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**THE IMPACT OF VACATION
RENTAL UNITS IN HAWAI'I, 2016**

**Prepared for
Research Division, Hawai'i Tourism Authority
Hawai'i Convention Center
1801 Kalākaua Avenue, Honolulu, Hawai'i 96815**

SMS Affiliations and Associations:

Experian
International Survey Research
Solutions Pacific, LLC
SMS Consulting, LLC
3i Marketing & Communications

**Prepared by SMS Research & Marketing Services, Inc.
November, 2016**



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Mr. Daniel K. Nahoopii
Director of Tourism Research
Hawai'i Tourism Authority
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1801 Kalākaua Avenue
Honolulu, Hawai'i 96815

Dear Mr. Nahoopii:

It is with pleasure that SMS Research presents this report of the findings of the Housing and Vacation Rental Units Study, 2016. We believe the results will be an important tool to be used by those who will plan for and develop tourism management and new housing opportunities for Hawai'i.

It has been a pleasure to serve you during the course of this project, and we look forward to working with you in the future.

Sincerely,

A handwritten signature in black ink, appearing to read 'James E. Dannemiller', written in a cursive style.

James E. Dannemiller
Executive Vice President

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I. INTRODUCTION

Interest in the vacation rental phenomenon has been growing in Hawai'i at least since 2010. I was around that time that vacationers seeking and authentic experience in the communities they visited began to seek out homes and apartments in residential communities. The idea wasn't brand new. We have always had bed and breakfast units in our neighborhoods. But by 2010, visitors were seeking many more units than in the past, and local residents were discovering the value in their extra space or rental property.

On one hand, the vacation rental phenomenon is an emerging trend in the visitor industry. As such requires monitoring, planning, and strategy development in order to respond effectively. It has led to a decade of product development, marketing and communications plans in the firms that make up our visitor industry and at the Hawai'i Tourism Authority (HTA) the agency that guides our destination marketing.

On the other hand, the nature of the vacation rental market is such that the housing units used to provide opportunity for our visitors may have put the visitor industry in competition with the residential housing market. Many resulting problems were alleged, not the least of which was concern that the increasing demand for vacation rental units (VRU) might be depleting Hawai'i's residential housing stock.

A. PURPOSE

The study was commissioned by the HTA as part of their effort to understand the development of the vacation rental phenomenon in Hawai'i, to provide information to industry and government planners who were seeking to deal with the issue, and to support their own efforts at product development, marketing and communications.

The research objectives were: (1) to investigate the impact of vacation rental units on the residential housing market; and (2) to provide further information on the structure and workings of the vacation rental phenomenon in Hawai'i.

Within the latter objective, it was understood that the study would add information on the sharing economy, the role of property managers, and the use of online booking sites.

B. METHODS

The study made use of several data sources. It involved a literature search, examination of published data on the housing market (primarily the U.S. Census) and data on the visitor accommodations market (from HTA with emphasis on the Visitor Plant Inventory). In an effort to gather details on the use of rental properties in Hawai'i, two survey efforts were mounted. The first was to add questions to the Hawai'i Housing Planning Study, 2016, a survey of a probability sample of all Hawai'i resident households, owned and rented. The second was a separate survey of Hawai'i property owners with addresses outside the State. The literature search would provide context; the published data would provide the structure of the visitor accommodations and housing markets; and the surveys would provide new information on the use of residential properties as rental properties.

Additional information on the methods used to design, conduct, and analyze the two surveys is presented in the appendix to this report.

II. HOUSING AND TOURISM

Hawai'i has a thriving visitor industry because it has many amenities – a pleasant climate, scenic beauty, great beaches and water sports, good visitor products and infrastructure, a well-trained and experienced labor force, a pleasant lifestyle, and a host culture that provides a foundation for hospitality and our Aloha Spirit.

The visitor industry has been Hawai'i's number one industry since replacing sugar and pineapple production in the nineties. It provides about 165,000 jobs per year, accounts for a substantial percent of the GSP and contributes \$1.9 billion each year in Hawai'i State General Excise Tax and the Transient Accommodations Tax.

Most residents understand the value of tourism to our economy.¹ They also know tourism can generate low-wage jobs and is subject to the volatility of international travel markets. A strong visitor industry may also bring higher population growth, greater external housing demand, and higher housing prices. The whole situation can be exacerbated by large expenditures for destination advertising.

What is of interest to us here is the impact of the visitor industry on the residential housing market in Hawai'i. Do rising room rates affect residential rents? Do very high visitor room rates lead to a loss of residential housing stock?

A. TRADITIONAL RELATIONSHIP

The traditional relationship between tourism and housing markets starts with tourism's benefits to local economies. Virtually all sources agree: (1) tourism is a good way to turn non-economic assets into exports, improve the economy, create jobs, and generate income²; and (2) if you choose the visitor industry as a way to run your economy, you can expect high housing prices³ and other problems.⁴ Fitz (2006) showed that

tourism leads to an increase in second homes⁵, which increases property taxes and Biagi, *et.al.*, found that higher housing prices lead to issues in affordability, displacement, and gentrification.⁶ These research findings may not surprise anyone in Hawai'i's visitor industry.

In Hawai'i, the academic literature has not produced much on the direct impact of tourism on the housing market. The popular literature, on the other hand, has taken up the topic. The mainstream media and the bloggers have investigated the relationship between the visitor industry and the residential housing industry from several different points of view. They have already contributed many column inches and their interest in the topic continues. The reports include comments like, "Some people complain that illegal rentals have caused housing prices to soar and have torn apart communities where residents know all their neighbors".⁷ In addition to these public reaction stories, some data appeared, noting that, "at 80 percent occupancy, the average Airbnb rent in 2015 would bring in \$5,900 per month." That is nearly 3.5 times the average rent for a residential rental unit in 2015.⁸

What concerns us here is one particular part of visitor industry operations in Hawai'i -- the number of rental properties being used for short-term rentals to transient parties. Short-term means rental contracts for 30 days or less. Transient parties include visitors from out of state and over-night-or-longer interisland visitors.

¹ Hawai'i Tourism Authority, *Resident Sentiment Survey, 2015*, p.7.

² Gunderson, Ronald J. and Pin T. Ng. 2005. Analyzing the effects of amenities, quality of life and tourism on regional economic performance using regression quantiles, *Regional Analysis & Policy*, vol. 35, no. 1.

³ Reeder, Richard J. and Dennis M. Brown. 2005. Recreation, tourism, and rural well-being. United States Department of Agriculture, Economic Research Services, Economic Research Report Number 7, August, 2005. See also Ko, Dong-wan and William P. Stewart. 2002. A structural equation model of residents' attitudes for tourism development, *Tourism Management*, Vol. 23, pp. 521-530, 2002. See also, Affordable homes and tourism are election issues in Midhurst, *Midhurst and Petworth Observer*, (UK), April 13, 2015.

⁴ Carlino and Saiz (2008) used visitor arrivals as a measure of consumer preference for local amenities. They found: (1) amenities were linked to population and job growth; (2) "beautiful cites" attracted more skilled employees; (3) growth in visitor arrivals was related to accelerated housing price appreciation, especially in supply-inelastic markets; and (4) local investment in physical amenities resulted in increased demand for visits. They saw this as evidence of a self-perpetuating cycle of tourist development housing appreciation.

⁵ Fitz, Richard G. (1982) Tourism, vacation home development and residential tax burden: A case study of the local finances of 240 Vermont towns, *American Journal of Economics and Society*, Vol. 41, No. 4, pp. 375-385, October 1982.

⁶ Biagi, Bianca, Dionysia Lambiri, and Alessandra Faggian. 2012. The effect tourism on the housing market, in Uysal, M., *et. al.*, (eds.), *Handbook of Tourism and Quality-of-Life Research: Enhancing the Lives of Tourists and Residents in Host Communities*, International Handbooks of Quality-of-Life, Springer Science+Business Media B.V. 2012.

⁷ Riker, Marina. 2015, State, City looking to crack down on illegal vacation rentals, *Honolulu Civil Beat*, March 10, 2015.

⁸ Honolulu rental market: Affordable rental housing study update, 2014, prepared by Ricky Cassidy for Department of Community Services, City and County of Honolulu, December 30, 2014, p. 115.

These types of rental units have been discussed using a variety of names. In this report, we will use the term Vacation Rental Units (VRU). VRUs include single-family detached and multi-family dwelling units. As used here, VRUs include single-family rentals, multifamily condominium rentals, and bed and breakfast properties. Some VRUs started as visitor accommodations units and others may be transformed residential housing units. In Hawai'i, as in other visitor destination areas, VRUs are subject to regulations, registrations, business taxes, and tourist taxes. Also, like other visitor communities, there are claims that some VRUs operate illegally, in violation of zoning codes or tax responsibilities.

Regardless of the nomenclature, there is little doubt that the number of VRUs in Hawai'i has been increasing. The Visitor Plant Inventory (VPI) shows an increase from 2,438 in 2005 to 10,768 in 2015⁹, or about 34 percent per year. VPI Supplemental Studies¹⁰ used a different method to show that individually advertised units (IAU) counts may be as high as 27,000 in 2015.

VPI supplemental studies show that short-term IAUs are located in nearly all communities in Hawai'i, suggesting that residential housing stock may have been affected. The same studies also show that the units are heavily concentrated in visitor destination areas.

B. VISITOR RESEARCH DATA

Hawai'i's tourism economy has been growing strong for the last seven years. Visitor arrivals grew by 32.9 percent since 2009 (Table 1). Throughout the period of rapid growth, the

pattern of visitor accommodations use remained relatively stable. The percent of visitors who stayed at commercial visitor accommodations units grew by only two percent in seven years. The rest, (those who stayed with friends and relatives or aboard cruise ships) dropped sharply in 2008-2009 and the segment was much slower to recover after 2010.

Table 1 presents data for the recovery period following the Great Recession. Between 2005 and 2009, the number of visitor arrivals dropped from 7.4 million to 6.4 million (-13.4%). Between 2009 and 2015, visitor arrivals grew from 6.4 million to 8.5 million (32.9%). The recovery was well under way by 2012 and growth continued at a rate of 4.5 to 5.0 percent per year.

The number of visitor parties using traditional commercial visitor accommodations units¹¹ grew on a par with visitor arrivals -- from 5.3 million in 2009 to 6.9 million in 2015 (31% vs. 33% for arrivals). The percent of parties using traditional visitor accommodations units was steady throughout the recovery period with a growth rate of about 2 percent over five years.

There was a significant increase in demand for vacation rental units (including B&Bs). The percent of parties that used these units nearly doubled between 2009 and 2015 (5.4% to 10.7%). The VRU growth rate was almost 8 percent during the recession (2005-2009). Furthermore, the growth rate for use of VRUs by Hawai'i's visitors outpaced the use of traditional visitor accommodations during this period.

