

# **Economic Impact of the HHI Airport on Hilton Head Island**

**By**

**Robert A. Wallhaus, PhD**

**March 2012**

## Table of Contents

	<b>Pages</b>
<b>I. Summary</b>	<b>1</b>
<b>II. Introduction</b>	<b>3</b>
<b>III. Direct Expenditures</b>	
<b>III-1. Operating</b>	<b>5</b>
<b>III-2. Capital</b>	<b>6</b>
<b>IV. Ancillary Expenditures</b>	<b>7</b>
<b>V. Expenditures by Occupants of Flights</b>	<b>10</b>
<b>VI. Sensitivity Analyses</b>	<b>17</b>
<b>VII. Real Estate Impacts</b>	<b>19</b>
<b>VIII. Multiplier Effects</b>	<b>23</b>
<b>IX. Conclusions</b>	<b>24</b>
<b>Appendix</b>	<b>26</b>
<b>About the Author</b>	<b>27</b>

## I. Summary

Over six years ago a study of the economic impact of the Hilton Head airport (HXD) was commissioned by the SC Department of Commerce, Division of Aeronautics and carried out by Wilbur Smith and Associates (hereafter referred to as the WSA study).<sup>1</sup> This study found that the economic impact of HXD on Hilton Head Island was \$81.8M. Ever since this number has been used in numerous ways to justify and promote the expansion of the airport; including op ed. pieces, consultant reports, letters to the Editor of the Island Packet, speeches, etc. However, the economic impact reflected in the WSA study is greatly inflated.

This study provides a far more comprehensive analysis of the economic impact of the Hilton Head Airport that is specifically focused on the actual operations of the airport and of the characteristics of visitors coming to Hilton Head Island through HXD. It finds that the economic impact of the Hilton Head Airport on HHI is **\$26.2M**. That is, the WSA study overstates the actual economic impact of HXD by more than three times as much as the more accurate assessment provided in the study. The reasons for the large discrepancy between this 2006 study and the analyses contained in this report are discussed in the Section II. Introduction.

This study also addresses another erroneous belief that the airport has a major positive effect on the dollar amount of real estate sales on the Island. The thought (without any analytical examination) is that many potential buyers of "high value" property would be lost if they could not find a convenient place to land their private (or corporate) aircraft.

Increases and decreases in real estate property values due to the presence of the airport are analyzed in Section VII. of this report. Based upon these analyses the annual positive impact of the airport on real estate sales is estimated to be \$1,000,000; while the estimated annual reduction in sales values due to airport noise is \$418,000. Thus, the net annual increase in real estate agent commissions amounts to \$34,900; or, about \$36.80 per real estate agent per year. Further, even when properties are sold they do not constitute a significant impact on the HHI economy, because any net increases show up largely as increases in equity rather than increases in expenditures on HHI.

The analyses reflected in this report are consistent with other studies. For example, a study sponsored by the HHI/Bluffton Chamber of Commerce<sup>2</sup> estimates gross sales due

---

<sup>1</sup> "The Economic Impact of Aviation," South Carolina Division of Aeronautics, prepared by Wilbur Smith Associates, May 2006.

<sup>2</sup> "2008 HHI Gross Sales: Estimating Tourism's Contribution," *John Salazar* Lowcountry and Resort Islands Tourism Institute, University of South Carolina-Beaufort & *Bob Brookover* The Clemson International Institute for Tourism and Research Development, Clemson University.

to tourism for HHI at around \$890M and total gross sales for HHI at around \$1.28B. This report finds, and confirms other studies, that approximately 2.1% of island visitors come to the Island through the HXD. Thus, the economic impact of visitors arriving through HXD found in this report (the approximately \$19.3M reflected in expenditures before the application of multiplier effects) is consistent with the C of C study's estimate of gross sales by Island visitors; i.e., \$890 times .021 = \$18.7M. On the other hand, the economic impact found in the WSA study would require that almost 5% of all Island tourists come to HHI through HHI. That number has been shown to be inaccurate in other studies.<sup>3</sup>

---

<sup>3</sup> See, for example, a survey of Island visitors conducted by the Palmetto Hall Plantation Awareness Committee which found that approximately 2% of visitors arrived through HXD.

## II. Introduction

Economic impact studies are usually carried out to show the importance of an event, facility, or activity to the overall prosperity of a community. Typically, the economic impacts include the amounts spent on an event or activity which in turn generates business in the community; as well as the amounts spent by external sources, such as attendees from outside the community (e.g., island visitors who in turn spend money in the community).

In this study of the economic impact of the Hilton Head Island airport we include six different types of impacts: (1) amounts directly spent to operate the airport (i.e., the airport's staff and purchased services and supplies); (2) capital expenditures made for the maintenance and upgrade of facilities, primarily through FAA grants; (3) expenditures of ancillary functions necessitated by the airport (e.g., US Air baggage handling and counter personnel, taxi services, rental cars services, Transportation Safety Administration (TSA) personnel, Signature Flight Support, Inc. which provides services to general aviation (GA), and control tower personnel which are paid under a federal contract; (4) the expenditures of deplaning occupants of flights into HXD while on Hilton Head Island; (5) the *net* increase (some property values adjacent to the airport are adversely affected) in real estate values due to the presence of an airport on HHI, and consequent increases in real estate agent fees when a home is sold at a higher price; and (6) multiplier effects.

Multiplier effects measure secondary impacts of first order expenditures. For example, airport employees and island visitors eat at restaurants which in turn employ waitresses and chefs who then also spend some of what they earn on HHI. Theoretically, these second order expenditures have third order, or fourth order, or higher order effects. However, at each stage some money leaks "off island." In fact even at the first stage much of the next order expenditures do not accrue to HHI. For example, when a patron buys a meal at a restaurant it is likely that his raw steak is purchased off island (no cattle are raised on HHI). A more complete discussion of multipliers is provided in a separate section below.

As is the case in most economic impact studies much of the data regarding expenditures and participation patterns is not directly available, and consequently must be estimated based upon other studies, secondary sources, etc. In this study an attempt has been made to explain and justify the assumptions and estimates that are made. Furthermore, when it has been necessary to make assumptions and estimations these have been made in a direction that would lead to larger impacts rather than smaller impacts. The reason for this approach is to support the credibility of the study and avoid legitimate criticism from those who would like to overstate the importance of HXD to the island's economy.

