

Population and Economic Projections for the State of Hawaii to 2045

June 2018

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Department of Business, Economic Development
and Tourism
STATE of HAWAII**



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This report presents the results and methodology of the 2045 Series of the DBEDT Population and Economic Projections for the State of Hawaii and its four counties. This is the ninth in a series of long-range projections dating back to the first report published in 1978. The 2045 Series uses the detailed population characteristics from the 2010 Decennial Census, 2016 vintage intercensal population estimates by the U.S. Census Bureau, 2016 estimates of economic variables, and input-output (I-O) tables based on the 2012 Economic Census as baseline data for the projection.

It should be noted that these projections are neither targets nor goals. They are DBEDT's best estimates of likely trends in important population and economic variables based on currently available information. The accuracy of these projections depends on the degree to which historical trends provide guides to the future, changing external conditions, infrastructure capacity, and other supply constraints which have not been incorporated into the model.

Section 1 of this report summarizes the population and economic projections for the state and counties. Section 2 describes the methodology and assumptions that were used to produce the projections. The appendix tables contain detailed projections.

I. Summary of Projections

1. Population

The resident population of Hawaii, which includes active-duty military personnel and their dependents as well as other civilian population, is projected to increase from 1.43 million in 2016 to 1.65 million in 2045, an average growth rate of 0.5 percent per year over the projection period.

The size of military population in Hawaii has been determined mostly as the result of national defense consideration. Without a clear known direction of the future level of military personnel in Hawaii this projection was produced based on the assumption that the size of military population in Hawaii will stay at its past five-year average as it has been at a stable level in the past five years.

The size and composition of other civilian population were determined by three components: births, deaths, and net migration. Net-migration to other civilian population was assumed to remain at 4,800 per year during the projection period, which was the average size of net-migration added to other civilian population annually during the 1980-2016 period. Natural population increase (i.e., total births minus total deaths) has been decreasing due to population aging. This trend is expected to continue in the future resulting in population growing at a moderate and diminishing rate over the projection period. The methodology and detailed

discussion on the assumptions made on fertility, mortality, and migration are included in the methodology section.

Table 1- 1 presents the projection of total resident population by county. As has been the case in the previous DBEDT long-range projections, the Neighbor Island counties are projected to have higher population growth than Honolulu County during the projection period. The resident population of Honolulu County is projected to grow at an annual rate of 0.3 percent during the 2016 to 2045 period, while Hawaii County is projected to grow at 1.1 percent, Maui County at 0.9 percent, and Kauai County at 0.8 percent annually respectively.

The combined share of three neighbor islands in total Hawaii population has increased from 21.1 percent in 1980 to 30.5 percent in 2016. It was the result of faster population growths observed in the neighbor islands in the past decades. The population share of the neighbor islands are projected to further increase to 34.9 percent by 2045 as the faster population growths in the neighbor islands are projected to continue during the projection period.

Table 1- 1. Resident Population by County: 1980-2045

Year	State Total	Hawaii County	Honolulu County	Kauai County	Maui County
1980 ¹	968,500	92,900	764,600	39,400	71,600
1990 ¹	1,113,491	121,572	838,534	51,676	101,709
2000 ¹	1,213,519	149,244	876,629	58,568	129,078
2010 ¹	1,363,621	185,406	955,775	67,226	155,214
2016 ¹	1,428,557	198,449	992,605	72,029	165,474
2025 ²	1,514,700	222,400	1,032,700	78,000	181,600
2035 ²	1,592,700	248,500	1,062,100	84,300	197,800
2045 ²	1,648,600	273,200	1,073,800	90,000	211,500
Average annual growth rate (%)					
1980-1990	1.4	2.7	0.9	2.7	3.6
1990-2000	0.9	2.1	0.4	1.3	2.4
2000-2010	1.2	2.2	0.9	1.4	1.9
2010-2016	0.8	1.1	0.6	1.2	1.1
2016-2025	0.7	1.3	0.4	0.9	1.0
2025-2035	0.5	1.1	0.3	0.8	0.9
2035-2045	0.3	1.0	0.1	0.7	0.7

¹ July estimates by the U.S. Census Bureau

² DBEDT projections, figures presented here can be different from those in the appendix tables because of rounding.

Due to the important role of tourism in the state of Hawaii De Facto population, which counts those who physically present in a given area at a given time, is often served as a more useful

measure for planning purpose. De Facto population can be calculated from resident population by adding visitors who stayed in the area and subtracting residents who were temporarily away from home in a typical day of the year. In 2016, De Facto population was estimated 11 percent higher than resident population statewide. However, the difference varied significantly by county. De Facto population was more than 30 percent higher than resident population in Maui and Kauai County while it was 5.7 percent and 12.1 percent higher in Honolulu and Hawaii County respectively. For the future years, De Facto population is projected to grow slightly faster than resident population in all counties mainly due to tourism projected to grow faster than population growth over the projection period.