Hotel occupancy rates rose from 65 percent to 79 percent during the recovery for a 21.7 percent growth rate over five years. Most of the growth occurred before 2012 and occupancy rates have been relatively steady for the last three years. Moreover, even if the traditional visitor accommodation unit numbers suggest some loss of market share to VRUs, the share of revenue may not have been affected. Average daily hotel room rates rose from \$177 to \$240 during the same period, a growth of 36 percent.

⁹ The Hawai'i Visitor Plant Inventory is an annual count of visitor accommodations units conducted by HTA. The study develops a list of visitor properties and then surveys them to measure the number of rooms available to visitors. Obtaining an accurate list of VRUs has been increasingly difficult and VPI has acknowledged that VRU counts may be underestimated.

¹⁰ *Individually Advertised Units in Hawai'i*. (SMS, 2014) estimated the number of VRUs from rental units advertised on vacation rental booking sites. In 2015, the supplemental study was published as part of VPI 2015. Following HTA's lead, we will refer to vacation rental units measured in VPI as VRU and individually advertised vacation units as IAU.

¹¹ Hotels, condominium hotels, and timeshare units.

Table 1. Hawai'i Visitor Industry Statistics, 2008 – 2015

	2008	2009	2010	2011	2012	2013	2014	2015	% Chg.
Visitor Arrivals (x1,000)	6,713	6,420	6,917	7,174	7,867	8,003	8,184	8,534	32.9%
Number of Parties (x1,000)	2,964	2,899	3,102	3,282	3,497	3,510	3,662	3,915	35.0%
Percent Use Commercial Units^a	87.7	87.6	88.0	88.8	89.4	89.7	89.6	89.4	2.1%
Percent Use Traditional Units^b	82.1	82.2	82.4	82.6	83.0	82.5	81.9	80.9	-1.5%
Percent Use VRU	5.5	5.4	5.6	6.2	6.4	7.1	7.8	10.7	98.1%
Hotel Occupancy Rate	70.5	64.9	70.7	73.3	76.9	76.6	77.1	79.0	21.7%
Average Daily Room Rate	\$201	\$177	\$174	\$190	\$205	\$230	\$243	\$240	35.6%
Average Residential Rent Rates		1,654	1,607	1,645	1,734	1,717	1,761	1,888	14.1%

a. The percent of all visitor parties that used any type of commercial visitor accommodations units. Excludes those who stayed with family and friends and those who remained aboard a cruise ship.

b. The percent of all commercial accommodations user parties that use traditional visitor accommodations units – hotels, apartment hotels, condominium hotels, hostels, or timeshare units.

Sources: DBEDT, HTA Annual Reports, Rent Range

Finally, Table 1 presents data on the median monthly rent for residential housing units in Hawai'i. The median rent rose from \$1,654 in 2009 to \$1,888 in 2015 -- a 14 percent growth rate over five years. So, as the post-recession recovery proceeded, growing visitor arrival numbers were met by rising visitor rents (ADR). Residential rents grew by about a third of the rate in the visitor industry. A property owner considering the prospects of renting to visitors rather than residents might have been convinced by the numbers. There was a substantial difference in what could be charged for a room night – perhaps 3 to 4 times the local residential rate. In addition, there was a potential for even higher rents in the future as visitor rental rates grew much faster than residential rates.

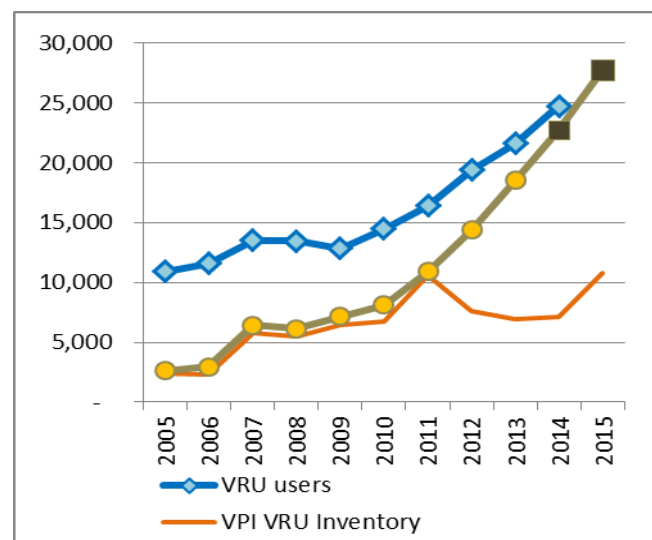
C. HOUSING STUDY RESEARCH

This study brings new data to the subject. A set of questions sponsored by HTA were included in the demand survey and there was a separate survey of out-of-state property owners. The demand survey queried Hawai'i property owners on the use of their real estate as rental property and asked whether they rented to visitors. The out-of-state property owners' survey asked similar questions of a sample of owners whose tax billing address was outside of Hawai'i. It also borrowed data from the most recent visitor research by HTA.

1. Estimating VRU from Visitor Data

The HTA Visitor Plant Inventory (VPI) provides historical data on accommodations units available to house Hawai'i's visitors. Table 1 summarizes trends in visitor accommodations between 2005 and 2015. Figure 1 shows recent estimates of the number of VRUs from the VPI and the number of IAUs from the VPI and supplemental studies.

Figure 1. VRU & IAU Inventory in Hawai'i, 2005-15



From 2005 to 2010, the IAU line is from VPI. The last two years are from the supplemental studies. Values for the years 2009 through 2013 were estimated by SMS.

Figure 1 also shows the number of Hawai'i visitor parties that stayed in vacation homes between 2005 and 2014, as reported in HTA's Basic Data Series. The latter rose sharply after 2009 in much the same pattern as shown for IAUs in the supplemental studies.

Projecting the supplemental study IAU estimate, there were as many as 33,801 vacation rental properties in 2016. Recall that IAUs include both commercial and non-commercial rentals. VRUs, on the other hand exclude resort condominium and condominium hotel properties.

2. Estimating VRU from Survey Data

Survey data were used to estimate the number of properties that were available for rent to

visitors. (Table 2). The 1,348 respondents in the out-of-state survey represented 72,639 out-of-state property owners in that survey's sampling frame. The 5,800 Housing Demand Survey respondents represented about 462,876 resident households, of which 263,178 (57%) own residential real estate other than their permanent residence.

Table 2 presents survey estimates for the number of properties that were ever rented, that were rented at least some of the time to visitors, and that were rented to visitors on short-term contracts. Results show that there were 45,075 properties available for short-term rental to visitors in 2016. That figure includes some commercial visitor rental properties.

Table 2: Vacation Rental Properties, Hawai'i, 2016

		Total Properties Available	Rent Property		Rent to Visitors		Rent to Visitors Short-Term	
			Num	% Rent	Num	% rent to visitor	Num	% short-term
Out-of-State	owners	72,639	45,337	62.4%	23,155	31.9%	20,796	28.6%
	properties	110,411	69,819	63.2%	31,402	28.4%	31,402	28.4%
In-State	owners	263,178	44,907	17.1%	11,165	4.2%	10,027	3.8%
	properties	294,759	67,132	22.8%	15,326	5.2%	13,673	4.6%
Total	owners	335,817	90,244	26.9%	34,319	10.2%	30,823	9.2%
	properties	405,171	136,951	33.8%	46,728	11.5%	45,075	11.1%

Source: HHPS Housing Demand Survey, 2016; Out-of-State Property Owners Survey, 2016.

Not surprisingly, most (69.7%) were properties placed on the market by out-of-state property owners.

3. Adjusting the estimates

At first glance, the two surveys appear to provide very different estimates of the number of vacation rental properties in Hawai'i. The VPI supplemental studies measured IAU as the number of properties offered for rent by on-line booking sites at a specific point in time. The Out-of-State Survey measured VRUs as the number of properties rented to visitors on short-

term contracts at mid-year. The two sources can be reconciled, however.

Supplemental study estimates would be short of the Out-of-State Survey estimate by: (a) the number of properties not advertised at the time Internet downloads were made; (b) the number of properties not advertised on online booking sites, and (c) the number of unduplicated properties advertised on booking sites not included in the supplemental studies (VPI 2015, p. 63).

The out-of-state property owners survey (OOS Survey) showed that 19 percent of properties

were not advertised in any media. Reducing the 45,075 total properties by 19 percent produced an estimate of 36,510 IAUs in the OOS Survey (Table 3).

The supplemental studies estimated commercial properties to be about 37 percent of the total properties advertised. Subtracting that percent from both estimates produces the new estimates shown in Table 3, suggesting there were between 21,295 and 23,002 non-commercial VRUs advertised online in Hawai'i in 2016.

The supplemental studies were based on four large online booking sites only -- VRBO, FlipKey, Airbnb, and Clearstay. Those four sites accounted for 84.3 percent of the sites named by OOS Survey respondents¹². Adjusted for the non-coverage factor,¹³ the new estimate for IAUs in 2016 would be 21,998 properties.

Table 3: Estimating VRUs from Two Studies

	Total properties available for short-term visitor rentals (OOS Survey)	Total individually advertised properties (supplemental surveys)
Total	45,075	33,801
advertised only	36,510	33,801
commercial	13,509	12,506
VRU	23,002	21,295
VRU adjusted for non-coverage	23,002	21,988

The analysis shows the two sources of data can be reconciled within 1,000 properties. In 2016, there were between 21,295 and 23,002 non-commercial VRUs advertised online in Hawai'i.

Not all properties were advertised sites every day and properties not advertised on the day survey samples were selected could not be selected. The number of properties advertised on a given day is unknown and supplemental

¹² Out-of-State Property Owners Survey, 2016.

¹³ The non-coverage factor is the number of properties advertised on sites other than the four listed here (unduplicated), divided by the total out-of-state survey property owners to rent to visitors, plus one.

surveys underrepresent those properties. The HHPS survey population included all properties regardless of how many times they were advertised. However, it did not measure the owners' advertising habits and provided no way to adjust the IAU count. We did not adjust for this factor in this analysis.

4. Summary

The surveys done for this report -- the OOS survey and the HHPS resident survey -- provide a comprehensive description of the vacation rental situation in Hawai'i in 2016.

About 405,171 accommodations properties were available to visitors in 2016. These were properties that were not being used as a primary residence by either residents or out-of-state owners. About 34 percent of those (136,951 properties) were rented for at least part of the year and 12 percent of them (46,728 properties) were available visitors. Nearly all (96%) of the available properties (45,075 properties) were available for short term rentals (Table 2).

Of the 45,075 properties available for short-term rentals, 81 percent (36,510 properties) were advertised online and can be classified as IAUs (Table 4). Among the 45,075, 63 percent (28,398 properties) were residential rather than commercial -- an estimate of the number of residential apartments and houses being used to as vacation rentals that year.