Finally, we need to address the question of how this study of the economic impact of the HHI airport finds it to be so much less than that found in the SC Division of Aeronautics

sponsored study<sup>4</sup> (referred to as the WSA study) (i.e., \$26.2M versus 81.8M, or, less than a third as great). There are several reasons for this difference:

First, it is difficult to track the data used in the WSA study. For example, the study makes vague reference to a transient pilot survey administered by Fixed Based Operators (such as Signature Flight Support, Inc.) and a departing passenger survey administered by Wilbur Smith and Associates, but neither the surveys nor the data collected are further discussed. Results from such surveys would differ widely across different types of airports.

Yet, the WSA study uses statewide averages and parameters across very different types of airports (for example, expenditures and length of stay would be very different for a commercial service airport such as HXD and a general aviation airport such as Lady's Island).

The WSA study does not make a distinction between different types of passenger arrivals. Not accounting for this difference would yield very misleading results. For example, HHI residents using the airport would have no marginal economic impact on the Island. Tourists and business travelers have very different expenditure patterns and lengths of stay. People visiting and staying with friends or relatives would have still another economic impact. The WSA study assumes that 78% of commercial passengers deplaning at HXD are visitors or tourists (again the distinction is not made) versus business travelers and residents. This estimate is greatly inflated.

Finally, a multiplier of 1.63 is used in the WSA study. This may be an appropriate multiplier for the state of SC as a whole, but it is too large when applied to Hilton Head Island. Larger multipliers result when the area being analyzed is capable of producing a greater amount of business to business interaction (such as across the entire state of SC versus within the confines of HHI). For example, cattle are not available to produce steaks for HHI restaurants, but they would be available in some areas within the state of SC.

Real estate impacts have been analyzed in this study to dispute the information promulgated by those who believe (without any analytical examination) that these are far larger than is actually the case.

---

<sup>4</sup> Ibid. See footnote 1

### III. Economic Impact of Direct Expenditures

Expenditures necessary to run the HHI airport, both operating and capital expenditures have an economic impact on Hilton Head Island. These expenditures can be derived directly from the financial statements of the airport<sup>5</sup>.

#### III-1. Operating Expenses

**Table 1: Operating Expenses**

Operating Expenses*	Amounts**	% of Total	Notes
Airport Administration	\$415,800	28	4 employees
Firefighting Services	\$579,200	39	6 employees
Airport Maintenance	\$163,400	11	2 employees
Safety	\$326,700	22	3 deputies
Total	\$1,485,100		15 employees

\* Depreciation of \$546,100 was recorded as an operating expense (based on Government Accounting Standards Board guidelines), but is not included as an operating expense in the above table. Depreciation cannot be used to purchase goods and services.

\*\*Personnel expenses of \$955,300 are distributed across operating functions based upon FY2009 percentages provided by Beaufort County Employee Services. Expenses for purchased services and supplies are distributed proportionately to personnel expenses.

It is assumed that 75% all personal expenditures (some employees live off Island) and 75% of all purchased services and supplies expenditures were spent in the HHI economy<sup>6</sup>. Consequently, **the economic impact of the direct operating expenditures of the airport is estimated to be \$1,114,000** (\$1,485,100 \* .75).

<sup>5</sup> Beaufort County, SC Comprehensive Annual Financial Reports for FY 2010 Ended June 30, 2010.

<sup>6</sup> A refined estimate of the amounts spent on and off Island could be made by applying a national business activity data base and modeling system such as Minnesota Implan Group's Regional Input-Output Modeling System (IMPLAN) or Regional Dynamics (ReDyn) input-output modeling system. Unfortunately, the cost of acquiring ReDyn for use in this analysis was prohibitive.

### III-2. Capital Expenses

An estimate of the direct economic impact of capital expenditures at the HHI airport is based upon FAA grants. The average of FAA grants for 2008 (\$879,600), 2009 (\$2,474,800), and 2010 (\$1,243,300) is \$1,532,600. Once again, we estimate that 75% of capital expenditures were spent in the HHI economy<sup>7</sup>. **Therefore, the direct economic impact of capital expenditures at the airport is estimated to be \$1,149,400** ( $\$1,532,600 * .75$ ).

### Total Economic Impact of Direct Expenditures

**The total economic impact of direct expenditures at HHI airport is estimated to be \$2,263,400** (\$1,114,000, operating + \$1,149,400, capital).

---

<sup>7</sup> Ibid. See footnote 6

#### IV. Economic Impact of Ancillary Expenditures

Expenditures that have an economic impact are also incurred by ancillary operations associated with the HHI airport. These include:

1. Transportation Safety Administrative (TSA) personal
2. US Air counter agents
3. US Air baggage handlers
4. Rental car agents
5. Taxi drivers picking up passengers at the airport
6. GA expenditures including Signature (FBO) and “through the fence operations”
7. Control tower personnel, paid under federal contract

The numbers of individuals working in the above areas at the airport terminal (1-5 above) were observed on 10 occasions at different times of the day. In addition a conversation with the Signature Flight Support manager provided an estimate of personnel employed on the GA side of the airport (6 and 7 above).

Table 1 below provides the details of the observations made at the terminal at different times over 10 days.

Table 1: Observed Terminal Staffing Patterns (In Headcounts)

Date	9/26 1PM	9/27 11PM	10/19 3PM	10/20 10 AM	10/28 7PM	10/29 9 AM	10/30 1 PM	11/3 10 AM	11/7 7 AM	11/7 8 AM	11/7 9 AM	11/12 3 PM
Commercial												
Ticket Counter	3	3	3	3	2	2	2	3	1	1	2	2
Baggage	2	2	3	3	3	3	3	2			3	3
Other												
Car Rental												
Hertz	1	2	1	1	1		1	1			1	1
Avis		1	2	2	1	1	1	2		2	1	1
National	1	2				1		2			1	1
Budget	1		1			1	1	1				1
Dollar				2	1	1	1	2		2	2	1
TSA	5	5	6	6	5	5	5	6		1	6	4
Taxi	2	5	5	5	4	4	4	6		1	6	5

US Air has six flights leaving from HHI to Charlotte, NC on Monday; eight flights Tuesday through Friday; and seven flights on Saturday and Sunday. These flights are taking off and landing between 7 AM and 8 PM. Full staffing is required of basically all of the above functions (i.e., US Air, TSA, rental cars and taxis) for a period of 13 hours; partial staffing is required for an additional 2 hours for a total of 15 hours per day.

