expansion by 130%.**

Just the inclusion of local resident expenditures in the modeling and inappropriately indexing skier visits to projected population increases appear to have led to an overstatement of local area impacts in the range of 130%. Table 1 shows a comparison of the original FEIS and corrected FEIS IMPLAN model estimates of incremental impacts associated with expansion of the ski area.

**Table 1. Comparison of Original FEIS and Corrected IMPLAN Total Economic Output Impacts from Ski Area Expansion.**

<b>Statistic</b>	<b>Value of Total Output Original FEIS (million \$)</b>	<b>Value of Total Output Corrected FEIS</b>	<b>Overstatement in original FEIS (%)</b>
Total Economic Impact of Proposed Alternative over No-Action Alternative	\$17.23	\$7.49	\$9.74 (130%)

**(3) More recent surveys of Arizona Snowbowl visitors and their spending and associated estimates of economic impacts, while correcting for inclusion of local skiers in the analysis, have a severe aggregation error that leads to impacts being overstated yet again, this time by as much as 158%.**

The 2008-2009 study Economic Impact Summary reports a total estimated direct spending in the local economy by non-local Snowbowl visitors of \$15.838 million. Using the appropriate method of aggregating total expenditures of multiplying per-day expenditures by skier days yields a corrected estimate of \$6.13 million.<sup>1</sup> Therefore the 2008-2009 report overstates non-local spending by as much as 158% (Table 2).

**Table 2. Comparison of 2008-2009 Winter Visitor Study Estimated Direct Economic Impact and Corrected Estimates.**

<b>Spending Sector</b>	<b>2008-2009 Study</b>	<b>Corrected Estimate</b>	<b>% Overstatement in 2008-09 Study</b>
Lodging	\$ 2,757,403	\$ 1,060,539	160%
Food & Drink	\$ 4,742,105	\$ 1,838,011	158%
Other Spending	\$ 8,339,095	\$ 3,232,184	158%
<b>Total</b>	<b>\$ 15,838,603</b>	<b>\$ 6,130,734</b>	<b>158%</b>

<sup>1</sup> The 2008-2009 study inappropriately multiplied “per-trip” average spending by the number of skier “days.” This had the result of overstating skier spending significantly.

**(4) While the FEIS paints a picture of Arizona Snowbowl as being important to the Flagstaff (and Coconino County) economy, the analyses contained in the FEIS show no statistically significant relationship between visitation to Arizona Snowbowl and winter tourism economic activity in Flagstaff.**

While the FEIS analysis demonstrates a close relationship between annual snowfall or annual ski days of operation and the number of skiers visiting the ski area, the analysis presented in the FEIS showed no statistically significant relationship between number of annual skier days at Snowbowl and an index measuring winter tourism spending in the Flagstaff area.

Table 3 begins with the data in Table 3E-28 of the FEIS and adds winter (December-March) recreational visitation to Grand Canyon NP to the analysis. This estimated model includes both Arizona Snowbowl visitation and Grand Canyon NP Visitation for 12 winter seasons.

**Table 3. Linear Regression of FEIS Table 3E-28 Winter Tourism Activity Proxy Index on Annual Snowbowl Skier Days and December-March Grand Canyon NP Visitation: Dec 1990-March 2002**

<i>Regression Statistics</i>						
Multiple R	0.853					
<b>R Square</b>	<b>0.728</b>					
Adjusted R Square	0.668					
Standard Error	0.124788235					
Observations	12					
<i>ANOVA</i>						
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>	
Regression	2	0.375522	0.187761	12.05752	0.002844312	
Residual	9	0.140149	0.015572			
Total	11	0.515671				
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	0.866321175	0.358591	2.42	0.0389	0.055131946	1.6775104
<b>Arizona Snowbowl Ski-days</b>	<b>0.0000007</b>	<b>6.18E-07</b>	<b>1.16</b>	<b>0.2740</b>	-6.78222E-07	2.1183E-06
<b>Grand Canyon NP Visits</b>	<b>0.0000021</b>	<b>4.44E-07</b>	<b>4.81</b>	<b>0.0010</b>	0.0000011	0.0000031

Several important results are shown in the model. First, a statistical model which included only Arizona Snowbowl visitation (Model 4 in Section 1) showed that ski visitation to Snowbowl only explained about 2.9% of the variation in annual Flagstaff winter tourism economic activity. However, the model showed that Snowbowl visitation was not a statistically significant variable in predicting this variation in winter tourism spending. Table 3 however, shows that after adding Grand Canyon NP visitation as an explanatory variable, fully 72.8% of winter tourism activity (as defined in the FEIS) is explained by the model. Further, while visitation to Arizona Snowbowl remains a non-significant explanatory variable, visitation to Grand Canyon NP is highly significant (at the 99% level of confidence).

It should be noted that within this regression model Grand Canyon NP, an attraction that is 80 miles away (South Rim), is highly explanatory of winter economic activity in Flagstaff while Arizona Snowbowl, that sits only 7 miles from Flagstaff, has no explanatory power at all. This underscores the consistent result of our analysis that the level of economic activity associated with the operation of Snowbowl is insignificant within the context of the overall level of winter economic activity in the county. Additionally, this skier spending is even very small in the context of other recreational/tourism spending (for example, by Grand Canyon NP visitors) within the county.

**(5) A comparison of the economic impact of visitor spending on the overall economy of Coconino County between visitors to Grand Canyon NP and visitors to Arizona Snowbowl shows that spending by non-local skiers has a trivial impact on the overall economy of the county, and is also trivial in comparison to the impact of Grand Canyon visitor spending.**

The relative importance of the proposed Arizona Snowbowl expansion is put in the context of the overall size of the Coconino County economy and further compared it to the impact of Grand Canyon Visitor spending on the county economy below (Table 4). The comparison shows that spending by visitors to the Grand Canyon accounts for roughly 15% of total economic activity in the county and 8% of labor income. The proposed expansion and addition of snowmaking to Arizona Snowbowl has, by comparison, a very tiny and, as detailed above, uncertain impact on the county economy. The incremental impact of the Snowbowl expansion plans is estimated to account for **less than two-tenths of one percent** of county economic activity, and only **nine one-hundredths of one percent** of labor income in the county. This comparison for total economic activity is also shown graphically below.

Table 4. Comparisons of Total Coconino County Economic Activity (2009 IMPLAN) to Activity Attributable to Grand Canyon Visitor Spending (2005 NAU Estimate) and Incremental Activity Associated with Proposed Arizona Snowbowl Expansion (2003 FEIS Data).

Economic Measure	Coconino County	Impact of Grand Canyon NP Visitors	Incremental Impact of Snowbowl Expansion
Gross Regional Product (Total Output)	4,683.6 <sup>1</sup> (100%) <sup>2</sup>	686.7 (14.7%)	7.5 (0.16%)
Labor Income (Includes both employee compensation and proprietor income)	3,154.3 (100%)	239.7 (7.6%)	2.8 (0.09%)

<sup>1</sup> Values are in millions of dollars.