Table 4: Types of Vacation Rental Property, 2016

	Total	Advertised online (IAUs)	Not advertised online
Total	45,075	36,510	8,565
Commercial	16,677	13,508	3,169
Residential	28,398	23,002	5,396

Commercial vacation rental units are those found in traditional commercial visitor accommodations including hotels, condominium hotels and other condominium structures. B&B units are included as residential.

We also know that 34,402 (69.7% of all the properties) were owned by persons who reside outside of Hawai'i and 30 percent of the properties were owned by Hawai'i residents.

III. IMPACT ON HOUSING

This study was intended to look into the structure of the vacation rental situation in Hawai'i and to determine if it was affecting the residential housing market. Specifically, there was interest in two propositions stating: (1) the rising number of vacation rental was associated with rising residential rents and (2) rising demand for vacation rentals was working to reduce the residential housing stock.

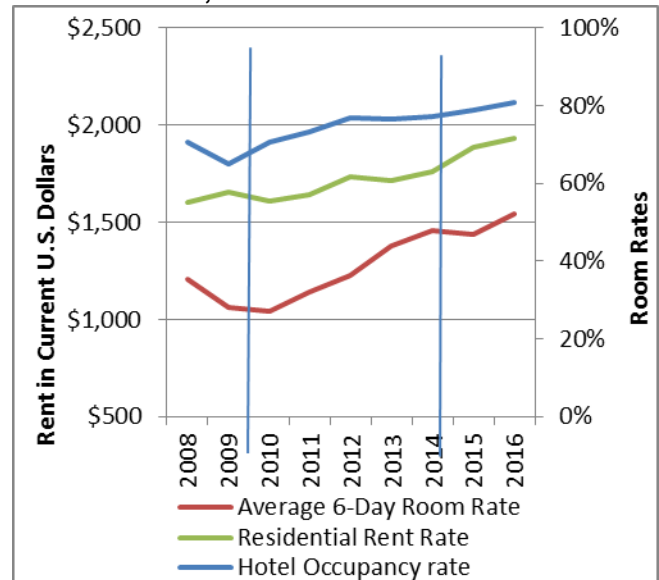
A. IMPACT ON RESIDENTIAL RENTS

Some studies have suggested that there is a relationship between greater use of vacation rentals and higher housing prices. The National Association of Realtors (NAR) blogs that VRUs increase rents, decrease affordability, and draw developers' attention to the top of the market. Local researchers report that VRUs exacerbate the affordable housing problem by reducing our housing stock and driving up rents, which in turn inflates demand for investment properties at the high end of the market.¹⁴

Figure 2 brings together some important data for visitor and residential rents. The objective was to compare rates of change over time. For the residential figures, we chose contract rent rates for all rental units in the State.¹⁵ We added the hotel occupancy rate as an indicator of demand for visitor units.

For the visitor data we took the average daily room rate (ADR) for all commercial properties.¹⁶ Figures shown here are six times the ADR to accommodate the scale of the graph. The graph compares the six-day rate with the monthly rate for residential housing.

Figure 2. Hawai'i Visitor Room Rates and Resident Rates, 2008-2016



Source: Hospitality Advisors; Rent Range. 2016 figures are for first quarter only.

During the Great Recession visitor room rates fell and resident rents were stable. After 2009, rents in the residential market rose steadily at a rate of about 3 percent per year. Visitor rates rose at a faster rate than resident rates. Some observers interpreted the 2015 drop in visitor rates as a "leveling off" of ADR. First quarter 2016 data suggest it may have been an anomaly.

The fact that any two data series rise at similar rates does not mean they are causally related, of course. Demonstrating causality would require a more complex econometric analysis - one that is beyond the scope of this project.

We did, however, compare residential contract rent rates in different neighborhoods. If tourism affects resident rents then we might expect differences across geography. Specifically, neighborhoods nearer resort developments might have higher rents and faster growth than in neighborhoods that are more distant from resort areas. Neighborhoods farther from resorts might not be affected by hotel room rates.

We identified zip code areas with major resorts and labeled them "visitor destination areas"

¹⁴ Osborne, Isis and Benjamin Sadoski. 2016. The hidden cost of hidden hotels: the impact of vacation rentals in Hawai'i, in UNITE HERE Local 5, May, 2016, p. 8.

¹⁵ Rent Range, average monthly rent for all rental units.

¹⁶ DBEDT Data Book 2015 includes rates for hotels, condo hotels, and timeshare units. We used Hospitality Advisors reports for 1st quarter 2016 estimate.

(VDA). Other zip codes were categorized as “other, residential”.

The City and County of Honolulu has the highest average monthly resident rent (\$2,261), the highest rental growth rate (26.1%), and the

highest six-year rate of growth in ADR (47%). Other than those observations, strong patterns are not revealed in the marginal data and the rankings of the other counties are different for each of the variables in Table 5

Table 5. Residential Contract Rent for Visitor and Non-visitor Areas, by County, 2010-2015

Geographic Area	Average Monthly Residential Rent			% change in ADR, 2010 – 2015
	2010	2015	% Change	
Hawai'i County	\$ 1,281	\$ 1,502	17.2%	24.4%
Visitor destination areas	\$ 1,438	\$ 1,760	22.4%	
Other, residential areas	\$ 1,217	\$ 1,427	17.2%	
Honolulu County	\$ 1,793	\$ 2,261	26.1%	47.0%
Visitor destination areas	\$ 1,987	\$ 2,563	29.0%	
Other, residential areas	\$ 1,757	\$ 2,205	25.5%	
Kaua'i County	\$ 1,407	\$ 1,700	20.9%	41.7%
Visitor destination areas	\$ 1,397	\$ 1,741	24.6%	
Other, residential areas	\$ 1,414	\$ 1,669	18.1%	
Maui County	\$ 1,709	\$ 1,753	2.6%	39.9%
Visitor destination areas	\$ 1,824	\$ 1,935	6.1%	
Other, residential areas	\$ 1,644	\$ 1,651	0.4%	

ADR = average daily room rent. Sources: Rent Range and Hospitality Advisors.

However, the relationship between rents in neighborhoods near resorts and those further away is the same in all four counties. In all counties, residential rent rates in VDAs are higher than rents in other neighborhoods. In every county, rental growth rates were higher in VDAs than in other neighborhoods. Across all counties, the VDA rental growth rate was always closer to the ADR growth rate than was the case for non-VDA neighborhoods. The results are consistent with the proposition that increasing residential rents are related to increasing visitor rent rates in Hawai'i.

The results of this analysis are insufficient to demonstrate a causal link between visitor unit rents (room rates) and local residential rents. The analyses are however, consistent with the hypothesis and we found no evidence to the contrary.

B. IMPACT ON HOUSING STOCK

Speculation is that the increase in visitor arrivals, the slow growth of the visitor plant, the pressure of visitor demand for units in the community, and the advance of Internet booking sites decreased the size of the residential housing stock. The HHPS and OOS surveys found there were about 45,075 housing units being rented to visitors on short-term contracts in 2016 (see Table 2).

Housing Stock Size

Among the 524,852 housing units in Hawai'i in 2014, 477,520 housing units were available to the resident housing market; 450,299 were occupied housing units and 27,221 were available vacant units (Table 6).

About 47,333 housing units (9.0%) were not part of the housing stock in 2014. Those units are

shown as “vacant unavailable” in Table 6 and include those vacant for seasonal, recreational, or occasional use, held off for use by migrant agricultural workers, and “other vacant”.

Units that are vacant for seasonal, recreational or occasional use (seasonal) are the largest component of Hawai'i's unavailable housing units. There were 33,054 of them in 2014. That was 69.8 percent of vacant and unavailable housing units and 6.3 percent of all housing units in the State.

Hawai'i is in the top quartile among states losing housing units to vacancies. We ranked 12th for percent of total housing units held for

seasonal, recreational, and occasional use in 2014. Only two states ranked higher than the counties of Hawai'i, Kaua'i, and Maui with respect to the percent of total units held off the market for seasonal use.

Across the State, there were major differences in the percent of total housing units counted as housing stock. In the City and County of Honolulu, 5.3 percent of all units were unavailable. In the other counties, that figure was three times higher, exceeding 17 percent for the Counties of Hawai'i and Kaua'i and over 13 percent for Maui County.

Table 6. State of Hawai'i, Changes in Housing Stock, 2011-2014

	2011		2014		Change 2011-2014	
	Number	Percent	Number	Percent	Number	Percent
Total Housing Units	516,394	100%	524,852	100%	8,458	1.6%
Total Available Housing Stock	473,676	92%	477,520	91%	3,844	0.8%
Total Occupied Housing Units	445,513	86%	450,299	86%	4,786	1.1%
Total Vacant Units	70,881	14%	74,553	14%	3,672	5.2%
Vacant Available	28,163	5%	27,221	5%	-942	-3.3%
For Rent	19,560	4%	18,704	4%	-856	-4.4%
Rented, not occupied	2,086	0%	2,418	0%	332	15.9%
For Sale only	4,913	1%	4,085	1%	-828	-16.9%
Sold, not occupied	1,604	0%	2,014	0%	410	25.6%
Vacant Unavailable	42,718	8%	47,332	9%	4,614	10.8%
Held for seasonal use	29,564	6%	33,054	6%	3,490	11.8%
Held for migrant workers	162	0.03%	93	0.02%	-69	-42.6%
Other Vacant	12,992	2.5%	14,185	2.7%	1,193	9.2%

Source: ACS Table B25004, S2504, and S1101

These Census data can shed light on the relationship between residential housing availability and visitor industry activity. The key to understanding that relationship lies in these seasonal units. First, they are private sector residential units and not commercial units like hotels or other visitor accommodations units owned by corporate entities, which the Census does not classify as housing units. On the other hand, they may include units currently logged in Hawai'i's Visitor Plant Inventory, such as B&B, VRU house, and VRU condo units. The fact that their number is increasing faster than housing stock suggests either that the production of

seasonal units has been high and getting higher, and/or that some of the housing stock is being diverted to seasonal use.

2. Trends in Housing Stock, 2011-2014

Even before the 2011 data in Table 6, housing production was relatively high (Figure 3). Between 2003 and 2007, Hawai'i added 31,639 housing units to its total. Between 2007 and 2011, 14,895 were added. Between 2011 and 2014, 7,468 units were added to total housing

units.¹⁷ Clearly, annual housing production slowed dramatically in the first half of the present decade.

The change in housing stock, the units available to the local market, was even more dramatic. Before 2011, the stock grew at a faster rate than total housing units (6,100 units per year between 2003 and 2011). After 2011, the pace slowed to 1,115 units per year.

It may be tempting to attribute slower growth to the slow pace of recession recovery and let it go at that. But the lagging housing stock trend was matched by an increase in the number of vacant and unavailable units across the state, a growing part of which took place among the seasonal units. The number of new seasonal units added each year was 564 units per year before 2011 and 1,163 units per year thereafter.