Two planes are required to meet these weekday schedules. Flight personnel (pilots and stewardesses) are based at the hub in Charlotte, NC. The first flight in the morning lands at HXD essentially empty. Consequently, it is assumed that US Air flight personnel have no economic impact on Hilton Head.

Observed headcounts (Table 1 above) need to be converted to Full Time Equivalents to account for full time schedules that are needed for approximately 13 hours per day as well as part time schedules that are needed for approximately 2 hours per day. One FTE is equivalent to one headcount position working annually 8 hours per day, five days per week. One headcount working for 13 hours equals 1.625 FTE (i.e. 13 hours/8 hours per day).

The following table first converts observed headcounts to FTE by multiplying the average observed headcounts in Table 1 by 1.625. Then, these FTE are adjusted to account for rental car and taxi operations as explained in the footnotes to Table 2. Finally, FTEs are converted to dollars by assuming an average gross annual salary of \$50,000 per FTE across all categories of terminal staffing.

Table 2: Ancillary Expenditures

<b>Function</b>	<b>Ave. Observed (1)</b>	<b>FTE= (1) X 1.625</b>	<b>Adjusted FTE (2)</b>	<b>Indirect Expenditures = (2) * \$50K/FTE</b>
Commercial				
Ticket Counter	3	4.875	4.875	\$243,750
Baggage	2	3.25	3.25	\$162,500
Car Rental				
Hertz	1	1.625		
Avis	2	3.25		
National	1	1.625		
Budget	1/2	.8125		
Dollar	2	3.25		
Total Rental Car		10.5625	5.28*	\$264,060
TSA	5	8.125	8.125	\$406,250
Taxi	4	6.5	4.875**	\$262,500

GA Operations***	17	14	14	\$700,000
Control Tower		3	3	150,000
<b>Totals</b>				<b>\$2,189,060</b>

\*Many car rentals have nothing to do with the presence of the airport; they are serving rental car needs across HHI. There are 60 to 75 rental cars parked across from the terminal at any given time, far more than needed to serve incoming passengers. Only once were more than 4 incoming passengers observed checking out a rental car. Consequently, total rental car FTE have reduced by 50% to more appropriately reflect the indirect expenses attributed to the airport.

\*\* In a significant number of instances the taxi driver did not pick up a fare. It is estimated that 75% of the potential expenditures did not occur (i.e.,  $6.5 * .75 = 4.875$ ).

\*\*\*GA and control tower operations were not observed; rather the FTE estimate is based on discussions with the Signature Flight Support station manager.

Again, it is assumed that 75% all personal expenditures (some employees live off Island) were spent in the HHI economy<sup>8</sup>. Consequently, **the economic impact of the ancillary operating expenditures of the airport is estimated to be \$1,641,800** ( $\$2,189,060 * .75$ ).

---

<sup>8</sup> Ibid. See footnote 6.

## V. Economic Impact of Occupants Arriving at HHI Airport (HXD)

### Introduction

Occupants of flights arriving at HXD, both Commercial and General Aviation (GA), are not a homogeneous group of people in terms of their impact on the HHI economy. The purpose of this analysis is to obtain a good estimate of economic impact for three different groups of occupants on arriving flights, defined (and, loosely labeled) as follows:

- Residents: Many people arriving at HXD have been away on business or visiting family and friends. These people return to their homes and have no greater economic impact than other HHI residents. There is no marginal contribution of HXD to the Island's economy for these occupants.
- Visitors: These occupants of HXD landings are not paying for lodging (they stay with family or friends). They do have a marginal economic impact in that they eat out (or buy groceries) and spend money on activities (e.g., golf) that would otherwise not be spent.
- Tourists: Tourists have the greatest economic impact as they do everything that visitors do, but also spend money on lodging (hotels or rentals) and eat out more frequently.

### HXD Flight Operations

The following steps describe the analyses and assumptions/estimates to determine the relative economic impact of these types of occupants, starting with the following table of 2010 HXD flight operations<sup>9</sup>.

Table 1: Flight Operations 2010

	Commercial	GA	Military	Total
Number of Operations	11,300	28,900	650	40,850
% of Operations	27.7	70.7	1.6	100
% of Operations – Military	28.1	71.9		100
% GA VFR		39.1		
% GA IFR		60.9		
Landings: Operations/2	5650	14,450	325	

<sup>9</sup> Paul Andres, Freedom of Information Act response, February 2011.

*Comments/Assumptions:*

These numbers differ slightly from those in the HXD Master Plan (they likely covered different periods of time).

Landings equal operations divided by two based upon the theory that what goes up must come down and vice versus (otherwise, over time, there would either be a large accumulation of aircraft at HXD, or no aircraft at all).

Commercial operations would likely be lower for the current period with the discontinuance of Delta flights.

Estimated GA Occupants

The following table describes occupants on different sizes of GA flights based upon a survey of pilots conducted by the Master Plan consultant (estimates and assumptions are provided in footnotes and comments below).

Table 2: Estimated Annual GA Occupants (Pilot Survey)

<b>Size of Aircraft</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>Totals</b>
Estimated Annual Landings (Survey)	245	180	650	1113	2188
Occupants per Flight (Survey)	7.3	4.1	5.2	2.5	4
Estimated Annual Occupants (Survey) <sup>10</sup>	1789	738	3,380	2,783	8,690
Percent of Estimated Annual Occupants	20%	9%	39%	32%	100%
Estimated Annual Occupants on All Flights <sup>11</sup>	11,930	4,920	22,530	18,550	57,930

<sup>10</sup> Based upon these survey data the average number of occupants per flight was used to estimate the annual occupants arriving on each size of aircraft (occupants per flight \* estimated annual landings). Note that this calculation assumes that the annual flights estimated by the surveyed pilots would average the same number of passengers on all of the annual estimated flights (i.e., if a surveyed flight had 5 passengers and the pilot estimated that he/she would land at HXD 30 times annually; then the estimated annual occupants on these flights would be 150).