<sup>2</sup> Percent of Coconino County total

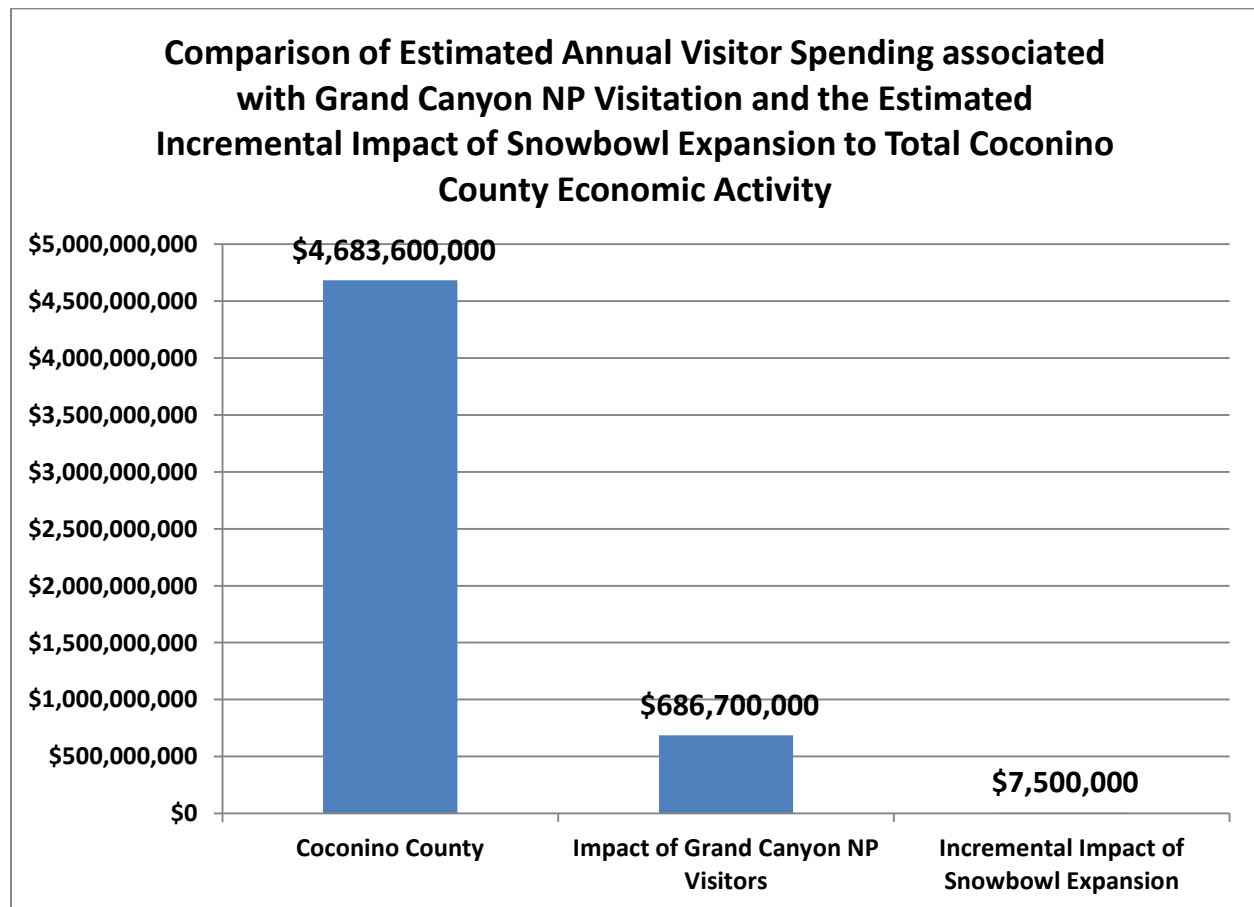


Figure 1. Comparison of Estimated Annual Visitor Spending associated with Grand Canyon NP Visitation and the Estimated Incremental Impact of Snowbowl Expansion to Total Coconino County Economic Activity



## 1.0 General Issues of Concern Regarding the Arizona Snowbowl FEIS Analysis

The Arizona Snowbowl Expansion FEIS and supporting material provide minimal supporting data with which to examine the assumptions, calculations, and estimates contained in the EIS. Estimation methods for many parameters are only generally described, and insufficient detail is included to allow replication of the estimates contained in the EIS.<sup>2</sup>

Where replication of the results reported in the EIS was possible given the information contained in the EIS, use of statistical regression and trend analysis is very poorly documented within the document and many conclusions presented are not statistically supported by the modeling referenced in the document. A consistent area of statistical misinterpretation in the EIS concerns the “fit” of estimated linear regression models.

In a simple linear regression model, changes in one variable, called the explanatory variable, (such as annual skier visits to Snowbowl) are used to explain changes in another variable, called the dependent variable, (such as the level of winter tourism in the Flagstaff economy). Two key results from any simple linear regression are the R-square statistic (also called the coefficient of determination) and the standard error of the explanatory variable(s). The R-square statistic (which ranges from 0 to 1) gives the percent of the variation observed in the dependent variable that is explained by variation in the explanatory variable(s). The EIS consistently interprets the R-square as the percent of time that a specific explanatory variable is useful in predicting changes in the dependent variable.<sup>3</sup> In fact, the R-square has nothing to do with prediction, and only with explanation. The “standard errors” of the estimated coefficients for the explanatory variables are the key parameters used for determining whether a variable is useful in “predicting” another variable. The linear regression analyses in the EIS ignore these key standard error statistics in their discussions of the regressions. As a result, the EIS discussion time and again asserts the existence of a statistically significant predictive relationship between variables when none exists.

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<sup>2</sup> For example, the EIS describes how skier visit projections were arrived at in the following way. “The factors that were considered included; change in lift capacity, change in skiing terrain, development of tubing/snowplay facility, change in parking capacity, development of snowmaking capability and potential population growth in the region.” (page 3-87). Another example from page 3-89 describes how predicted visitor spending was estimated as simply “based on surveys of skier expenditures in several western states including Colorado and Utah and data from *The Arizona Snowbowl Snow Users Survey*.” No additional data or explanation of the development of the estimates was given.

<sup>3</sup> Examples of this type of language can be found on page 3-119 of the EIS as well as throughout the document.

## 1.1 Examples of unsupported statistical conclusions:

1) The document states that from 1996-2003 for skier visits in the Pacific West “the overall trend has been positive.” In fact, a simple trend analysis of this data (Table 5) shows that while the trend is positive, statistically it is not different from zero even at the 75% level of confidence ( $p=0.279$ ). As the linear regression results in Model 1 (Based on the FEIS data) show, from a statistical perspective the data for the Pacific West Skier Days in Table 3E-10 shows no significant trend over time.