That caused a drop in the number of vacant and available housing units (2,334 units per year before 2011 to -314 per year afterward).

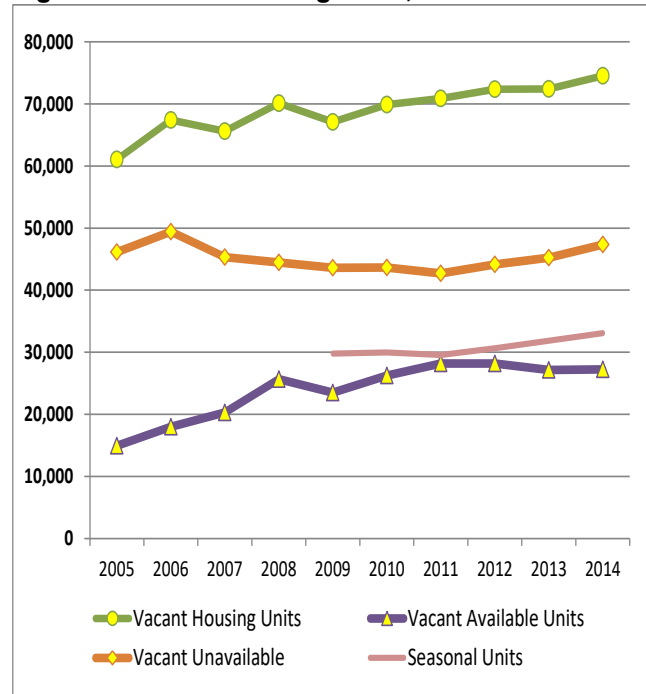
Table 6 shows that growth in housing stock (units available to the local housing market) was less than one percent over four years. The larger changes were in vacant units categories. The State lost 942 vacant and available housing units between 2011 and 2014. On the other hand, the vacant and unavailable housing stock went up by 4,614 units in those last four years. Their number increased by 11.8 percent from 2011 to 2014. That was more than twice the growth rate for vacant and available units and almost 15 times the growth rate for the housing stock.

The construction slowdown held back growth in occupied units, but the most important changes were those in vacant units (Figure 3).

Over the past 15 years, the average annual increase in housing stock (occupied plus vacant and available housing units) was about 1 percent per year (Figure 2). Housing stock in the State of Hawai'i increased by 16 percent in the years

between 2000 and 2014. Honolulu increased its stock by 6 percent during this period.

Figure 3. Vacant Housing Units, 2005-2014



Source: ACS Table B25003, 5-yr estimates.

The County of Hawai'i had the largest average annual increase, adding 2.1 percent to its housing stock each year. The City and County of Honolulu had the smallest average annual increase at 0.6 percent per year. The counties of Maui and Kaua'i added 1.7 and 1.4 percent to their total housing stock each year.

We did only one cross sectional study, so we don't know if property owners' behaviors are changing from survey data. Data from VPI and the Census suggest that growth in visitor use has been high and shows no sign of slowing.

C. THE SHARED ECONOMY

The HHPS Housing Demand Survey also asked questions related to the "shared economy"¹⁸ as

¹⁸ Forbes. (2016). Also called collaborative consumption or the peer economy, owners rent out something they are not using, such as a car, house, or bicycle to a stranger using these peer-to-peer services. <http://www.forbes.com/pictures/eaji45emgkh/airbnb->

¹⁷ DBEDT Data Book 2014, Table 21.20, Housing Units by County: 2000 to 2014.

part of VRU use in Hawai'i. Among all Hawai'i homeowners, 12,337 (4.7%) rented rooms in their homes to non-family members. Of those, about 2,029 (16.5%) rented rooms to visitors. That would mean that the shared economy affects about 0.4 percent of Hawai'i's housing units. That is consistent with sharing data available from Airbnb. They report that more than 75 percent of Airbnb's Honolulu clients rent the entire property.

IV. OUT-OF-STATE PROPERTY OWNERS

In the earlier treatment of vacation rental properties the data were taken from both the resident and out-of-state property owners. The survey of out-of-state property owners provided an opportunity to delve more deeply into the conditions and behaviors of that group of property owners¹⁹.

There were 72,639 property owners with addresses outside the State of Hawai'i in 2016. The majority of them came from the United States (89%), Canada (8%), Japan (3%) and other (1%). The Other category included responses from Australia, New Zealand, China, England, Hong Kong, Germany, Netherlands, Singapore, South Africa and Sweden.

The disposition of those properties is roughly as shown in Table 7²⁰. Many owners held more than one property and some had properties in more than one county. We asked survey respondents to tell us about the property they purchased most recently and we report those data here. In addition, there were some properties that were not classified as either single-family units (a house) or unit in a multi-family or multi-unit building. Some properties had no unit

classification²¹ and we excluded those from this report. They are reported in the appendix tables.

About 25 percent of the properties most recently purchased by OOS Survey respondents were single-family homes. The remaining 75 percent were units in multi-unit buildings.

The City and County of Honolulu had 25,785 of these units in 2016, which was about 7.6 percent of total housing units in the county. There were 16,699 of these properties in the County of Hawai'i, which was 19.9 percent of their total housing units. Kaua'i County had 7,661 out-of-state owner properties and that was 25.4 percent of their total housing units. Finally, Maui County reported 20,793 for the highest rate of out-of-state properties at 29.3 percent. These figures will be familiar to those who use the housing statistics often (see Table 7).

Table 7: Out-of-State Property Owners, 2016

		Rental Property Type		
		Single Family	Multi-Family	Total
Number		17,913	45,716	70,938
County	Hawai'i	5,815	6,722	16,699
	Honolulu	6,480	18,225	25,785
	Kaua'i	3,223	3,877	7,661
	Maui	2,395	16,892	20,793
Primary Use	An investment	32.4	38.7	39.0
	Vacation home	22.0	34.3	30.7
	Second residence	32.5	24.2	23.2
	Primary home	8.1	1.1	3.0
	Other	5.0	1.7	4.2

Most out-of-state property owners considered their Hawaii property to be a residence. Only 39 percent consider the property to be an investment. About 54 percent would call it their vacation home or even a secondary residence. Three percent say it is their primary residence and many in the "other" category think of their Hawai'i property as their "future home".

[snapgoods-and-12-more-pioneers-of-the-share-economy/#3608f0f97226](https://www.snapgoods.com/blog/12-more-pioneers-of-the-share-economy/#3608f0f97226)

¹⁹ The out-of-state property owners used here will not match estimates of out-of-state buyers in *Residential Home Sales in Hawai'i: Trends and Characteristics*, DBEDT, May 2016. They differ in definition, time, and coverage.

²⁰ Insufficient data regarding the property type was provided by 1,701 of the property owners, which accounts for the difference between the 72,639 property owners and the 70,938 properties detailed in Table 7.

²¹ Nearly all were classified as "undeveloped property" and nearly all were located in the County of Hawai'i. The data were taken from the sample file and referred to the condition of the property at the time of sale.

Table 8 shows us that some properties were purchased as many as 46 years ago. That was consistent with recent data suggest that buying Hawai'i property has become increasingly popular since the nineties.²²

Table 8: Characteristics of Unit Purchased

		Rental Property Type		
		Single Family	Multi-Family	Total
Number Renting		17,913	45,716	70,938
Year Bought	Before 1970	3.2	0.9	1.6
	1971 to 1990	8.2	11.8	10.7
	1991 to 2000	19.6	25.0	23.3
	2001 to 2010	31.6	37.3	35.7
	2011 to 2016	37.4	25.0	28.8
Type	Condominium	15.8	96.9	71.8
	Not condominium	84.2	3.1	28.2
Size	1 bedroom	2.1	38.5	27.6
	2 bedrooms	17.0	45.7	36.8
	3 bedrooms	46.1	13.6	23.4
	4+ bedrooms	33.9	1.3	11.2
	No data	1.0	0.8	1.0

Out-of-State property owners seemed to have preferred condominium units (71.8%) and that is consistent with their choice of multi-family units (64.4%). They also bought relatively large units as shown in Table 8. At the same time, the preference for single-family units has been increasing. Between 1970 and 2010, the percent of rental properties that were single-family units rose about three points, from 19 percent to 22 percent. Between 2010 and 2016, the percent that were single-family went up 11 points to 33 percent of all properties rented.

Overall, their properties included more 4-bedroom units than the overall multi-family residential housing stock (16.0% vs 3.9%), and fewer one-bedroom units (28.4% vs 32.1%).

Regardless of the reason for buying their properties, there is evidence that the owners do

²² These data may exaggerate the trend somewhat. They include 26 percent non-response and it is not unreasonable to expect that non-response may be more prevalent among older owners who bought their property many years ago.

not usually let the property sit idle (Table 9). About 62 percent of all out-of-state property owners rent their properties when they are not using them.

Renting was more likely to occur for multi-family than for single-family properties. Similarly, multi-family units were more likely than single-family units to be rented to visitors (42.9% vs 19.7%). Finally, multi-family property owners were more likely to say they did not know to whom the property was rented because an agent was handling that for them. Nearly 30 percent of them gave that response (29.3%), compared with 13.5 percent of single-family property owners.

Table 9: Disposition when not occupied by owner

		Rental Property Type		
		Single Family	Multi-Family	Total
Number Renting		17,913	45,716	70,938
Use ^a	Rented	54.3	69.5	62.0
	Left vacant	32.0	28.0	30.8
	Loaned to family	23.3	20.1	19.5
	Other	6.1	2.1	4.5
	No data	3.0	0.9	2.3
Rent to ^b	Visitors	19.7	42.9	38.6
	Residents only	66.9	27.8	35.0
	Don't know	13.5	29.3	26.4

- How is the property used when not occupied by the owner (multiple choices permitted)?
- To whom is the property rented?
- Includes visitors only and visitor a residents.
- Do not know to whom it is rented because and agent lists the property.

The OOS Survey also showed us that out-of-state owners use their properties frequently, but for relatively short periods on each visit. Table 10 presents the data. Further detail is available in the appendix tables.

About 42 percent of out-of-state owners were in Hawai'i less than once a year since 2011. The rest were here more than once a year. Most of them stay in their properties when they visit, but there are about 9 percent who say they have never stayed in their Hawai'i property.

Table 10: Current Use of Units

		Rental Property Type		
		Single Family	Multi-Family	Total
Number Renting		17,913	45,716	70,938
Frequency ^a	0 to 5 times	36.3	41.3	39.8
	6 to 10 times	27.9	33.1	31.5
	11 to 15 times	16.4	15.7	15.9
	16 or more	19.4	9.9	12.8
Last Visit ^b	Before 2000	1.2	2.7	2.2
	2000 to 2005	2.3	2.1	2.1
	2006 to 2010	4.5	4.7	4.6
	2011 to 2016	84.5	80.1	81.8
	Never stayed	7.5	10.4	9.3
Stay ^c	2 weeks or less	48.8	51.6	51.3
	2 to 4 weeks	25.4	23.3	23.7
	1 to 6 months	23.9	23.7	23.5
	More than 6 months	1.9	1.5	1.5

- a. Number of times you visited Hawai'i in the last 5 years.
b. Last time you visited Hawai'i and stayed at your property
c. Average length of stay in your unit.