<sup>11</sup> Occupants on all flights annually are estimated by dividing estimated annual occupants from the survey by .15 (the survey represents 15% of all annual landings shown in table 1; i.e., 2188/14,450).

*Comments/Assumptions:*

- (1) Table 2 is constructed from the pilot surveys conducted by Talbert and Bright as part of the Master Plan study. This survey was never analyzed by the consultants likely because they concluded the sample was too small. Indeed, it collected data on only .6% of all GA flights landing annually. That would scare away most any analyst contemplating using these results. However, the survey also asked the pilots “How many times annually do you land at HXD?” If one extends this estimate to get an annual number (the 2,188 in Table 2) this will account for 15% (2,188/14450 in Table 1) of all GA flights. These results can then provide useful insights.
- (2) The pilot survey data are sorted into 4 sizes of flights:
  - 4:** Larger aircraft. These aircraft are included in the list of “75% of the Fleet” in Table 3-1 of FAA Circular 150/5325-4B. In general, they consist of aircraft with a capacity >9 passengers and empty weight >12,000 lbs.
  - 3:** Twin jet aircraft that have a capacity of around 8 passengers and empty weight between 7,500 and 12,000 lbs. They constitute the remaining 25% of the fleet in Table 3-2 of FAA Circular 150/5325-4B.
  - 2:** Twin propeller aircraft with capacity of between 5 and 10 passengers and empty weight between 4,000 and 7,500 lbs.
  - 1:** Single propeller aircraft.

These flights could be regrouped into other categories. However, for the purpose of estimating economic impact the size of aircraft is not the critical variable, the number of occupants is the focus of the analysis.

Estimated Occupants Adjusted for Pilots

In most cases the pilots, particularly of smaller aircraft, would be essentially the same as other occupants in terms of their expenditure patterns (i.e., everyone on the flight would have the same purpose and would be traveling together). However, this would not be true on some of the larger flights. Also, flights of larger aircraft (i.e., category 4 aircraft as defined above) would have both a pilot and a co-pilot<sup>12</sup>. For purpose of analyzing economic impact the numbers of occupants in Table 2 above must be reduced to account for the fact that in some cases the pilot and co-pilot would not be traveling with the other occupants of the aircraft. This adjustment is made in Table 3 below.

Table 3: Estimated Annual GA Occupants Adjusted for Pilots

---

<sup>12</sup> FAA Regulation Part 135.99 states that a second in command is required if the aircraft has 10 or more seats excluding the pilots' seats.

<b>Size of Aircraft</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>Totals</b>
Estimated Annual Landings (Survey)	245	180	650	1113	2188
Occupants per Flight (Survey)	7.3	4.1	5.2	2.5	4
Estimated Annual Occupants (Survey)	1789	738	3,380	2,783	8,690
Percent of Estimated Annual Occupants	20%	9%	39%	32%	100%
Estimated Annual Occupants on All Flights	11,930	4,920	22,530	18,550	57,930
Estimated Annual Occupants on All Flights Adjusted for Pilots	10,330	4,920	22,530	18,550	56,330

*Comments/Assumptions:*

It is assumed that on 50% of the 1,600 (245 based upon the pilot survey)/.15 (15% of the total annual landings) category 4 flights, the pilot and co-pilot would not be traveling with the other occupants. So, the number of residents, visitors, and tourists in Table 2 would be proportionately reduced by 1600 occupants (i.e., 50% of 1,600 landings \* 2 pilots). It is assumed that all pilots on Category 3, 2, and 1 flights would be traveling with the other occupants (i.e., would have the same expenditure patterns). This adjustment to Table 2 is shown in Table 3 above.

Estimated GA and Commercial Occupants

Table 4 summarizes the number of occupants arriving at HXD on both commercial and GA aircraft.

Table 4: Estimated Annual GA and Commercial Occupants

	<b>Commercial</b>	<b>GA</b>	<b>Total</b>
Estimated Annual Occupants	66,000 <sup>13</sup>	58,000	124,000
Occupants Adjusted for Pilots	66,000	56,000 <sup>14</sup>	122,000

<sup>13</sup> Estimates of this number vary across different sources. Generally, they fall between 60,000 and 70,000. With Delta's departure that will likely turn out to be high.

<sup>14</sup> This is the estimate from Table 3 above, rounded.

## Purposes of Travelers on Flights landing at HXD

The next step is to examine the purposes of travelers into HXD. This is an important step in that arrivals with different purposes exhibit different expenditure patterns.

The pilot survey asked about the purpose of the flight (Why are you traveling to HHI?). The responses are summarized in the following table.

Table 5: Purpose of the Trip for Occupants of GA Flights (From the Pilot Survey)

<b>Purpose of Travel</b>	<b>% GA</b>	<b>GA Occupants</b>	<b>% Commercial</b>	<b>Commercial Occupants</b>	<b>Total Occupants</b>
Business Occupants	61%	34,160	61%	40,260	74,420
Personal Occupants	25%	14,000	25%	16,500	30,500
Vacation Occupants	14%	7,840	14%	9,240	17,080
Total Occupants		56,000		66,000	122,000

### *Comments/Assumptions:*

The pilot surveys reported that 13.7% of the responses concerning purpose of travel was “multiple purpose;” that is, some combination of business, personal and vacation purposes. Most of these respondents have likely come to HHI for a business meeting and stayed on to enjoy the beach or golf, etc. Some may have spent a few days with friends while vacationing on HHI. Since we have no means of accurately determining the expenditure patterns of these multi-response travelers we have arbitrarily assigned one-third to each of the other three categories (i.e., business, personal, and vacation). This distribution is reflected in the above table.

While the idea of traveling on business or vacation is rather straight forward, the notion of personal travel could mean a variety of things. It could include people who are visiting family or friends. It could also include people coming to HHI for celebrations, to attend events, or help with family medical or retirement issues.

We have no basis for directly determining the purpose of travel for those arriving on commercial flights. So, we’ve made the *big assumption* in Table 5 that commercial travelers reflect the same purposes as GA travelers (reflected as the same percentages for both GA and Commercial in the above table).