Table 5. Table 3E-10 (FEIS) Data for Pacific West Skier Trends

Table 3E-10 (FEIS) Data for Pacific West Skier Trends		
Year	Trend	Pacific West Annual Skier Visits (millions)
1996/97	0	9.84
1998	1	11.17
1999	2	11.08
2000	3	10.61
2001	4	11.28
2002	5	12.13
2003	6	10.6

Source: FEIS Table 3E-10

### MODEL 1: Estimated Trend in 1996-2003 Pacific West Skier Days (Table 3E-10).

<i>Regression Statistics</i>						
Multiple R	0.477202					
R Square	0.227722					
Adjusted R Square	0.073266					
Standard Error	0.684815					
Observations	7					
<i>ANOVA</i>						
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>	
Regression	1	0.691429	0.691429	1.474351	0.278875	
Residual	5	2.344857	0.468971			
Total	6	3.036286				
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	10.48714	0.466623	22.47457	3.24E-06	9.287651	11.68663
trend	0.157143	0.129418	1.214229	0.278875	-0.17554	0.489822

2) Despite the assumption in the FEIS that there is an overall positive trend in Snowbowl visits over time<sup>4</sup>, statistical analysis of skier visits over time based on the data from the FEIS shows that when controlling for number of days open and annual snowfall, there is no statistically significant trend in Arizona Snowbowl skier visits. Model 2 shows that while both annual snowfall and days open (for ski area) are both statistically significant explanatory variables for annual skier visits, there is no statistically significant trend over time in ski area visits.

Table 6. Arizona Snowbowl Skier and Snowfall Data, 1982-2003

<b>Arizona Snowbowl Skier and Snowfall Data, 1982-2003</b>				
<b>YEAR</b>	<b>Annual Snowbowl Skier Days</b>	<b>Days Open</b>	<b>Annual Snowfall</b>	<b>Trend</b>
1982	63000	123	265	0
1983	99626	135	276	1
1984	28,913	64	76	2
1985	114707	118	266	3
1986	105252	124	210	4
1987	125252	112	290	5
1988	119259	92	182	6
1989	120132	79	170	7
1990	99280	74	240	8
1991	106000	112	233	9
1992	173000	134	360	10
1993	181000	130	460	11
1994	116388	114	220	12
1995	176778	122	259	13
1996	20312	25	113	14
1997	153176	109	270	15
1998	180062	115	330	16
1999	35205	60	150	17
2000	66152	45	180	18
2001	162175	138	272	19
2002	2872	4	87	20
2003	87354	96	206	21

Source: FEIS Table 3F-1.

<sup>4</sup> Pages 3-87-88 of the EIS state that under Alternative 1 Snowbowl annual visits are projected to increase from an average 98,000 to 110,500 over 10 years due to population increases. No evidence is provided, however, that past changes in population have been correlated with increases in skier visits.

**Model 2. Explanatory model of total skier visits as a function of ski area days open and annual snowfall, plus an annual trend variable.**

<i>Regression Statistics</i>						
Multiple R	0.973296					
R Square	0.947305					
Adjusted R Square	0.889127					
Standard Error	29214.61					
Observations	22					
<i>ANOVA</i>						
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>	
Regression	3	2.92E+11	9.72E+10	113.8552	6.8E-12	
Residual	19	1.62E+10	8.53E+08			
Total	22	3.08E+11				
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	0	#N/A	#N/A	#N/A	#N/A	#N/A
Daysopen	474.3668	265.6398	1.785752	0.090111	-81.6238	1030.357
trend	504.8824	829.5121	0.60865	0.549965	-1231.31	2241.071
snowfall	250.113	120.3172	2.07878	0.051427	-1.71377	501.9397

3) Page 3-119 reports several statistical relationships between winter tourism activity in the Flagstaff area and skier visits, snowfall, and days open for the ski hill. Unfortunately, the FEIS provides an inaccurate interpretation of the meaning of several key parameters of the statistical relationships, and ignores other ones. There is no real debate that annual skier visits at Snowbowl are positively correlated with both annual days of operation, and annual snowfall. However, the data on correlation between Snowbowl skier visits, snowfall, or days open for the hill, and winter tourism activity in Flagstaff shows no statistical relationship.

- Based on the 1990-2003 data presented in Table 3E-28 of the FEIS, snowfall is not statistically significant as an explanatory variable for the level of winter tourism in Flagstaff. Model 3 shows that annual snowfall is not a statistically significant predictor of winter tourism in Flagstaff (p=.30).

Table 7. Arizona and Flagstaff Data on 1991-2003 Characteristics of Operation Snowfall and Flagstaff Winter Tourism Activity

Arizona and Flagstaff Data on 1991-2003 Characteristics of Operation Snowfall and Flagstaff Winter Tourism Activity.				
Year	Snowfall (inches)	Skier Visits	Days Open	Winter Tourism Proxy
1991	233	106000	112	1.945
1992	360	173000	134	2.275
1993	460	181000	130	2.315
1994	220	116388	114	2.456
1995	259	176778	122	2.592
1996	113	20312	25	2.569
1997	270	153176	109	2.58
1998	330	180062	115	2.667
1999	150	35205	60	2.548
2000	180	66152	45	2.67
2001	272	162175	138	2.656
2002	87	2872	4	2.636
2003	206	87354	96	

Source: FEIS Table 3E-28

### Model 3. Estimated Explanatory Model of Snowfall and Flagstaff Winter Tourism Activity

<i>Regression Statistics</i>						
Multiple R		0.325219				
R Square		0.105768				
Adjusted R Square		0.016344				
Standard Error		0.214739				
Observations		12				
ANOVA						
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>	
Regression	1	0.054541	0.054541	1.182775	0.302309	
Residual	10	0.46113	0.046113			
Total	11	0.515671				
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	2.654162	0.161126	16.4726	1.42E-08	2.295151	3.013173
Snowfall	-0.00066	0.000608	-1.08755	0.302309	-0.00202	0.000694

- For the same period and based on the same data, annual skier visits is not statistically significant as an explanatory variable for Flagstaff winter tourism activity. Model 4 shows that annual skier days has almost no explanatory power and is nowhere near statistically significant as a predictor of winter tourism activity in Flagstaff.

**Model 4. Estimated Explanatory Model of Annual Snowbowl Skier Days and Flagstaff Winter Tourism Activity**

<i>Regression Statistics</i>						
Multiple R	0.170524					
R Square	0.029079					
Adjusted R Square	-0.06801					
Standard Error	0.223758					
Observations	12					
<i>ANOVA</i>						
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>	
Regression	1	0.014995	0.014995	0.299495	0.5962	
Residual	10	0.500676	0.050068			
Total	11	0.515671				
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	2.555191	0.131643	19.40996	2.88E-09	2.261872	2.848511
Skidays	-5.5E-07	1E-06	-0.54726	0.5962	-2.8E-06	1.68E-06

- An additional analysis not presented in the EIS shows annual days open for the ski hill is not statistically significant as an explanatory variable in predicting Flagstaff winter tourism activity. As in Models 3 and 4, Model 5 shows no statistically significant relationship between days of operation for the ski area and winter tourist activity in Flagstaff.