The grand majority of owners (75%) spend less than four weeks in their units when they visit the State. Only 1.5 percent stayed longer than six months.

Even those out-of-state owners who stay more than a month (24%) were in the state for less than 6 months. This would suggest that their properties are on the rental markets in Hawai'i for many days during the year.

Further analysis showed that less than 10 percent of all out-of-state property owners were in town for more than 100 days during the last year, meaning that they would be classified as part-time residents of Hawai'i. The remaining 90 percent would be classified as visitors.

The OOS survey gathered information on occupancy rates this year. All out-of-state owners who rented to visitors were asked to report: (1) the number of days in calendar 2015 on which their most recently acquired property was available for rent; and (2) the number of days that unit was actually rented.

Slightly more than a third of the respondents (36.7%) provided useful information for both questions. The results are shown in Table 11 and data for the counties is shown in the appendix. The table includes the "other" units to show they are inconsequential to the rent analysis.

Table 11: Estimated Occupancy Rates for vacation rental units in Hawai'i, Calendar 2015.

Grouped Occupancy Rate	Property Building Type							
	single-family house		unit in a multi-family building		other		Total	
	Number	Pct.	Number	Pct.	Number	Pct.	Number	Pct.
>=0 and <=0.25	228	13.8%	1,025	6.9%	53	41.3%	1,306	7.9%
>0.25 and <=0.5	407	24.6%	2,691	18.2%	76	58.7%	3,173	19.2%
>0.5 and <=0.75	374	22.7%	4,772	32.3%	0	0.0%	5,146	31.1%
>0.75 and <=0.85	208	12.6%	3,135	21.2%	0	0.0%	3,342	20.2%
>0.85 and <=1	435	26.3%	3,139	21.3%	0	0.0%	3,574	21.6%
annual occupancy rate	62.3%		64.1%		70.1%		64.3%	
Total	1,652	100.0%	14,761	100.0%	129	100.0%	16,542	100.0%

Table includes only property owners who rent to visitors and who supplied occupancy rate data.

About a quarter (27%) of the properties had very low occupancy rates; less than fifty percent of available days. The other 74 percent had occupancy rates in excess of 50 percent of available days, and 22 percent had occupancy rates in excess of 85 percent.

The mean occupancy rate for 2015 was 64.3 percent for the State. Single-family homes had an occupancy rate of 62.3 percent. Multi-family units, which made up 89 percent of the properties for which data were available, had an occupancy rate of 64.1 percent.

V. VACATION RENTAL OPERATIONS

There were about 45,052 property owners who rented to visitors in the State in 2016. That was about 62 percent of all out-of-state property owners. Most of them (81%) owned units in multi-family buildings.

Table 12: Current Use of Units

	Rental Property Type		
	Single Family	Multi-Family	Total
Number Renting	8,227	36,326	45,052
a rental agent	54.4	61.8	60.7
has an IARA	51.4	74.5	71.3
advertise online	39.8	51.1	49.5
Use online booking sites	39.2	44.9	43.9

Table 12 shows that large percentages of the property owners who rent out their units have obtained professional assistance in handling the listing and rental of their properties. About 61 percent of them have engaged a local rental agent to handle the property. Seventy-one percent of them have an IARA) in place – consistent with the fact that about 70 percent of the properties appear to be condominiums in multi-family units.

About half of all the property owners tell us that their properties are being advertised on an Internet website. Reading between the lines in the responses to open ended survey questions, we surmise that these websites may be either unit-specific websites or building/property websites. The unit specific websites may be sponsored by the property owner or by smaller property management companies. The property-specific websites seem to be sponsored by larger condominium properties or chains.

Finally, about 44 percent of the out-of-state owners who rent their properties use online booking sites. In 2016, that was 14,278 property owners, many of whom may have more than one

unit. Listing on online booking sites was slightly more popular among multi-family property owners than among those who owned single-family properties (45% vs. 39%).

These estimates probably understate the use of online booking websites. Once again, we found that about 27 percent of the property owners did not know whether the property was being listed on a booking website because their agent was handling that decision for them. Further, just as use of an agent is more likely among multi-family than single-family property owners, lack of knowledge about website use among multi-family unit owners (28.1%) is nearly double the lack among single-family property owners (14.8%).

A. ONLINE BOOKING SITES USED

Among the 19,766 out-of-state property owners who listed their properties on an online booking site, 14,278 reported the name of at least one of those sites. The results are shown in Table 11.

About 15 percent of those who listed properties did not name a specific site. The average property owner identified about 1.5 booking sites for a total of 21,986 responses.

Confirming earlier research, VRBO leads the list, accounting for 38 percent of all listings. The next most frequently used site was Airbnb (9.3%) followed by FlipKey (6.9%). The list was long, but only one other site – Homeaway – accounted for more than one percent of the listings by out-of-state property owners.

Because the multi-family property rented made up nearly 90 percent of the respondents, their response pattern matches the total very closely. The pattern was similar for the single-family property listers, but VRBO was even more dominant among the booking sites with 43.5 percent of all listings.

Table 13: Online Booking Sites Used by Out-of-State Property Owners

		Property Building Type							
		single-family house		unit in a multi-family		other		Total	
		Number	Pct.	Number	Pct.	Number	Pct.	Number	Pct.
Online Booking Sites Used	Property Listed on VRBO	1,306	43.6%	9,081	37.8%	0	0.0%	10,386	38.0%
	Property Listed on AirBnB	409	13.7%	2,121	8.8%	0	0.0%	2,531	9.3%
	Property Listed on FlipKey	47	1.6%	1,777	7.4%	76	23.8%	1,899	6.9%
	Property Listed on ClearStay	0	0.0%	144	0.6%	0	0.0%	144	0.5%
	Property Listed on Other Site ^a	428	14.3%	3,575	14.9%	0	0.0%	4,003	14.6%
	use Homeaway	47	1.6%	282	1.2%	0	0.0%	328	1.2%
	use Automated Housing Referral Network	68	2.3%	135	0.6%	0	0.0%	203	0.7%
	use Aloha Condos	0	0.0%	139	0.6%	0	0.0%	139	0.5%
	use Kaua'i Calls	0	0.0%	114	0.5%	0	0.0%	114	0.4%
	use Castle Resorts	0	0.0%	92	0.4%	0	0.0%	92	0.3%
	use Expedia	0	0.0%	91	0.4%	0	0.0%	91	0.3%
	use Outrigger	0	0.0%	91	0.4%	0	0.0%	91	0.3%
	use Vay Cay Hero	0	0.0%	53	0.2%	0	0.0%	53	0.2%
	use Lodgify	0	0.0%	53	0.2%	0	0.0%	53	0.2%
	use Trip Advisor	0	0.0%	45	0.2%	0	0.0%	45	0.2%
	use Home Escape	0	0.0%	45	0.2%	0	0.0%	45	0.2%
	use CRH - Maui Kama'ole	0	0.0%	45	0.2%	0	0.0%	45	0.2%
	use Chase N Rainbows	0	0.0%	45	0.2%	0	0.0%	45	0.2%
	use Vacant Land	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	use non-Internet booking sites ^b	474	15.8%	1,150	4.8%	53	16.8%	1,678	6.1%
Total responses given	2,778	100.0%	19,079	100.0%	129	100.0%	21,986	100.0%	
Total owners responding	1,627		12,576		76		14,278		
Avg. sites used	1.7		1.5		1.7		1.5		
Renter knowledge of property rental details	not sure, agent lists property ^c	1,848	42.7%	18,585	61.9%	188	50.8%	20,621	59.4%
	certain about rent details	2,477	57.3%	11,450	38.1%	182	49.2%	14,109	40.6%
	didn't respond to rent questions	3,902		6,291		130		10,322	
	Total property renters	8,227	100.0%	36,326	100.0%	500	100.0%	45,052	100.0%

Finally, Table 13 also summarizes the impact that using an agent has on measuring property management behaviors among this group. In all, nearly 60 percent of all out-of-state property owners were unable to answer one or more property management questions on our survey.

Many did not know how bookings were made, what types of visitors were renting their properties, and what types of rental contracts were being made, or what systems were being used to list and book tenants for their properties. In some of the analyses we report here, the assumption was that these “unaware” respondents had behavior profiles similar to those of property owners who reported behaviors in detail. That may have been optimistic. Property managers have told us that rental agents are more likely to rent, more likely to list on booking websites, and more likely rent on short-term contracts.

Future research can adjust for these early research results and develop research designs and survey instruments that delve more deeply into these issues. In addition, it would be useful to gather the same information from local residents who rent their properties to residents and visitors.