It is possible to check the consistency of these numbers in relation to Chamber of Commerce historical data regarding HHI visitors. Based upon C of C data, in 2009 and 2010 slightly more than 2,200,000 people visited the Island. Table 6 above estimates that 47,600 occupants of flights arriving at HXD visited the Island for personal or vacation purposes. This is approximately 2.1 % of 2,200,000 (i.e., 47,600/2,200,000) visitors to HHI. This is clearly in the range of the percent of visitors coming to HHI through HXD found in other studies (i.e., 2% to

3%). So, even though we have backed into these numbers in a different way and based upon different data/assumptions, the results are consistent.

Types of Occupants by Purpose

Next we estimate the number of flight occupants of the types defined at the beginning of this section (i.e., residents, visitor, and tourists) who are traveling with the purposes identified in Table 5 above.

Table 6: Types of Occupants by Purpose

	Business	Personal	Vacation	Total
Tourists				
Percent	5%	20%	75%	
Number	3,720	6,100	12,810	22,630
Visitors				
Percent	5%	80%	25%	
Number	3,720	24,400	4,270	32,390
Residents				
Percent	90%	0%	0%	
Number	66,980			66,980
Percent	100	100	100	
Total	74,420	30,500	17,080	122,000

*Comments/Assumptions:*

Once again, there is no data set which can be used to derive the percentages reflected in Table 6. However, the following is the rationale supporting the estimates shown. Note that the distinction between a tourist (those who stay in lodging provided at hotels, rental units, condos, etc.) and a visitor (who would be staying with family and friends) is made to reflect the different spending patterns of these two different groups of people.

Vacation: The majority of these travelers, 75%, are estimated to be tourists; some, 25%, would be staying with family or friends while on vacation.

Business Almost all people traveling in/out of HXD on business, 90%, would be residents; although a few could be staying in overnight lodging, 5%, or with family or friends, 5%. For example, the C of C visitor profile study<sup>15</sup> includes very few respondents who are traveling for business purposes (only 1.8% responded that they were attending a convention). Note that we have already distributed 1/3 of the 13.7% of occupants with multiple purposes to the business category.

<sup>15</sup> 2009 Visitor Profile, Hilton Head Island-Bluffton Chamber of Commerce, February 2010.

Personal: As noted above this category could encompass a wide range of different reasons for travel to HHI. Since the preponderance of these reasons would seem to involve family or friends, we assume that the majority (80%) would be staying with family or friends (i.e., are defined as visitors).

Note that residents *do not come to* the Island to be on vacation (they *may leave* the Island to be on vacation). Likewise, they may leave the Island for personal reasons, but do not come to the Island for personal reasons. This is the meaning of the zero percents in the residents row of Table 6.

An important refinement that could be made to this study is to obtain better estimates of the percentages of types of travelers (tourists, visitors, and residents) that are assigned to different purposes of travel (business, personal, and vacation) in table 6 above. This could be done through personal surveys of arriving and departing passengers on both sides of the airport (commercial and general aviation) across different times of the year.

Calculation of Economic Impact

The final step is to determine the total expenditures across all categories of arrivals into HXD. Once again, the C of C Visitor Profile Study provides the basis for analyzing length of stay and expenditure patterns of Island visitors and tourists.

Table 7: Expenditures of Occupants on Flights to HXD

	Business	Personal	Vacation	Totals
(1) Number of Tourists	3,270	6,100	12,810	22,630
(2) Expenditures per Person/Day	\$95	\$95	\$95	
(3) Ave. Number of Days	5.5	5.5	5.5	
<b>Expenditures by Tourist Occupants [(1)*(2)*(3)]</b>	<b>\$1,708,575</b>	<b>\$3,187,250</b>	<b>\$6,693,225</b>	<b>\$11,589,050</b>
(4) Number of Visitors	3,270	24,400	4,270	32,390
(5) Expenditures per Person/Day	\$53	\$53	\$53	
(6) Ave. Number of Days	4.5	4.5	4.5	
<b>Expenditures by Visitor Occupants [(4)*(5)*(6)]</b>	<b>\$887,220</b>	<b>\$5,819,400</b>	<b>\$1,244,705</b>	<b>\$7,725,015</b>
(7) Number of Residents	69,980	0	0	69,980
(8) Expenditures per Person/Day	0	0	0	
(9) Ave. Number of Days	0	0	0	
<b>Expenditures by Tourist Occupants [(7)*(8)*(9)]</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>

### *Comments/Assumptions:*

The numbers of tourists (row 1), visitors (row 4), and residents (row 7) in the above table are those shown in the previous Table 6.

Expenditures per day in the above table were derived from the C of C study which found that a group coming to HHI averaged 4.4 people and spent \$419/day over 6.5 days; or \$95 per person per day. This was the expenditure amount attributed to a “tourist” in Table 7.

It is assumed that visitors would not have lodging expenditures estimated to be \$161/day in the C of C profile study for a group of 4.4 people. Further, visitors would have slightly lower meal expenditures than tourists since they do not “eat out” as often; resulting in an estimated additional reduction of \$25/day. Therefore, it is estimated that the average group of 4.4 visitors (which would spend \$419-\$161-\$25 = \$233/day) or \$53 per person/day. This was the expenditure amount attributed to a “visitor” in Table 7.

The Wilbur Smith Associates (WSA) study uses an average length of stay for visitors flying into SC airports (of all types) on GA flights of 2.2 days, while those on commercial flights averaged 5.2 days. On the other hand, the C of C reported that the average length of stay of visitors was 6.5 days. We have reconciled these different estimates by using an average length of stay of 4.5 days for visitors and 5.5 days for tourists in Table 7. The rationale supporting these conclusions and analyses is developed in the Appendix.

### Summary

**The total annual economic impact of occupants flying into the Hilton Head Island airport is estimated to be \$19,300,000.** In the analyses leading to this result we have consistently made assumptions and estimates that would tend to overstate, rather than understate, the economic impact of occupants on flights to HHI.

## **VI. Sensitivity Analyses**

In a number of instances assumptions or estimates have been made which could significantly affect the overall economic impact of occupant spending on HHI. It is useful to look at how results would differ under different assumptions, called sensitivity analyses. The three areas where different assumptions could make a significant difference are: (1) length of stay; (2) distribution of occupants into visitor and tourist categories; and (3) estimated per day expenditures by visitors. These are analyzed as follows:

(1) Length of stay The average length of stay used in the above analyses is 4.5 days for visitors and 5.5 days for tourists. Had 5.0 and 6.0 days been used the economic impact would have been \$21.2M. This would represent an increase of 9% over the economic impact estimated in Table 7 above (i.e., \$19.3M).