**Model 5. Estimated Explanatory Model of Annual Days of Snowbowl Winter Operation and Flagstaff Winter Tourism Activity**

<i>Regression Statistics</i>						
Multiple R	0.359636549					
R Square	0.129338447					
Adjusted R Square	0.042272292					
Standard Error	0.211890264					
Observations	12					
<i>ANOVA</i>						
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>	
Regression	1	0.066696	0.066696	1.485519	0.250884	
Residual	10	0.448975	0.044897			
Total	11	0.515671				
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	2.64833	0.141795	18.67723	4.19E-09	2.332393	2.96427
Daysopen	-0.00168	0.001385	-1.21882	0.250884	-0.00478	0.001398

It is important to note that even if one were to argue for some marginal predictive power of these variables in regard to winter tourism activity in Flagstaff, all three measures of Arizona Snowbowl use (skier visits, days open, snowfall) are weakly negatively correlated with winter tourism activity in Flagstaff.

4) As noted, the EIS uses projected population growth in Flagstaff to project future commensurate increases in Snowbowl visitation. The EIS does not present any analysis of past trends in population and skier visits to justify this assumption. In fact, use of US Census population estimates for Flagstaff and annual Snowbowl skier days shows no statistical correlation for the years of data presented in the FEIS. Model 6 shows that any marginal relationship between population and Snowbowl visits argues for increased population leading to lower visitation to the ski hill. In any event, the relationship is not statistically significant.

**Model 6. Estimated Statistical Relationship between Flagstaff Population and Snowbowl Annual Skier Visits.**

<i>Regression Statistics</i>						
Multiple R		0.351116				
R Square		0.123282				
Adjusted R Square		0.043581				
Standard Error		63442.27				
Observations		13				
<i>ANOVA</i>						
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>	
Regression	1	6.23E+09	6.23E+09	1.546799	0.239461	
Residual	11	4.43E+10	4.02E+09			
Total	12	5.05E+10				
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	371151	208836.2	1.777235	0.103154	-88494.4	830796.4
flagstaff	-4.71577	3.791717	-1.2437	0.239461	-13.0613	3.62974

5) On p.3-99 of the FEIS the statement is made “While [under Alternative 2] the Snowbowl would still not be a major drive [sic] of the Flagstaff area economy, the importance of 564 full-time equivalent jobs is difficult to overstate.” In fact, the FEIS does a fair job of overstatement in that the “564 jobs” is really only a change from their estimated no-action baseline of 303 jobs, and it appears that this number is also inflated to some extent by inclusion of some local skier spending in the estimates of change.

**1.2 Putting the EIS Projections in Context**

In 2009 the Coconino County economy had a total output (GDP) of \$4.83 billion.<sup>5</sup> The FEIS predicts that ten years following the completion of the Snowbowl expansion, total increased output in the county attributable to the expansion will be \$15.76 million.<sup>6</sup> This amount is 0.32% of total 2009 output. Assuming that the county economy grows over the next 10 years, the

<sup>5</sup> <http://www.bea.gov> GDP by Metropolitan Area, Flagstaff, AZ (MSA) [22380]

<sup>6</sup> FEIS page 3-98



incremental change attributable to Snowbowl would be even smaller. The Coconino County economy (GDP) has grown at an average rate of approximately 7% per year for the period 2003-2009.<sup>7</sup> The predicted increase in county GDP from the FEIS amounts to only about 5% of the historical annual growth of the county absent any new ski facilities. In short, in terms of the overall county economy the projected increment to GDP attributable to the ski expansion would be negligible.

This result is entirely consistent with the findings within the FEIS and in additional analysis presented here that visitation to Arizona Snowbowl during the winter months is not statistically significantly correlated with winter economic tourism activity within Flagstaff (Models 3, 4, and 5 above).

## 2.0 Errors in the FEIS Economic Impact Analysis.

As noted above, the FEIS provides very thin documentation associated with its statistical modeling and, more importantly, its regional economic impact analysis. However, some individual insights into the modeling assumptions and methods employed in estimating the impacts presented in the FEIS can be gleaned from the responses of the EIS preparers to public comments.<sup>8</sup>

While the FEIS (p.3-89) recognizes that the spending of non-local skiers is most important in defining stimulus to the local economy, in the FEIS Volume 2, the study author(s) admit and defend the fact that they included spending by all visitors to Snowbowl (local and destination) in their estimates. The authors state,

While destination skiers spend more on a per capita basis, the spending of both destination and day skiers is fully relevant to the analysis. Day visitors make expenditures both at the ski area and outside the ski area that they would not otherwise make if they weren't skiing. These include: lift tickets; ski related services (rentals, lessons); purchases at retail shops; gasoline; convenience store items, etc. These expenditures are listed in the table above. All of these expenditures are *incremental* – they would not occur if the visitor were not skiing.

Finally, it appears that the commentor is suggesting that expenditures made by local persons do not have an impact on the economy. This is clearly not the case.

(FEIS Volume 2, Page 144)

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<sup>7</sup> <http://www.bea.gov>

<sup>8</sup> Coconino NF & Coconino County. 2005. Final Environmental Impact Statement for the Arizona Snowbowl Facilities Improvements Proposal, Volume 2: Response to Comments on the Draft Environmental Impact Statement. February 2005.

As a point of fact, inclusion of expenditures from those people who live within the analysis area is widely recognized as a fundamental error in estimating local area economic impacts. The FEIS authors could have referenced, for instance, the software manual for the IMPLAN program they used to estimate impacts. In the chapter on Impact Analysis, the instruction manual cautions:

“It is important to identify which visitors are from out-of-town and which are local. Including local visitors is not usually desirable since they could have spent their money locally elsewhere (merely shifting expenditures from one local activity to another).”<sup>9</sup>  
(Minnesota IMPLAN Group, 2004. p. 179)

This view of accepted practice in impact modeling is widely shared. For instance VanBlarcom (2007) identifies it as one of the four common errors found in economic impact studies.<sup>10</sup> He writes,

“Event-related expenditures made by local residents do not represent an injection of new money into the local economy and therefore should not be included in the impact assessment.”

Similarly, the primary director/author of the National Park Service’s Money Generation Model (MGM2) for economic impact analysis similarly identifies the inclusion of spending by local residents as a common error in economic impact analysis and writes,

“An **impact analysis** only includes spending by visitors who reside outside of the local region. Their spending constitutes “new dollars” to the region.”<sup>11</sup>

Dr. John Crompton, Distinguished Professor in the Department of Recreation, Park and Tourism Sciences at Texas A&M University wrote in his 2006 paper “Economic Impact Studies: Instruments for Political Shenanigans?”<sup>12</sup>

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<sup>9</sup> The IMPLAN manual says that inclusion of local resident spending is “usually” not desirable. The exception is the case where the analysis presented is a “significance” analysis, showing the relative size of economic activity tied to an industry, rather than an “impact” analysis. The FEIS authors clearly identify and present their analysis as an impact analysis—thus it should not include resident spending in its estimates.

<sup>10</sup> VanBlarcom, B. 2007. “Assessing the Economic Impact of Sport/Recreation/Cultural Events/Facilities: A Guide. Working paper, Acadia University.

<sup>11</sup> Stynes, D. “Economic Impact Concepts.” Retrieved from [http://35.8.125.11/mgm2\\_new/econ/concepts.htm](http://35.8.125.11/mgm2_new/econ/concepts.htm)

<sup>12</sup> Crompton, J. 2006. “Economic Impact Studies: Instruments for Political Shenanigans?” *Journal of Travel Research* Vol. 45, August 2006, pp.67-82.