VI. APPENDIX

A. DATA TABULATIONS

Table A-1. Hawai'i Visitor Data Relevant to Housing Issues, 2005 – 2014

State of Hawaii										
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total Visitor Arrivals	7,416,574	7,528,106	7,496,820	6,713,436	6,420,448	6,916,894	7,174,397	7,867,143	8,003,474	8,183,671
Number of Parties	3,303,596	3,163,070	3,196,938	2,963,989	2,898,622	3,101,746	3,181,551	3,496,508	3,510,296	3,661,598
Number in Party										
One	1,254,215	1,194,814	1,187,587	1,123,053	1,073,227	1,177,364	1,160,971	1,229,839	1,179,407	1,189,836
More than One	6,162,359	6,266,486	6,309,233	5,590,383	5,347,222	5,805,060	6,013,428	6,637,304	6,824,065	6,993,836
Average Party Size	2.245	2.38	2.345	2.265	2.215	2.23	2.255	2.25	2.28	2.24
Accommodations Used	7,416,574	7,528,106	7,496,820	6,713,436	6,420,448	6,916,894	7,174,397	7,867,143	8,003,474	8,183,671
use commercial accommodations	6,472,484	6,467,880	6,364,944	5,884,629	5,621,168	6,086,734	6,370,757	7,036,833	7,177,432	7,336,128
traditional commercial units	6,152,943	6,118,399	5,971,156	5,512,330	5,276,462	5,700,316	5,926,302	6,531,075	6,604,963	6,701,619
vacation rentals and B&B	319,541	349,481	393,788	372,299	344,706	386,418	444,455	505,758	572,469	634,509
friends and family, cruise ship	944,090	1,060,226	1,131,876	828,807	799,280	830,160	803,640	830,310	826,042	847,543
Hotel	4,978,189	4,776,824	4,673,074	4,200,086	3,982,525	4,364,269	4,495,032	4,991,399	5,041,993	5,197,999
Hotel Only	4,374,061	4,150,400	3,996,219	3,647,579	3,477,293	3,831,737	3,935,128	4,386,647	4,424,747	4,559,262
	59.0%	55.1%	53.3%	54.3%	54.2%	55.4%	54.8%	55.8%	55.3%	55.7%
Condo	1,232,099	1,269,461	1,321,675	1,194,370	1,107,427	1,227,357	1,311,971	1,388,027	1,459,174	1,439,829
Condo Only	945,667	977,209	1,014,851	919,443	862,733	967,050	1,031,992	1,087,395	1,138,757	1,121,138
Timeshare	539,706	630,726	668,400	672,565	699,840	719,669	717,697	761,894	758,692	764,842
Timeshare Only	390,677	470,740	500,571	508,588	534,691	554,270	550,853	586,143	586,480	586,066
Rental House	244,662	276,066	317,271	304,430	284,584	322,423	369,433	436,461	492,563	552,771
Bed & Breakfast	74,879	73,415	76,517	67,869	60,122	63,995	75,022	69,297	79,906	81,738
Cruise Ship	255,148	333,787	399,380	168,964	128,066	132,328	126,522	129,209	124,116	137,079
Friends, Relatives	688,942	726,439	732,496	659,843	671,214	697,832	677,118	701,101	701,926	710,464
Rate										
Hotel Occupancy Rate	81.10%	79.60%	45%	70.50%	64.90%	70.70%	73.30%	76.90%	76.60%	77.10%
Average Daily Rate	\$ 166.16	\$ 187.19	\$ 199.96	\$ 201.85	\$ 177.10	\$ 174.84	\$ 189.83	\$ 204.93	\$ 229.90	\$ 242.63
State Avg Mo. Rent Rate (5 yr. est.)					\$ 1,221	\$ 1,260	\$ 1,313	\$ 1,354	\$ 1,380	\$ 1,417
State Avg Mo. Rent Rate (1 yr. est.)	\$ 995	\$ 1,116	\$ 1,194	\$ 1,298	\$ 1,293	\$ 1,291	\$ 1,308	\$ 1,379	\$ 1,414	\$ 1,448

Table B-1. Characteristics of Out-of-State Properties, Hawai'i, 2016

		Location of Property									
		Oahu		Maui		Hawaii		Kauai		Total	
		Number	Pct.	Number	Pct.	Number	Pct.	Number	Pct.	Number	Pct.
Condo	Yes	19,035	73.1%	18,612	87.8%	7,469	44.6%	4,578	58.7%	49,694	69.2%
	No	7,020	26.9%	2,594	12.2%	9,283	55.4%	3,223	41.3%	22,120	30.8%
	Unknown	405		313		107		0		825	
	Total	26,460	100.0%	21,519	100.0%	16,859	100.0%	7,801	100.0%	72,639	100.0%
(Grouped) In what year did you buy this property?	Before 1970	675	2.6%	136	0.6%	267	1.6%	140	1.8%	1,218	1.7%
	1971 to 1990	2,565	9.7%	2,330	10.8%	1,440	8.5%	514	6.6%	6,849	9.4%
	1991 to 2000	2,295	8.7%	1,937	9.0%	1,867	11.1%	1,028	13.2%	7,127	9.8%
	2001 to 2016	13,365	50.5%	11,531	53.6%	9,497	56.3%	4,251	54.5%	38,644	53.2%
	No Data	7,560	28.6%	5,585	26.0%	3,788	22.5%	1,869	24.0%	18,801	25.9%
	Total	26,460	100.0%	21,519	100.0%	16,859	100.0%	7,801	100.0%	72,639	100.0%
Purpose of Property	Primary residence	945	3.6%	318	1.5%	640	3.8%	280	3.6%	2,183	3.0%
	Secondary residence	6,210	23.5%	4,314	20.0%	4,535	26.9%	1,775	22.8%	16,834	23.2%
	Vacation home	5,198	19.6%	9,811	45.6%	4,375	25.9%	2,896	37.1%	22,279	30.7%
	Investment property	12,893	48.7%	6,804	31.6%	6,242	37.0%	2,382	30.5%	28,321	39.0%
	Other	1,215	4.6%	272	1.3%	1,067	6.3%	467	6.0%	3,021	4.2%
	Total	26,460	100.0%	21,519	100.0%	16,859	100.0%	7,801	100.0%	72,639	100.0%
(Grouped) How many bedrooms does this property have?	1 bedroom	9,315	35.2%	8,670	40.3%	1,494	8.9%	1,121	14.4%	20,600	28.4%
	2 bedrooms	8,100	30.6%	8,797	40.9%	4,695	27.8%	3,083	39.5%	24,675	34.0%
	3 bedrooms	5,333	20.2%	2,514	11.7%	5,122	30.4%	1,822	23.4%	14,790	20.4%
	4+ bedrooms	3,240	12.2%	1,282	6.0%	5,442	32.3%	1,682	21.6%	11,645	16.0%
	Not sure	473	1.8%	257	1.2%	107	0.6%	93	1.2%	930	1.3%
	Total	26,460	100.0%	21,519	100.0%	16,859	100.0%	7,801	100.0%	72,639	100.0%
(Grouped) How many bathrooms does this property have?	0/Studio	0	0.0%	0	0.0%	53	0.3%	0	0.0%	53	0.1%
	1 to 1.5 bathroom	11,610	43.9%	7,580	35.2%	1,707	10.1%	1,588	20.4%	22,486	31.0%
	2 to 2.5 bathrooms	11,340	42.9%	11,051	51.4%	7,843	46.5%	3,503	44.9%	33,737	46.4%
	3+ bathrooms	2,970	11.2%	2,423	11.3%	3,414	20.3%	2,242	28.7%	11,049	15.2%
	No data	540	2.0%	465	2.2%	3,841	22.8%	467	6.0%	5,313	7.3%
	Total	26,460	100.0%	21,519	100.0%	16,859	100.0%	7,801	100.0%	72,639	100.0%
(Grouped) When was the last time you visited Hawaii and stayed at your property?	Before year 2000	1,080	4.1%	484	2.3%	213	1.3%	93	1.2%	1,871	2.6%
	2000 to 2005	945	3.6%	182	0.8%	320	1.9%	140	1.8%	1,587	2.2%
	2006 to 2010	1,823	6.9%	545	2.5%	694	4.1%	47	0.6%	3,107	4.3%
	2011 to 2016	17,348	65.6%	19,103	88.8%	12,431	73.7%	6,680	85.6%	55,561	76.5%
	Never stayed there	5,265	19.9%	1,206	5.6%	3,201	19.0%	841	10.8%	10,513	14.5%
	Total	26,460	100.0%	21,519	100.0%	16,859	100.0%	7,801	100.0%	72,639	100.0%

Table B-1: Characteristics of Out-of-State Properties, Hawai'i, 2016 (Countined)

		Location of Property									
		O'ahu		Maui		Hawaii		Kauai		Total	
		Number	Pct.	Number	Pct.	Number	Pct.	Number	Pct.	Number	Pct.
(Grouped) How many trips to Hawaii have you made in the past 5 years?	0 to 5 times	13,230	50.0%	6,956	32.3%	7,576	44.9%	2,429	31.1%	30,191	41.6%
	6 to 10 times	6,143	23.2%	7,591	35.3%	4,748	28.2%	2,803	35.9%	21,284	29.3%
	11 to 15 times	2,700	10.2%	4,535	21.1%	2,134	12.7%	1,308	16.8%	10,677	14.7%
	16+ times	3,308	12.5%	2,120	9.9%	1,814	10.8%	1,074	13.8%	8,316	11.4%
	No Data	1,080	4.1%	318	1.5%	587	3.5%	187	2.4%	2,171	3.0%
	Total	26,460	100.0%	21,519	100.0%	16,859	100.0%	7,801	100.0%	72,639	100.0%
Duration of Typical Trip to Hawai'i	Less than 1 week	2,700	10.5%	802	3.8%	854	5.3%	420	5.5%	4,776	6.8%
	1 to 2 weeks	12,758	49.7%	7,148	33.6%	6,989	43.5%	3,550	46.3%	30,444	43.1%
	2 to 4 weeks	4,455	17.4%	6,478	30.5%	3,468	21.6%	1,962	25.6%	16,363	23.2%
	1 to 2 months	1,688	6.6%	2,754	13.0%	2,027	12.6%	934	12.2%	7,403	10.5%
	2 to 6 months	1,823	7.1%	3,102	14.6%	1,921	12.0%	561	7.3%	7,405	10.5%
	More than 6 months	405	1.6%	227	1.1%	107	0.7%	93	1.2%	832	1.2%
	Varies	1,823	7.1%	741	3.5%	694	4.3%	140	1.8%	3,398	4.8%
	No Data	810		268		800		140		2,018	
Total	26,460	100.0%	21,519	100.0%	16,859	100.0%	7,801	100.0%	72,639	100.0%	
Stays at Property During Visits to Hawaii	Always	11,138	42.1%	15,173	70.5%	8,429	50.0%	5,232	67.1%	39,972	55.0%
	Most of the time	2,903	11.0%	3,158	14.7%	2,241	13.3%	1,028	13.2%	9,329	12.8%
	Once in a while	1,958	7.4%	862	4.0%	854	5.1%	420	5.4%	4,094	5.6%
	Never	10,125	38.3%	2,149	10.0%	4,855	28.8%	981	12.6%	18,109	24.9%
	No data	338	1.3%	177	0.8%	480	2.8%	140	1.8%	1,135	1.6%
	Total	26,460	100.0%	21,519	100.0%	16,859	100.0%	7,801	100.0%	72,639	100.0%
Country of Residence	United States	10,125	89.3%	11,832	83.5%	6,989	91.6%	4,344	93.0%	33,290	88.1%
	Canada	405	3.6%	2,149	15.2%	534	7.0%	327	7.0%	3,414	9.0%
	Japan	608	5.4%	182	1.3%	0	0.0%	0	0.0%	789	2.1%
	China	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	Other	203	1.8%	0	0.0%	107	1.4%	0	0.0%	309	0.8%
	No Data	15,120		7,357		9,230		3,130		34,837	
	Total	26,460	100.0%	21,519	100.0%	16,859	100.0%	7,801	100.0%	72,639	100.0%

Table B-2. Property Management Behaviors of Out-of-State Property Owners, Hawai'i, 2016