(2) Distribution of occupants by purpose In Table 6, 25% of those with a purpose of “vacation” have been assigned to the visitors category and 75% to the tourist category. Had the assignment been 15% to the visitors category and 85% to the tourist category the economic impact would have been \$19.8M instead of \$19.3M; which is a 3% increase.

Similarly, if distribution of those with a “personal” purpose was 30% tourists and 70% visitors, the economic impact would have been \$20.2M which is a 5% increase.”

(3) Expenditures per day by visitors. The C of C profile study did not provide separate estimates of daily expenditures for visitors (\$53 per day) and tourists (\$95 per day). A lower estimate was used for visitors by reducing lodging costs, which is justified by the definition of visitor (i.e., staying with family or friends). However, a further assumption was made that visitors would have reduced meal costs (arbitrarily set at \$7 less per day). The C of C profile study does not provide a basis for making this or any such reduction. Had this reduction not been made (i.e., visitor daily cost estimated to be \$60, the economic impact would have been \$20.3 instead of \$19.3, which is an increase of 5%.

(4) Had all of the above assumption been made in the direction of increasing the economic impact of flight occupants on flights to HHI, the total impact would have been \$21.6M, or an increase of \$2.3M (i.e., 11%).

In summary, there is no reasonable set of assumptions that could bring the estimated impact of the HHI airport to within 1/3 of the economic impact estimated in the WSA study.

## VII. Impact on Real Estate Values

The availability of the HHI airport undoubtedly has both positive and negative impacts on real estate sales in the following ways:

- The presence of an airport on HHI can attract new home owners to the Island who own or make extensive use of private aircraft, and are willing to pay a higher premium for real estate to have easy access to an airport.
- Homes located very near the airport become less desirable because of the noise of aircraft take offs and landings. Consequently, real estate values of homes adjacent to the airport are adversely affected.
- Real estate agents make a larger commission on homes sold at a higher price (or, conversely, lose commissions on homes sold at lower prices).

### Positive Impact on Home Values

It is assumed that the segment of the real estate market that would be positively affected by the presence of HXD would be the “high income” market (i.e., upper tier, single family homes, valued at \$1,000,000 and above). These upper tier homes are cited by real estate agents in their anecdotal references to the importance of the airport in encouraging real estate sales.

The following are recent listing and sales information for homes valued at \$1,000,000 or more on Hilton Head Island<sup>16</sup>:

- As of October 31, 2011 there were 242 homes listed for sale above \$1,000,000.
- 40 homes over \$1,000,000 have sold since May 2011 (i.e., over a 6 month period).
- The median selling price over this 6 month period was \$1,300,000; the highest value of a home sold was \$6,500,000; and 7 homes of the 40 were sold for over \$2,000,000 (30 for less than \$2,000,000).

The following assumptions are made to estimate the positive impact of the airport related to the HHI real estate market.

- The impact of the airport is primarily on homes selling above \$1,000,000.
- Approximately, 80 homes have been sold annually in recent years.
- The median selling price for 2011 was \$1,300,000; the average selling price was less. The average selling price of homes selling for more than \$1,000,000 is estimated to be \$1,250,000.
- It is assumed that 10% of high valued homes would not have been sold if the airport was not located on HHI; and further, that those who buy such homes because of the convenience of the airport are willing to pay a 10% premium for them.

Based upon these assumptions **the annual positive impact of the airport on real estate sales is estimated to be \$1,000,000**. The following calculations are used to derive this estimate.

---

<sup>16</sup> Data can be found at many realtor web sites such as [www.collinsgrouprealty.com](http://www.collinsgrouprealty.com) and [www.trulia.com/realestate/hiltonheadisland](http://www.trulia.com/realestate/hiltonheadisland)

- \$125,000 per home is the increase of the average value of a home sold due to the presence of the airport = 10%\*\$1,250,000, assuming that everyone who buys a high valued home is willing to pay a premium to own a home convenient to the airport.
- \$10,000,000 is the total increase in the value of homes sold annually = \$125,000 per home \* 80 homes sold per year; again assuming that everyone who buys a high valued home is willing to pay a premium to own a home convenient to the airport.
- \$1,000,000 is the estimated annual impact on real estate sales due to the presence of an airport on HHI = 10% \* (proportion of sales influenced by the presence of an airport on HHI) \* \$10,000,000 (total potentially influenced by the presence of the airport).

### Negative Impact on Home Values

There is no question that aircraft noise can have an adverse affect on the value of homes in the immediate proximity of an airport. However, how this affects real estate values is difficult to measure. First, homes that are very close to the airport will be more affected than those even a slightly greater distance away. Second, the location of the homes in relation to the ends of the runway can make a difference. Third, the different densities of sound barriers at different locations in a community will make a difference. In summary, there are many factors involved in estimating the impacts of the airport on adjacent communities. Such factors undoubtedly account for the significant differences in affects on real estate values due to airport noise that have been found in various studies. For example:

- A 1994 Booz-Allen & Hamilton study<sup>17</sup> found that the effect of noise on home prices was highest in moderately priced and expensive neighborhoods. In two paired neighborhoods north of Los Angeles International Airport the study found “an average of **18.6 percent** higher property value in the quieter of the two neighborhoods, or 1.33 percent per dB of additional quiet.”
- A 1996 study mandated by the Washington state legislature<sup>18</sup> found that it would cost five nearby cities \$500M in property values. An analysis of moderately expensive, single family homes in the immediate vicinity of the airport found that “they would sell for **10.1 percent** more if they were located elsewhere.” The Washington study also concluded that property value increases by about 3.4% for every quarter of a mile that it is further away from the airport.
- Randal Bell compared 190 commercial properties over six months in the Los Angeles area and found a diminution in value due to airport proximity averaging **7.4 percent**.<sup>19</sup>

So, the estimates of airport noise effects on real estate values varies widely due in large part to the variety of conditions affecting these impacts.

---

<sup>17</sup> “The Effect of Airport Noise on Housing Values, Booz-Allen & Hamilton, 1994 for the Federal Aviation Administration.

<sup>18</sup> Study of the proposed expansion of the Seattle-Tacoma Airport.

<sup>19</sup> Randall Bell, 1997, analyses of real estate appraisals around Los Angeles airports.