### **“Including Local Residents: the most Frequent Mischievous Procedure**

Only those visitors who reside outside the jurisdiction and whose primary motivation for visiting is to attend a tourism attraction or who stay longer and spend more time there because of it should be included in an economic impact study.

Expenditures by those who reside in the community do not contribute to an event’s economic impact because these expenditures represent a recycling of money that already existed there. There is no economic growth, only a transfer of resources between sectors of the local economy.” (p. 70)

Within the economic literature there is no real debate that spending by local area residents should not be included in economic impact analyses. As Crompton notes,

“Unfortunately, the widespread admonition from economists to disregard locals’ expenditures is ignored frequently, because when expenditures by local residents are omitted, the economic-impact numbers often become too small to be politically useful.” (Crompton, p. 70)

The inclusion of estimated spending by Flagstaff and Coconino County residents in the FEIS analysis is a significant error, and results in a large overstatement of the size of impacts associated the Snowbowl expansion.

## **2.1 FEIS Impact analysis corrected for IMPLAN modeling errors**

In an effort to correct for the most obvious errors in the FEIS impact analysis, an IMPLAN economic impact analysis was conducted using most of the primary inputs from the FEIS analysis, but correctly excluding spending by local residents from the analysis and not adopting the unsupported assumption that skier days are proportional to projected local area population levels. Table 8 below shows the inputs for the IMPLAN analysis.

**Table 8. Corrected Inputs for IMPLAN Economic Impact Analysis.**

<b>Input</b>	<b>Value No-Action</b>	<b>Value Proposed Alternative</b>	<b>Source</b>
Destination (non-local) Skiers	33,908	79,005	FEIS Table 3-E-13 p.3-92 <sup>1</sup>
Food & Beverage Spending	1,094,000	2,550,000	FEIS Vol 2 p. 143 destination skier spending per day * # destination skiers
Retail Spending	1,704,000	3,970,000	
Hotel & Lodging Spending	1,195,000	2,784,000	
Services Spending	487,000	1,135,000	
Lifts & Ski School Spending	1,145,000	2,667,000	
Analysis Area Economic Data	IMPLAN 2008 Coconino County data and 2008 structural matrices		

<sup>1</sup> Corrected to reflect the lack of statistical correlation between population and skier days.

Table 9 shows the original and corrected aggregate visitor spending estimates for use in the IMPLAN modeling. It is clear from the table that inclusion of local-area skiers in the modeling led to a very substantial overstatement of incremental skier spending.

**Table 9. Original FEIS and Corrected Aggregate Visitor Spending Inputs for IMPLAN Analysis.**

<b>Statistic</b>	<b>Value Original FEIS (million \$)</b>	<b>Value Corrected FEIS</b>	<b>Overstatement in original FEIS</b>
Total Visitor Spending (No-Action Alternative)	\$11.0	\$5.6	\$5.4 (96%)
Total Visitor Spending (Proposed Action)	\$23.7	\$13.1	\$10.6 (81%)
Change of Proposed Action from No-Action	\$12.7	\$6.8	\$5.9 (87%)

Table 10 shows the estimated total output values returned from the IMPLAN modeling. In total, it is estimated by the IMPLAN model that total output in the Coconino County economy would increase by 7.49 million dollars annually under the expansion scenario when compared to the no-action baseline.

**Table 10. Estimated Incremental Impact of Added Destination Skier Spending from IMPLAN modeling.**

<b>Impact Type</b>	<b>Labor Income</b>	<b>Output</b>
Direct Effect	\$2,018,000	\$5,278,000
Indirect Effect	\$283,000	\$830,000
Induced Effect	\$487,000	\$1,387,000
<b>Total Effect</b>	<b>\$2,788,000</b>	<b>\$7,494,000</b>

Table 11 shows a comparison of the original FEIS and corrected FEIS IMPLAN model estimates of incremental impacts associated with expansion of the ski area. Overall, just the inclusion of local resident expenditures in the modeling and inappropriately indexing skier visits to projected population increases appear to have led to an overstatement of local area impacts in the range of 130%.

**Table 11. Comparison of Original FEIS and Corrected IMPLAN Total Economic Output Impacts from Ski Area Expansion.**

<b>Statistic</b>	<b>Value of Total Output Original FEIS (million \$)</b>	<b>Value of Total Output Corrected FEIS</b>	<b>Overstatement in original FEIS (%)</b>
Total Economic Impact of Proposed Alternative over No-Action Alternative	\$17.23	\$7.49	\$9.74 (130%)

It must be noted that the above analysis only corrects for the obvious errors associated with inclusion of local skier expenditures in the analysis and indexing skier visits to projected population levels in the county in the original FEIS. There remain additional questions regarding the appropriateness of other components of the predictions of skier days for destination skiers in the FEIS as well.

In any event, the IMPLAN analysis findings, both in the FEIS and in the corrected estimates above, underline the basic finding that the impact to the Coconino County economy of expanding the ski area is insignificant even in the context of the long term annual growth rate of the economy, let alone in the overall size of the economy.

### 3.0 Effect of Updated Arizona Snowbowl Visitor Survey Data on Estimated Impacts

At its most basic level, the construction of a local area economic impact estimate of increased visitor spending relies on three pieces of information,

- 1) The average amount they spend per visitor (and some understanding of what they buy)
- 2) The number of new visitors from outside the local area that come to the area for an activity.
- 3) Data on the size and structure of the local economic area.

As noted, the FEIS is not specific about the calculations of average skier per capita spending that is used in the USFS analysis. Volume II of the FEIS, in answer to comment 9.116, does however reveal the estimated total daily per capita spending for non-local (destination) skiers that was used in the FEIS estimation. This total was \$165.87 per destination skier day. The basis of this estimate was described in the FEIS as “Per capita spending estimates based on surveys of skiers in several western states including Colorado and Utah and data from *the Arizona Snowbowl Snow Users Surveys*.”<sup>13</sup>

The previous discussion pointed out that a fundamental flaw in the FEIS impact analysis involved including local (Coconino County) skier spending in the calculation of skier spending impacts. Subsequent documents supplied by Arizona Snowbowl and the USFS suggest that this fundamental flaw in the FEIS analysis was recognized and re-estimation of impacts using updated snow user survey data was attempted.<sup>14</sup> Both the new economic impact estimates and the underlying winter user survey of Snowbowl visitor spending have significant methodological flaws that lead to dramatic overstatements in the estimated impacts associated with both current non-local skier spending and predicted spending under the snowmaking alternative. These are discussed separately.

### 3.1 Errors in the 2008-2009 Winter Visitors Study

The 2008-2009 study sets as a goal to estimate total direct spending within Coconino County by skiers visiting Arizona Snowbowl who live outside this local area (more than 50 miles from

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<sup>13</sup> Footnote 129 FEIS. References to the FEIS cite the following as the sources for Snowbowl Snow User data. “Arizona Snowbowl. 1996-2003. Arizona Snowbowl Snow Users Surveys.”