		Location of Property									
		Oahu		Maui		Hawaii		Kauai		Total	
		Number	Pct.	Number	Pct.	Number	Pct.	Number	Pct.	Number	Pct.
Property Building Type	single-family house	5,400	20.4%	1,872	8.7%	5,228	31.0%	2,663	34.1%	15,163	20.9%
	unit in a multi-family building	20,655	78.1%	19,198	89.2%	7,683	45.6%	4,765	61.1%	52,300	72.0%
	other	405	1.5%	450	2.1%	3,948	23.4%	374	4.8%	5,176	7.1%
	Total property owners	26,460	100.0%	21,519	100.0%	16,859	100.0%	7,801	100.0%	72,639	100.0%
When the property is not occupied by the owner, the property is...	rented	18,158	68.6%	14,207	66.0%	7,736	45.9%	4,952	63.5%	45,052	62.0%
	vacant	6,413	24.2%	6,862	31.9%	6,829	40.5%	2,242	28.7%	22,346	30.8%
	loaned to family or friends	4,185	15.8%	4,731	22.0%	3,628	21.5%	1,635	21.0%	14,179	19.5%
	used for other purpose	608	2.3%	454	2.1%	1,707	10.1%	514	6.6%	3,282	4.5%
	no data	473	1.8%	268	1.2%	747	4.4%	187	2.4%	1,674	2.3%
	Total	26,460	100.0%	21,519	100.0%	16,859	100.0%	7,801	100.0%	72,639	100.0%
When rented, the property is rented to...	Visitors ^a	3,443	19.0%	7,898	55.6%	3,041	39.6%	2,990	60.4%	17,371	38.6%
	Residents only	9,585	52.8%	2,375	16.7%	2,774	36.1%	1,028	20.8%	15,762	35.0%
	Don't know who rents ^b	5,130	28.3%	3,934	27.7%	1,867	24.3%	934	18.9%	11,865	26.4%
	Does not rent	8,303		7,312		9,176		2,849		27,640	
	Total property owners	26,460	100.0%	21,519	100.0%	16,859	100.0%	7,801	100.0%	72,639	100.0%
Has Rental Program Agreement (an IARA)	Yes	5,670	70.0%	8,715	74.1%	3,468	63.7%	2,663	71.3%	20,515	70.7%
	No	2,430	30.0%	3,041	30.0%	1,974	30.0%	1,074	30.0%	8,520	30.0%
	no response	10,058		2,451		2,294		1,215		16,017	
	Total property renters	18,158	100.0%	14,207	100.0%	7,736	100.0%	4,952	100.0%	45,052	100.0%
Lists Property with a Local Rental Agent	Yes	5,940	63.3%	7,399	57.9%	3,361	56.8%	2,709	65.2%	19,409	60.2%
	No	3,443	30.0%	5,371	30.0%	2,561	30.0%	1,448	30.0%	12,823	30.0%
	no response	8,775		1,437		1,814		794		12,820	
	Total property renters	18,158	100.0%	14,207	100.0%	7,736	100.0%	4,952	100.0%	45,052	100.0%
Property Listed on Online Booking Site	Yes	2,295	23.8%	6,400	49.8%	3,201	53.1%	2,382	56.7%	14,278	43.6%
	No	3,983	41.3%	3,117	24.2%	1,761	29.2%	888	21.1%	9,747	29.8%
	Dont know, agent lists property	3,375	35.0%	3,344	26.0%	1,067	17.7%	934	22.2%	8,720	26.6%
	no response	8,505		1,347		1,707		747		12,306	
	Total property renters	18,158	100.0%	14,207	100.0%	7,736	100.0%	4,952	100.0%	45,052	100.0%
Property Advertised Online	Yes	2,835	30.9%	7,035	55.1%	3,254	52.1%	2,663	64.8%	15,788	48.9%
	No	1,958	21.3%	1,982	15.5%	1,921	30.8%	654	15.9%	6,514	20.2%
	Dont know, agent lists property	4,388	47.8%	3,752	29.4%	1,067	17.1%	794	19.3%	10,001	31.0%
	no response	8,978		1,437		1,494		841		12,750	
	Total property renters	18,158	100.0%	14,207	100.0%	7,736	100.0%	4,952	100.0%	45,052	100.0%

Table B-3. Property Listing Characteristics of Out-of-State Property Owners, Hawai'i, 2016

		Property Building Type							
		single-family house		unit in a multi-family building		other		Total	
		Number	Pct.	Number	Pct.	Number	Pct.	Number	Pct.
Property Advertised Online	Yes	1,633	39.8%	14,011	51.1%	143	38.6%	15,788	49.5%
	No	1,395	34.0%	4,592	16.8%	107	28.8%	6,094	19.1%
	Don't know, agent lists property	1,076	26.2%	8,804	32.1%	121	32.6%	10,001	31.4%
	no response	4,123		8,918		129		13,169	
	Total property renters	8,227	100.0%	36,326	100.0%	500	100.0%	45,052	100.0%
Renter knowledge of property rental details	not sure, agent lists property	1,848	42.7%	18,585	61.9%	188	50.8%	20,621	59.4%
	certain about rent details	2,477	57.3%	11,450	38.1%	182	49.2%	14,109	40.6%
	didn't respond to rent questions	3,902		6,291		130		10,322	
	Total property renters	8,227	100.0%	36,326	100.0%	500	100.0%	45,052	100.0%
Online Booking Sites Used	Property Listed on Airbnb	409	13.7%	2,121	8.8%	0	0.0%	2,531	9.3%
	Property Listed on VRBO	1,306	43.6%	9,081	37.8%	0	0.0%	10,386	38.0%
	Property Listed on FlipKey	47	1.6%	1,777	7.4%	76	23.8%	1,899	6.9%
	Property Listed on ClearStay	0	0.0%	144	0.6%	0	0.0%	144	0.5%
	Property Listed on Other Site	428	14.3%	3,575	14.9%	0	0.0%	4,003	14.6%
	use Trip Advisor	0	0.0%	45	0.2%	0	0.0%	45	0.2%
	use Expedia	0	0.0%	91	0.4%	0	0.0%	91	0.3%
	use Homeaway	47	1.6%	282	1.2%	0	0.0%	328	1.2%
	use Home Escape	0	0.0%	45	0.2%	0	0.0%	45	0.2%
	use Automated Housing Referral Network	68	2.3%	135	0.6%	0	0.0%	203	0.7%
	use Outrigger	0	0.0%	91	0.4%	0	0.0%	91	0.3%
	use CRH - Maui Kamaole	0	0.0%	45	0.2%	0	0.0%	45	0.2%
	use Aloha Condos	0	0.0%	139	0.6%	0	0.0%	139	0.5%
	use Castle Resorts	0	0.0%	92	0.4%	0	0.0%	92	0.3%
	use Chase N Rainbows	0	0.0%	45	0.2%	0	0.0%	45	0.2%
	use Vay Cay Hero	0	0.0%	53	0.2%	0	0.0%	53	0.2%
	use Vacant Land	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	use Lodgify	0	0.0%	53	0.2%	0	0.0%	53	0.2%
	use Kauai Calls	0	0.0%	114	0.5%	0	0.0%	114	0.4%
	use non-Internet booking sites	474	15.8%	1,150	4.8%	53	16.8%	1,678	6.1%
	Total responses given	2,778	100.0%	19,079	100.0%	129	100.0%	21,986	100.0%
	Total owners responding	1,627		12,576		76		14,278	
Avg. sites identified	1.7		1.5		1.7		1.5		

Table B-4. Occupancy Rate Data from Out-of-State Property Owners, Hawai'i, 2016

		Property Building Type							
		single-family house		unit in a multi-family building		other		Total	
		Number	Pct.	Number	Pct.	Number	Pct.	Number	Pct.
Occupancy Rate Status	Has occupancy rate	1,652	10.9%	14,761	28.2%	129	2.5%	16,542	22.8%
	Insufficient data	288	1.9%	1,006	1.9%	0	0.0%	1,294	1.8%
	Does not rent	6,936	45.7%	16,028	30.6%	4,677	90.3%	27,640	38.1%
	Unknown	6,287	41.5%	20,505	39.2%	371	7.2%	27,163	37.4%
	Total	15,163	100.0%	52,300	100.0%	5,176	100.0%	72,639	100.0%
Grouped Occupancy Rate	>=0 and <=0.25	228	13.8%	1,025	6.9%	53	41.3%	1,306	7.9%
	>0.25 and <=0.5	407	24.6%	2,691	18.2%	76	58.7%	3,173	19.2%
	>0.5 and <=0.75	374	22.7%	4,772	32.3%	0	0.0%	5,146	31.1%
	>0.75 and <=0.85	208	12.6%	3,135	21.2%	0	0.0%	3,342	20.2%
	>0.85 and <=1	435	26.3%	3,139	21.3%	0	0.0%	3,574	21.6%
	Total	1,652	100.0%	14,761	100.0%	129	100.0%	16,542	100.0%

B. METHODOLOGY

1. Out-of-State Property Owner Survey

The Survey of Out-of-State Property Owners was a mailed survey delivered to a simple random sample of property owners whose billing addresses were outside the State of Hawai'i. The study was conducted in summer of 2016.

Instrument

The survey instrument was developed by the SMS Research staff in conjunction with the project team at the Hawai'i Tourism Authority.

Research objectives included the following to:

1. Confirm that a respondent currently owns property in the State of Hawai'i;
2. Identify the island on which the property is located;
3. Identify the type of property owned by each respondent (developed residential land, undeveloped residential land, commercial property, etc.);
4. Identify whether there is a residential unit on the property and the characteristics of the unit (e.g., age of unit, number of bedrooms, number of bathrooms);
5. Understand the primary function of a residential unit (e.g., primary residence, vacation home, rental/investment property);
6. Identify whether the unit is rented when the unit is not in use by the owner and two whom a property is rented (e.g., Hawai'i residents, visitors, military personnel);
7. Understand for properties that are rented to visitors, whether the property is managed by a local property manager, the methods by which the property is advertised, and whether the owner or authorized agent of the owner lists the property as an individually advertised unit on any online booking sites

Sample

A file of 72,640 records of persons who own property in Hawai'i and whose tax identification numbers are associated with an out-of-state address was obtained from a third party vendor. The file of owners was de-duplicated by name and address of the property owner. From the de-duplicated file, a sample of 5,000 records was randomly drawn to be recipients of the survey.

Following the fielding of the survey to the first 5,000 recipients, preliminary analyses indicated an underrepresentation of persons in the sample who live outside the United States. Subsequently, an additional wave of surveys were sent to 100% of persons who responded to the 2014 Visitor Satisfaction and Activity Survey (VSAT) who indicated living in either Japan or Canada and who indicated that at the time they completed the VSAT they either owned or planned to own residential property in the State of Hawai'i. In total, an additional 426 surveys were sent to respondents in Japan and 362 surveys were sent to respondents in Canada.

Fielding

The first wave of surveys was distributed to the random sample of out-of-state owners on April 19, 2016. Respondents received a packet in the mail that contained the survey, a cover letter drafted by SMS and approved by HTA, and a postage-paid business reply envelope that respondents could send back the survey to the SMS processing center in Downtown Honolulu.