Another complicating issue related to HXD and surrounding communities is that the airport was in place before most residences were built or purchased. The airport should have no marginal impact on these residences; that is, any negative effects on the real estate values should have already been realized when the property was built or purchased. *However, plans to extend airport runways have had a negative impact on all property values.*

The following assumptions are made to estimate the negative impact of the airport related to the HHI real estate market.

- The impact of the airport is primarily on homes selling in Palmetto Hall (PHP) and Port Royal (PRP) Plantations. It is recognized that other communities in the vicinity of the airport (e.g., Baygall, Indigo Run) would also be adversely affected, but these have been excluded simply to not overly complicate some very broad assumptions and estimates.
- Currently (July 2011), 23 homes are on the market in PHP with an average estimated selling price of \$600K; and 28 are on the market in PRP with an average estimated selling price of \$1M.
- It is assumed that 10% of these homes will be sold per year with a total value of:  
    In PHP of  $\$600K \times 2.3 = \$1,380K$   
    In PRP of  $\$1,000K \times 2.8 = \$2,800K$   
    Or, total annual sales of slightly more than \$4,180,000 in these two plantations.
- It is assumed that the sales values in PHP and PRP have been reduced by 10% (an estimate in the middle of the range of studies cited above) as a result of a perceived increase in aircraft noise resulting from impending runway expansions.

Thus, **the estimated annual reduction in sales values due to airport noise is \$418,000** ( $\$4,180,000 \times 10\%$ ).

**In summary, the potential positive impact on real estate sales due to the presence of an airport on HHI (i.e., \$1,000,000) is offset by a negative impact on communities adjacent to the airport due to aircraft noise associated with impending runway expansion of \$418,000. The net impact of the airport on sales of property is therefore \$582,000.**

#### Net Impact on Real Estate Agent Commissions<sup>20</sup>

The **economic impact of the increase in real estate agent commissions due to the increased value of homes sold is \$34,900** =  $\$582,000$  (net increase in value of homes sold) \* 6% (real estate commission).

The **annual increase in commission amounts to \$36.76 per real estate agent on HHI** =  $\$34,900$  (total increase in commissions) / 950 (the number of real estate agents on HHI).

#### In Summary

**In summary, the total impact of the HHI airport on real estate sales and agent commissions is around \$617,000** (approximately  $\$582,000 + \$34,900$ ).

While the impact of the airport on real estate values is important, it is of a different character than the other economic impacts analyzed (i.e., direct and indirect expenditures and

---

<sup>20</sup> See the MLS web site [www.hiltonheadislandmls.com](http://www.hiltonheadislandmls.com)

expenditures by occupants of flights). These later impacts constitute expenditures which show up immediately in the HHI economy. On the other hand increases or decreases in real estate values do not directly show up in the HHI economy, often even when they are sold. That is, increases or decrease in "home equity" are just that, increases or decreases in equity. Often this net equity may be applied to the purchase of another home. However, many such purchases would not even be made on HHI. There are a couple of instances where home purchases would show up as expenditures in the Hilton Head economy. First, if any gain in equity were used to purchase goods or services; and second, net increases in real estate commissions would to a great extent be expended in the Hilton Head economy. These later impacts on the HHI economy are, however so small (i.e., estimated to be around \$35,000) that they can essentially be ignored. Consequently, real estate impacts are not included in the overall tabulation of the economic impacts of HXD on the Island economy.

## VIII. Multiplier Effects

Direct, ancillary and visitor/tourist expenditures associated with HXD represent increases in the economic impact of the Hilton Head Island airport. However, secondary impacts also occur as these expenditures leverage additional expenditures. For example, a baggage handler whose salary is paid by US Air uses part of his pay check to buy groceries. Then, the grocer pays his employees and other expenses such as the purchase of the meat and vegetables he sells. Of course, employees spend parts of their salaries "off island" and meat and vegetables are also purchased "off island." The multiplier attempts to trace this stream of expenditures until second, third, and higher order expenditures eventually totally leak out of the economy being analyzed (in this case totally leaks out of HHI).

Larger multipliers generally occur when the area being modeled is capable of providing greater business to business interactions. For example, when HHI hotels need to replace dinner ware, they most likely would make such purchases "off island," whereas Chicago hotels are more likely to make such purchases in Chicago. Consequently, a study of an economic impact on Chicago (like O'Hare International Airport) would employ a larger multiplier than would a study of the economic impact of HXD on HHI.

To estimate multipliers a national data base/model is used such as the Minnesota IMPLAN Group's Regional Input-Output Modeling System or Regional Dynamics (ReDyn). The multiplier used in a recent study of the economic impact of the Heritage Golf Tournament on Hilton Head Island was 1.13 calculated by ReDyn<sup>21</sup>.

Neither the IMPLAN nor ReDyn models have been explicitly applied to this study of the economic impact of HXD on the HHI economy at this point. However, the 1.13 multiplier used in the Economic Impact and Marketing Study of the 2010 Verizon Heritage Golf Tournament should be a reliable multiplier to use in this study of the economic impact of the HHI airport; particularly since the same economy is being studied.

Certainly, the multiplier of 1.63 used in the WSA study is too large. This is a multiplier applied to the entire state of South Carolina which would not be appropriate to use for HHI. In other words when taxi drivers serving HXD need to purchase new tires (using some of the revenue they receive from fares) those tires would not have been manufactured on HHI, but they could well have been manufactured in the state of SC.

In summary, **a multiplier of 1.13 seems to be appropriately used in this study of the economic impact of the HXD on HHI.**

---

<sup>21</sup> Economic Impact and Marketing Study of the 2010 Verizon Heritage Golf Tournament Clemson University's International Institute for Tourism Research and Development and USC Beaufort's Department of Hospitality Management.

## Conclusions

In conclusion the HHI airport does have an economic impact on Hilton Head Island. But, as an effort has been made over the past several years to gain support for the expansion of the airport its economic impact has been greatly exaggerated.

Likewise the importance of the airport for real estate sales and the value of property sold have also been overstated.

It is unfortunate that these misconceptions have been so frequently misstated in various contexts, that they have influenced some decision makers to make poor judgments about the future of the airport.

To summarize, the total economic impact of the HHI Airport on Hilton Head Island is approximately \$26.2M. The following Table shows the various kinds of impacts making up that total.