<sup>14</sup> Bates Number ASB-0031231 entitled “Arizona Snowbowl Economic Impact, January 2010, shows the summary impact results and relies on Bates ASB-oo31658, “Winter Visitors Study: Flagstaff Convention and Visitors Bureau, 2008-2009”, by Gary Vallen Hospitality Consultants

Flagstaff). This is the appropriate value to use in estimating total local-area economic impacts within an IMPLAN input/output modeling framework.

The 2008-2009 study uses a stratified sampling method for contacting Arizona Snowbowl winter visitors and gathers a credible sample size (900) stratified over different time periods. Although the survey seems to have been carefully developed and administered, the author includes a paradoxical statement regarding the use of the data he has collected.

“[T]he findings summarized here *are likely not* representative of the entire population of attendees. Please be informed that Gary Vallen Hospitality Consultants; Dr. Gary Vallen; and/or other related organizations do not assume responsibility that these results are representative of the Arizona Snowbowl visitor population, nor can they be generalized to this population.” (emphasis in original) p. 4 Winter visitor Study 2008-2009.

Despite this warning, however, the report goes on to apply the survey results to the entire Arizona Snowbowl visitor population and develops total estimates of non-local visitor spending in the local economy (Economic Impact Summary section of report).

As outlined above, the two pieces of information needed to estimate total direct spending by non-local Snowbowl visitors in the local economy are 1) total number of non-local visitors, and 2) average spending per non-local visitor. The second parameter is one of the primary pieces of information generated by the winter visitor survey. The estimated average daily spending is \$116.37.<sup>15</sup> This number is somewhat lower than that used in the FEIS for the same population (\$165.87 per skier day). This estimate of \$116.37 per day is used in our following analysis.

The major error in the Economic Impact Summary of the 2008-2009 Winter Visitors Study is one of aggregation. Once the authors of the study had estimated average non-local daily spending, they needed only to multiply this number by the number of skier days by non-local visitors to Snowbowl in order to estimate total direct spending by non-local visitors.

Essentially, in aggregation it is important to ensure that both factors in the equation are in the same units. For example, average spending per day must be multiplied by total days, and average spending per visitor must be multiplied by total visitors. The report authors, however, did not heed this basic rule. Instead the 2008-2009 report converted their per-day spending estimates into “per-visitor/per-trip” estimates by basically multiplying spending per day by the average number of days spent in the Flagstaff area (estimated at 2.6 nights or 3 days). This estimate of spending per visitor trip was then multiplied by the estimated number of non-local

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<sup>15</sup> This includes \$34.91 per day for food and beverages, \$61.39 per day for ski area and all other miscellaneous spending, and \$20.07 per day (night) for hotel/motel lodging. Hotel/Motel lodging was estimated as average reported room rate (\$91.56), divided by average two persons per room, times 44% of non-local visitors who reported staying in a motel/hotel.

visitor skier days. The only way this method would be valid is in the case where all non-local skiers, no matter how long they stay in the area, only visit Arizona Snowbowl on one day of their visit. The Winter Visitor Study did not gather information on the number days spent at the ski area on non-local visitor trips. However, there is no support for this assumption in either the winter user survey results or the 2008-2009 report.

The 2008-2009 study Economic Impact Summary reports a total estimated direct spending in the local economy by non-local Snowbowl visitors of \$15.838 million. Using the appropriate method of aggregating total expenditures of multiplying per-day expenditures by skier days yields a corrected estimate of \$6.13 million. Therefore the 2008-2009 report overstates non-local spending by as much as 158% (Table 12).

**Table 12. Comparison of 2008-2009 Winter Visitor Study Estimated Direct Economic Impact and Corrected Estimates.**

<b>Spending Sector</b>	<b>2008-2009 Study</b>	<b>Corrected Estimate</b>	<b>% Overstatement in 2008-09 Study</b>
Lodging	\$ 2,757,403	\$ 1,060,539	160%
Food & Drink	\$ 4,742,105	\$ 1,838,011	158%
Other Spending	\$ 8,339,095	\$ 3,232,184	158%
<b>Total</b>	<b>\$ 15,838,603</b>	<b>\$ 6,130,734</b>	<b>158%</b>

While an argument might be made that non-local visitors do not visit Arizona Snowbowl on every day they are in the area, the results presented in the 2008-2009 report are clearly wrong in that they either rely on an error in aggregation or on the unsupportable assumption that no matter how long visitors stay in the area, they only visit Snowbowl on one day of their trip.

### **3.2 Errors in January 2010 Arizona Snowbowl Economic Impact**

While it is unclear who developed the one page January 2010 Arizona Snowbowl Economic Impact Estimates, the errors in the calculation of the impacts it presents are very clear. It should be noted that the impacts below are purported total impacts of the ski area post-expansion not incremental impacts as discussed previously.

- 1) The estimate uses the erroneously calculated total direct spending estimate of \$15,838,603 from the 2008-2009 Winter Visitor Study. As shown above, this estimate should be more appropriately calculated in the range of \$6.1 million.



- 2) The estimate does not include indirect and induced spending resulting from direct visitor spending. This total output expenditure multiplier is estimated by IMPLAN at 1.42. Therefore total (direct, indirect, and induced) visitor spending impacts should be \$8.7 million.
- 3) Multiplying this new impact times the (new) projected increase in visitation with snowmaking (local and non-local ski days are assumed to increase equally) lead to a multiplier over the 2008-2009 level (250,000 days / 135,000 days) of 1.85, for an estimated total visitor spending impact of \$16.095 million.
- 4) The estimate separately counts salaries and wages. These impacts are already included in the impact of visitor spending and should not be double counted.
- 5) The estimate employs a multiplier of “7” to expand the impact of wages and salaries in the local economy. This demonstrates a basic confusion between the concepts of “turnover” of dollars and the implied “multiplier.” Turnover is often used to describe the number of times a portion of each dollar is re-spent in the local economy. However, this portion of locally spent money decreases rapidly after the initial time it is spent. So while a portion of each dollar may be re-spent seven times, the actual multiplier associated with those dollars is much, much lower than “seven.” In fact, as the IMPLAN model calculates for the county economy, the total output multiplier associated with visitor spending is about 1.42.
- 6) The impact study reports a total estimated economic impact of non-local visitor spending and payroll with snowmaking of \$53.75 million. After correcting for the obvious errors in calculations and assumptions, this estimate should be in the range of \$16.1 million.
- 7) The use of the 2008-2009 Winter User Study data actually leads to lower total impact estimates associated with non-local Snowbowl visitor spending than the original estimate presented in the FEIS.

### **3.3 Relative Economic Importance of Arizona Snowbowl Expansion**

The FEIS took great pains to attempt to paint Arizona Snowbowl and its expansion plans as vital to the economic health of Flagstaff and Coconino County. While the FEIS analysis demonstrates a close relationship between annual snowfall or annual ski days of operation and the number of skiers visiting the ski area, The FEIS is completely unsuccessful in tying visitation to Arizona Snowbowl to the economy of Flagstaff or Coconino County in any statistically significant way. The analysis presented on page 3-119 of the FEIS showed no statistical relationship between number of annual skier days at Snowbowl and an index measuring winter tourism spending in the Flagstaff area.