The cover letter, included with the survey, also provided respondents an option of completing the survey online. The online survey was programmed by SMS Research staff and was identical in content to the printed survey sent in the mail. In order to access the survey, respondents entered a password provided to them in the cover letter. The password corresponded to a pre-assigned unique identification number associated with each survey. The use of unique ID numbers as passwords allowed for the checking for and removal of duplicate surveys.

The second wave of surveys based on VSAT respondents was mailed on June 21, 2016. The VSAT sample was also provided the option to complete the survey online. SMS processing continued to scan and verify surveys through the month of July 2016.

Across both waves of fielding a total of 1,348 surveys were returned from out of state property owners, resulting in a response rate of 23.2%. The file was weighted to the by-island distribution of the location of properties in the original file from which the 5,000 sample records were originally drawn.

Data Scanning and Verification

Following the receipt of surveys at the SMS data processing center, scanning staff logged the number

of surveys received each day, then scanned the surveys using optical scanners fitted with software called TELEForm which converts markings on the survey form into the data. SMS staff verifies and examines scanned data to correctly code any data that TELEForm flagged as ambiguous. Scanning staff also verify 100% of all handwritten data to ensure accurate recording of open-ended responses. Note that there were a number of surveys returned for which respondents did not indicate a country of residence. For these surveys SMS replaced the blank response with the country included in the mailing address of the survey.

2. Housing Demand Survey

This study was conducted as an update to the Hawai'i Housing Policy Study, 2011. The research design was developed to match past survey content, sampling method, data collection, and data processing procedures as closely as possible.

Method

SMS Research designed the survey instrument with input from the Hawai'i Housing Finance and Development Corporation (HHFDC), County Housing Agencies, the Department of Hawaiian Home Lands, and private sector housing interests across the state. The reviewers suggested several changes in content, and most of those changes were incorporated in the final survey instrument. The final version of the survey instrument is shown in the Appendix A.

Each County was divided into several sub-areas for the survey. These geographic survey areas may not correspond exactly to those used in previous iterations of the HHPS, but are very similar. The sample sizes for the geographic subdivisions survey were sufficient to produce results that are statistically accurate within plus-or-minus five percentage points at the 95 percent confidence level.

Thirty pre-test surveys were conducted among Hawai'i households using the same methodology as were employed for the actual survey. The purpose of the pre-test was to determine whether survey items were understandable to the general public, included the most appropriate response options, and were arranged in the proper order for effective inquiry. Some minor changes to the survey content were made as a result of the pretest.

Sampling

The target population for this survey included all residents of the State of Hawai'i residing in non-institutionalized housing units with working telephone or internet service at the time of the study. The sample design was a multi-frame design in which independent samples were selected from three different sampling frames representing the same population. In this case the three frames were the list of landline telephone numbers, the list of wireless telephone (cell phone) numbers, and the list of consumers with a working internet connection active at the time of the survey.

Three independent samples with identical designs were selected, one from each frame. The samples were both random digit dialing (RDD), disproportionate across geographic area and random within areas. In the case of the landline sample, independent samples were selected for each of the required geographic areas (see below). The frame was the SMS RDD sample selection system which permits disproportionate sampling by telephone exchange.

The landline sampling frame was stratified by geography comparable to districts selected by each county agency participating in the study. The number of districts varied from one county to another. District boundaries were defined by zip codes or groups of zip codes. Zip code groupings were determined based on the instructions from each of the Counties. The areas comprising the districts in each county are reported in the next section of this report.

The wireless sampling frame was stratified by county only. At the present time, this frame cannot be meaningfully stratified at any lower level due to the constant proliferation of cell phone prefixes and that cell phone prefixes are not associated with the address of the consumer but rather the wireless carrier who sold the phone. Cell phone respondents were classified into the same districts as were landline respondents using respondent-provided zip code data from the survey.

The internet sampling frame was also stratified by county only. Respondents were obtained through panels of online survey respondents about whom panel companies have several pieces of information including county of residence. Generally, panels in Hawai'i are not large enough to stratify by any level lower than county, so again, respondent-provided zip code data were used to classify online respondents into districts.

The number of households in each district in 2016 was estimated by SMS Research and sample sizes were selected to produce standard errors of the proportion of plus-or-minus five percentage points at the 95 percent confidence level, with $p = .05$. The sample design is shown in Table 1 on the following page.

Interviewer Selection and Training

Surveys collected from respondents in either landline or cell phone sampling frames were conducted as telephone interviews. SMS Research was responsible for the selection, training, and supervision of all interviewers assigned to this project. Regardless of background or experience, all interviewers were specially trained to conduct the housing survey interviews. The training session included: a review of general telephone interviewing procedures; a question-by-question review of the survey instrument; on-screen CATI training; and a question-and-answer session to make sure that interviewers had all problems handled before beginning work on the survey. During the fielding of the survey, there were frequent, short debriefing sessions in which interviewers could bring up any additional questions or issues and have them addressed by the project manager.

Data Collection

Survey data were collected by phone from October 2015 through April 2016. All interviews were conducted from the SMS Honolulu Calling Center. The Calling Center is equipped with a computer assisted telephone interviewing (CATI) system that was used for this project. The system provides for rigorous control of sampling, disposition of all calls dialed, and survey administration. Calls were placed between the hours of 1:00 PM and 9:00 PM on weekdays and 10:00 AM and 7:00 PM on weekends. An unlimited callback procedure was employed. In practice, some numbers were re-dialed as many as eight times in order to complete interviews.

At least one supervisor was present at all times during the fielding process and was responsible for monitoring calls. Interviews were monitored on a rotating basis through the CATI system and neither the interviewer nor the caller is aware that monitoring is taking place. Monitors follow the course of the interview and watch the choices being recorded as the respondent answers. If any deviation from procedures is noted, the call monitor conducts a short

re-training session with the interviewer to assure that inter-coder reliability is maintained.

Data Processing

Following the fielding process, data files are reviewed and edited for internal consistency and other possible errors. Edited data are then coded by trained research staff members who assign numeric codes to open-ended items, and sort and check verbatim responses.

Weighting and Balancing of Demand Survey Data

An analysis was conducted to identify any serious non-response bias in the demand survey data. Disproportionate coverage for several demographic variables was noted, especially in the cell phone surveys.

Following the procedures developed by The Centers for Disease Control for the Behavioral Risk Factors Surveillance System, with some adaptations based on the weighting procedure applied at Pew Research, SMS has developed a weighting system for multi-frame sample surveys in Hawai'i. The weighting has three components as shown below.

1. **Sample Weights:** The disproportionate sample design sought equal precision by district, but resulted in an unbalanced sample across districts. Sample weights were designed to statistically adjust survey results for a disproportionate design by weighting survey results to the distribution of the populations from which each county sample was drawn. Weights were constructed by dividing the population estimates by the sample counts on a cell-by-cell basis. This procedure is the same as the weighting procedure used in previous Housing Planning Study Demand Surveys.
2. **Sample Raking:** The weighting scheme for the housing demand survey in 2016 must also account for multi-frame sampling (a difference in telephone and Internet service available to each household) and the heavier non-sampling error associated with multi-frame sample surveys involving cell phones.

Table A-1. Demand Survey Sample Results, 2016

Geographic Area	Households 2015	Household Sample		Modes		
		Sample Size ^a	Margin of Error	Landline	Cell Phone	Online
Total	462,876	5,800	1.28	1,008	3,353	1,439
City & County of Honolulu	317,459	1,937	2.22	389	708	840
Primary Urban Center	161,214	465	4.54	63	127	275
Central O'ahu	38,278	473	4.48	162	154	157
East Honolulu	17,666	174	7.39	9	90	75
Ko'olaupoko	36,169	249	6.19	61	76	112
Ko'olauloa	3,688	39	15.61	11	17	11
North Shore O'ahu	18,408	133	8.47	26	50	57
Wai'anae	11,666	141	8.20	35	65	41
'Ewa	30,370	255	6.11	20	125	110
District Unknown	-	8	-	2	4	2
County of Maui	55,509	1,584	2.43	285	1,086	213
Hāna	542	27	18.40	11	16	0
Makawao-Pukalani-Kula	9,729	298	5.59	26	228	44
Wailuku-Kahului	17,060	434	4.64	31	321	82
Paia-Haiku	4,755	163	7.54	51	101	11
Kīhei-Mākena	11,371	235	6.33	12	188	35
West Maui	7,850	208	6.70	39	149	20
Island of Moloka'i	2,568	120	8.74	64	39	17
Island of Lāna'i	1,183	90	9.93	49	37	4
District Unknown	-	9	-	2	7	0
County of Hawai'i	66,989	1,065	2.98	143	629	293
South Kona – Ka'ū	8,165	119	8.92	38	56	25
Puna	15,386	170	7.47	17	100	53
North & South Hilo	19,051	332	5.33	42	191	99
North Hawai'i	10,203	174	7.37	26	107	41
North Kona	14,184	260	6.02	20	166	74
District Unknown	-	10	-	0	9	1
County of Kaua'i	23,369	1,213	2.74	191	929	93
Waimea-Kekaha	2,916	164	7.44	45	108	11
Kōloa-Po'ipū	2,333	252	5.83	60	176	16
Līhu'e	4,931	224	6.40	4	199	21
Kapa'a-Wailua	7,500	332	5.26	17	290	25
North Shore Kaua'i	2,888	162	7.48	45	105	12
Hanapēpē-'Ele'ele	2,802	75	11.17	20	47	8
District Unknown	-	4	-	0	4	0

Note: ^a One case has been excluded at the county level due to the refusal of reporting county residence.

Since the exact number of households by type of phone and Internet service, household size, home ownership, and age of respondents, etc., was unknown, the standard methods of post-stratification (statistical adjustment for non-sample error) would not work. The solution was to use one of several methods of sample balancing, or raking as it is better known these days. The method begins with sample weights applied as noted above, and then balances the sample for type of communications service (landline only, landline-cell, landline-Internet, landline-cell-Internet, cell-Internet, and cell only). In the same procedure survey data were simultaneously balanced for disproportionality in other raking variables including: age of respondent, household size, homeownership, phone and Internet service availability, and ethnicity.

3. **Replicated Weights:** Replication-based weights have been developed to adjust for variance distortion resulting from to complex sample designs. They are required to adjust sample variances used for statistical tests and certain forms of multivariate analysis. Using the replicated weights, users can estimate standard errors for simple estimators like totals or complicated ones like logistic regression parameter estimates. We did not develop replication weights for this dataset. Replication weights can be supplied upon request from survey sponsors.

Sample weights and raked weights were applied in all tabulations developed for and all analyses conducted based on demand survey data. This weighting was necessary to statistically adjust housing demand survey so that the data accurately represent the number of households by district, the size of household, number of children in the household, unit tenure, marital status, age of respondent, as well as landline and cell phone usage.