**Table 8: Summary of the Economic Impacts of the HHI Airport on HHI**

Type of Impact	\$	Notes
Direct Expenditures		Expenditures for airport operations from Beaufort County financial statements
Operating	1,114,000	
Capital	1,149,400	
Ancillary Expenditures	1,641,800	Expenditures by US Air, rental cars, TSA, taxis, control tower, general aviation
Expenditures by Occupants	19,314,100	Expenditures of Island visitors arriving at HXD
<b>TOTAL</b>	<b>\$23,219,300</b>	
Multiplier Effects	X1.13	Additional cycles of expenditures resulting from the initial expenditures listed above.
<b>TOTAL</b>	<b>\$26,237,800</b>	

As with all economic impact studies, certain assumptions and estimates have been made as a result of lack of data and the use of secondary sources of data (i.e., data which were not collected unrelated to this economic impact study). The following are the most critical assumptions that have been made in terms of their likely influence on results. These are also the areas where further data collection would have the greatest utility in refining the estimates of economic impact:

Lengths of Stay: These have not been directly measured, but were derived from other studies.

Differentiation or Types of Occupants: Different travelers arriving/departing HXD (e.g., residents, visitors, tourists) exhibit different kinds of economic behavior. Again, the numbers of these different types of occupants have not been directly measured, but were derived from other studies.

Expenditure Patterns of Occupants: Once again, there was no available data upon which to base the expenditure patterns of different types of travelers arriving/departing HXD.

The best way to obtain better estimates of the above parameters is to survey passengers arriving and/or departing HXD (on both the commercial and general aviation sides of the airport, at different times of the year).

Multipliers: The multiplier used in this analysis was that used to estimate the economic impact of the Heritage Golf Tournament. While this is undoubtedly a good estimate, it would be better to directly apply the Regional Dynamics (ReDyn) input-output data base and modeling system to the economic impact of HXD on HHI. This is just a matter of purchasing and applying the ReDyn package.

## Appendix: Length of Stay Analyses

The Wilbur Smith Associates (WSA) study of the “Economic Impact of Aviation” in SC (May 2006) uses a **length of stay** for visitors flying into SC airports as **2.2 days** for General Aviation arrivals and **5.2 days** for commercial arrivals. These number were based upon a “Transient Pilot Survey” (no other information about the survey procedures is provided), information from Fixed Base Operators (FBOs), etc.

On the other hand, the HHI-Bluffton Chamber of Commerce Visitor Profile Study reported that the average **length of stay** of visitors *who stayed in overnight accommodations was 6.5 days*. If visitors staying with their families or friends are included this average would be smaller, like between **5 and 5.5 days**. The C of C sample of approximately 1,400 visitors was drawn from the approximately 33,000 people who made inquiries of the Chamber over a two year period.

A study of the economic impact of the Heritage golf tournament estimated the **length of stay** to be **between 5 and 8 days** depending upon the number of days of the tournament that respondents attended<sup>22</sup>.

The WSA study significantly underestimates the length of stay for commercial service airports which serve a large number of pleasure visitors like HXD and Myrtle Beach. Note that the WSA study is an average across all SC airports including GA only (like Lady’s Island) as well as six commercial service airports. The length of stay at GA airports, like Lady’s Island, is undoubtedly lower than 2.2 days. A length of stay of 2.2 days may be appropriate for commercial service airports serving a large proportion of business/government travelers like Columbia or Spartanburg-Greenville. But, a 2.2 day length of stay would certainly be too low for visitors coming to HHI (and, Myrtle Beach).

On the other hand, the C of C profile and Heritage study would overstate the length of stay for people landing at HXD. These studies contain very few business and resident travelers (they generally don’t make inquiries of the Chamber). Business/resident travelers would have shorter lengths of stay than pleasure travelers (many would not even stay overnight). Also, the C of C study would be weighted toward first time visitors as opposed to multi-occasion visitors (like those on annual golf outings). The C of C study included people who used all forms of transportation to come to HHI (77% used a family auto). The heavy orientation toward first time pleasure travelers would result in a length of stay that is larger than the average for all types of purposes that people have for flying into HXD. Furthermore, visitors staying in overnight accommodations would likely have longer lengths of stay than those staying with family and friends.

We estimate the **length of stay** for visitors as **4.5 days**, and for tourists arriving at HXD to be **5.5 days**. This estimate is between estimates used in the WSA, the C of C, and Heritage studies, but somewhat lower than the C of C and Heritage studies to reflect the fact that 61% of the HXD occupants (both GA and commercial) have business purposes.

---

<sup>22</sup>“Economic Impact and Marketing Study of the 2010 Verizon Heritage Golf Tournament” conducted by Clemson University’s International Institute for Tourism Research and Development and USC Beaufort’s Department of Hospitality Management.

## About the Author—An Abbreviated Resume

Dr. Wallhaus received a Ph.D. In Industrial Engineering with an emphasis in Operations Research from the University of Illinois in 1967, and served on the faculty of the University's Department of Mechanical and Industrial Engineering.

From 1978 through 1995 Dr. Wallhaus worked for the Illinois Board of Higher of Education, as Executive Deputy Director for Academic and Health Affairs. In this role he was responsible for review and approval of academic programs, supervision of a staff of professionals in carrying out analytical studies and formulating policy related to the long range development of higher education in Illinois, and making budget recommendations to the Governor and legislature.

Prior to joining the Illinois Board of Higher Education, Dr. Wallhaus was a Systems Engineer for IBM. In the 1970s he was Deputy Director for Research and Development at the National Center for Higher Education Management Systems (NCHEMS), an organization devoted to developing analytical approaches to planning and policy formulation in higher education.

Following his retirement from the Illinois Board of Higher Education Dr. Wallhaus worked part time in the Office of the Chancellor at the University of Illinois at Chicago, as well as serving as a Visiting Professor in the Ph.D. in Public Policy program. Dr. Wallhaus also served as a consultant to state systems of higher education, the National Center for Educational Statistics, and individual colleges and universities.

Dr. Wallhaus has taught courses in Operations Research and in Higher Education as a Visiting Professor at the University of Colorado and the University of Michigan. He has served on numerous national advisory panels, and has provided leadership in professional organizations, serving a term as President of the national Association for Institutional Research.