As a point of comparison, the regression analysis shown in Table 13 began with the data in Table 3E-28 of the FEIS and added winter (December-March) recreational visitation for Grand Canyon NP visitors to the analysis. This estimated model includes both Arizona Snowbowl visitation and Grand Canyon NP Visitation for 12 winter seasons.

**Table 13. Linear Regression of FEIS Table 3E-28 Winter Tourism Activity Proxy Index on Annual Snowbowl Skier Days and December-March Grand Canyon NP Visitation: Dec 1990-March 2002**

<i>Regression Statistics</i>						
Multiple R	0.853					
<b>R Square</b>	<b>0.728</b>					
Adjusted R Square	0.668					
Standard Error	0.124788235					
Observations	12					
<i>ANOVA</i>						
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>	
Regression	2	0.375522	0.187761	12.05752	0.002844312	
Residual	9	0.140149	0.015572			
Total	11	0.515671				
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	0.866321175	0.358591	2.42	0.0389	0.055131946	1.6775104
<b>Arizona Snowbowl Ski-days</b>	<b>0.0000007</b>	<b>6.18E-07</b>	<b>1.16</b>	<b>0.2740</b>	-6.78222E-07	2.1183E-06
<b>Grand Canyon NP Visits</b>	<b>0.0000021</b>	<b>4.44E-07</b>	<b>4.81</b>	<b>0.0010</b>	0.000001	0.000003

Several important results are shown in Table 13. First, while the same model which included only Arizona Snowbowl visitation (Model 4) showed that ski visitation only explained about 2.9% of the variation in Flagstaff winter tourism economic activity over the period. In doing so, the model showed that snowbowl visitation was not even a statistically significant variable in explaining this variation in winter tourism spending. Table 6 however, shows that after adding Grand Canyon NP visitation as an explanatory variable fully 72.8% of winter tourism activity (as defined in the FEIS) is explained by the model. Further, while visitation to Arizona Snowbowl remains a non-significant explanatory variable, Visitation to Grand Canyon NP is highly significant (at the 99% level of confidence).

It should be noted that within this regression model an attraction that is 80 miles away (South Rim Grand Canyon) is highly explanatory of economic activity in Flagstaff while Arizona Snowbowl that sits only 7 miles from Flagstaff has no explanatory power at all.

In April 2005, the Hospitality Research and Resource Center at Northern Arizona University in Flagstaff completed a tourism study of the impacts of spending by Grand Canyon NP visitors to Coconino County AZ.<sup>16</sup> This study estimated the total Coconino County spending by Grand Canyon NP visitors at \$660.5 million annually (Table 14). By comparison, the corrected incremental impact on Coconino County spending associated with the proposed (Alternative B) Snowbowl expansion is in the range of \$6.8 million, or only 1% of the annual impact of spending by Grand Canyon NP visitors.

Table 14. Estimated Coconino County Spending by Grand Canyon NP Visitors: 2005 NAU Report. (Source: Table 72, p. 75 AHRRC/NAU 2005)

<b>Affected Industrial Sector</b>	<b>Regional Expenditures</b>	<b>Average Regional Expenditure Per Visitor</b>
Lodging (Hotels and Motels)	\$221,043,000	\$52
Food Services and Drinking Places	\$145,331,000	\$34
Retail/Merchandise Stores	\$98,779,000	\$23
Transportation, Gas Stations, and Auto Repair	\$89,062,000	\$21
Food and Beverage Stores	\$31,605,000	\$7
<b>Total for All Sectors</b>	<b>\$660,519,000</b>	<b>\$154</b>

The Grand Canyon regional economy is defined as Coconino County, AZ.

In order to verify the estimates in the 2005 NAU report on grand Canyon Visitor spending, total reported monthly gross sales for the Restaurant/Bar, Amusement, Retail, and Hotel/Motel Sectors of Coconino County were regressed on monthly visitation to Grand Canyon NP for the period from January 2005 through December 2010. The resulting model was highly explanatory with 71% of the variation in gross sales for these sectors being explained by changes in visitation to the Grand Canyon. Additionally, the model estimates that each Grand Canyon visitor accounted for \$115.84 in spending in the sectors examined for the county. The 95% confidence interval for this estimate was between \$98 and \$134 spent in the county per national park visitor. This estimate compares well with the average spending per visitor

<sup>16</sup> AHRRC/NAU 2005. "Grand Canyon National Park Northern Arizona Tourism Study." <http://www8.nau.edu/hrm/ahrrc/reports/Grand%20Canyon%20Comprehensive%20Final%20Report.pdf>

reported in the NAU study of \$154. It is important to note that the NAU estimate included spending in some small sectors not included in the Table 8 model results. Additionally, the NAU estimate was for spending “within 90 miles of the park” and thus may include some spending outside of Coconino County. Given the two areas where the NAU spending estimate may be expected to overstate the Table 8 estimate, the two per visitor spending estimates are remarkably similar.

**Table 15. Linear regression of Coconino County Gross Monthly Sales for Restaurant/Bar, Amusement, Retail, and Hotel/Motel Sectors with Total Monthly Grand Canyon NP recreational Visitation: January 2005-Dec 2010.**

<b>Coconino Hotel, Restaurant/Bar, Amusement and Retail Sales as a Function of Grand Canyon Visitation</b>							
<b>Monthly Data</b>							
<b>2005-2010</b>							
<i>Regression Statistics</i>							
Multiple R							
		0.84					
R Square							
		0.71					
Adjusted R Square							
		0.70					
Standard Error	12,396,704.55						
Observations		72.00					
<i>ANOVA</i>							
		<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>	
Regression		1	3.E+16	3.E+16	167.68	0.00	
Residual		70	1.E+16	2.E+14			
Total		71	4.E+16				
		<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept		92,265,234	3,574,573	25.81	0.000	85,135,972	99,394,495
<b>Grand Canyon Visitation</b>	<b>\$</b>	<b>115.84</b>	<b>8.95</b>	<b>12.95</b>	<b>0.000</b>	<b>\$ 98.00</b>	<b>\$ 133.69</b>

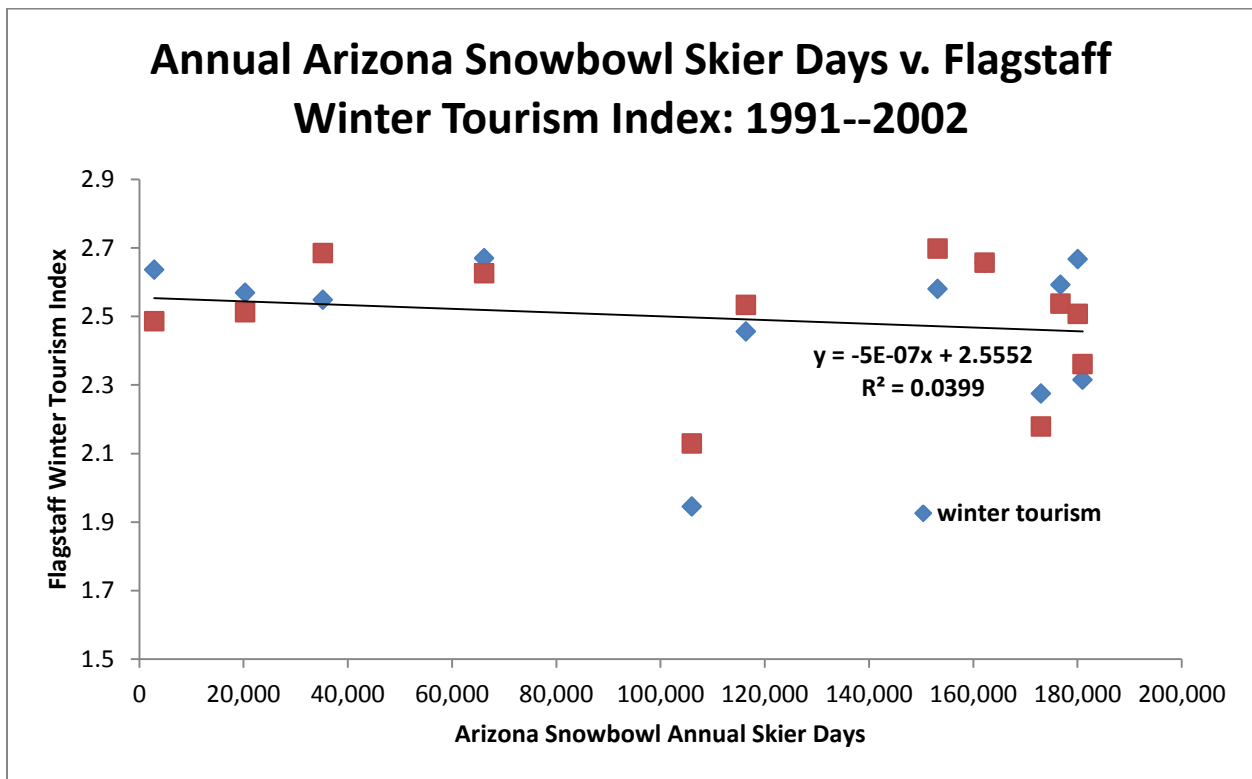
Table 16 puts the relative importance of the proposed Arizona Snowbowl expansion in the context of the overall size of the Coconino County economy and further compares it to the impact of Grand Canyon Visitor spending on the county economy. The comparison shows that spending by visitors to the Grand Canyon accounts for roughly 15% of total economic activity in the county and 8% of labor income. The proposed expansion and addition of snowmaking to Arizona Snowbowl has, by comparison, a very tiny and, as detailed above, uncertain impact on the county economy. The incremental impact of the Snowbowl expansion plans is estimated to account for less than two-tenths of one percent of county economic activity, and only nine one-hundredths of one percent of labor income in the county.

**Table 16. Comparisons of Total Coconino County Economic Activity (2009 IMPLAN) to Activity Attributable to Grand Canyon Visitor Spending (2005 NAU Estimate) and Incremental Activity Associated with Proposed Arizona Snowbowl Expansion (2003 FEIS Data).**

Economic Measure	Coconino County	Impact of Grand Canyon NP Visitors	Incremental Impact of Snowbowl Expansion
Gross Regional Product (Total Output)	4,683.6 <sup>1</sup> (100%) <sup>2</sup>	686.7 (14.7%)	7.5 (0.16%)
Labor Income (Includes both employee compensation and proprietor income)	3,154.3 (100%)	239.7 (7.6%)	2.8 (0.09%)

<sup>1</sup> Values are in millions of dollars.

<sup>2</sup> Percent of Coconino County total



**Figure 2. Annual Arizona Snowbowl Skier Days v. Flagstaff Winter Tourism Index: 1991—2002**

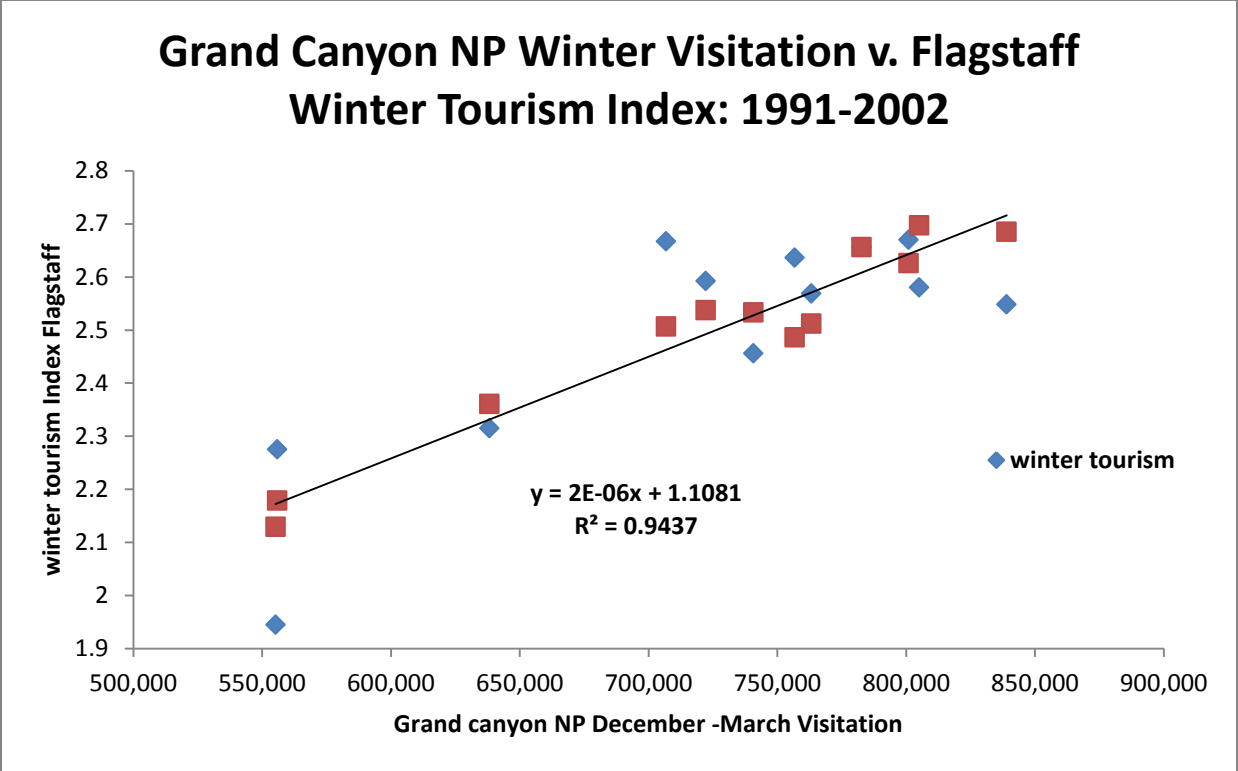


Figure 3. Grand Canyon NP Winter Visitation v. Flagstaff Winter Tourism Index: 1991-2002