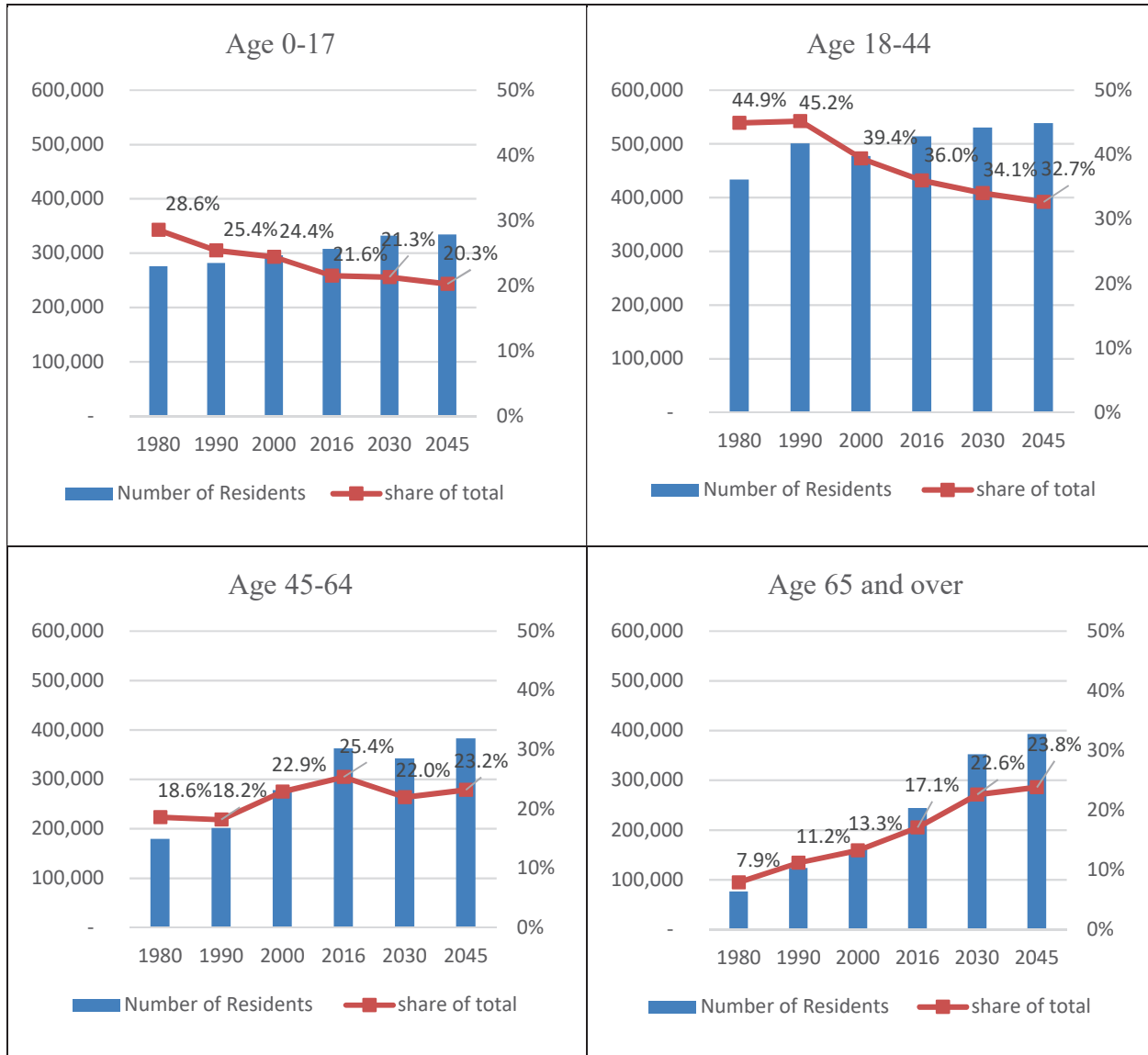
Table 1- 2. De Facto Population by County: 1980-2045

Year	State Total	Hawaii County	Honolulu County	Kauai County	Maui County
1980	1,054,218	99,181	822,408	46,341	86,288
1990	1,257,319	137,103	913,268	68,558	138,390
2000	1,336,005	166,429	926,192	74,734	168,650
2010	1,468,677	202,682	988,095	83,516	194,384
2016	1,583,139	222,485	1,048,965	93,630	218,059
2025 ¹	1,695,200	252,100	1,094,000	103,800	245,300
2035 ¹	1,792,100	282,600	1,125,900	113,100	270,500
2045 ¹	1,866,500	311,900	1,139,400	121,800	293,300
Average annual growth rate (%)					
1980-1990	1.8	3.3	1.1	4.0	4.8
1990-2000	0.6	2.0	0.1	0.9	2.0
2000-2010	1.0	2.0	0.6	1.1	1.4
2010-2016	1.3	1.6	1.0	1.9	1.9
2016-2025	0.8	1.4	0.5	1.1	1.3
2025-2035	0.6	1.1	0.3	0.9	1.0
2035-2045	0.4	1.0	0.1	0.7	0.8

¹ DBEDT projections, figures presented here can be different from those in the appendix tables because of rounding.

Population aging is one of the most prominent features of Hawaii's population trend. Increasing its size by 3.3 percent annually on average, the share of elderly population, aged 65 years and over, of Hawaii total population increased from 7.9 percent in 1980 to 17.1 percent in 2016. The fast growth in the elderly population is expected to continue until around 2030 when the age group will start to slow down its growth. By 2045, the share of elderly population is projected to increase to 23.8 percent. All other age groups will also grow over the projection period, but their shares of total population will diminish over time.

Figure 1- 1. Resident Population by Major Age Group: 1980 to 2045



Dependency ratio can be calculated to measure the burden on productive population in an economy. By comparing the size of dependent population (children aged between 0 and 17 and elderly population aged 65 and over) to the size of active working-age population (people aged 18-64), total dependency ratio provides a rough indicator of the burden on the working population in the economy. Another useful measure of dependency is old age dependency ratio, which is calculated by dividing the elderly population (65 and over) by the working age population (aged 18-64). Figure 1- 2 presents these two most widely used dependency ratios. Compared to the U.S. average, in 2016, total dependency ratio of Hawaii was 1.6 percentage point higher while old-age dependency ratio was 3.2 percentage point higher. As presented in Figure 1- 2, both dependency ratios in Hawaii are projected to increase until around 2035 before they level off.

Figure 1- 2. Dependency Ratios: Historical Trend and Projection

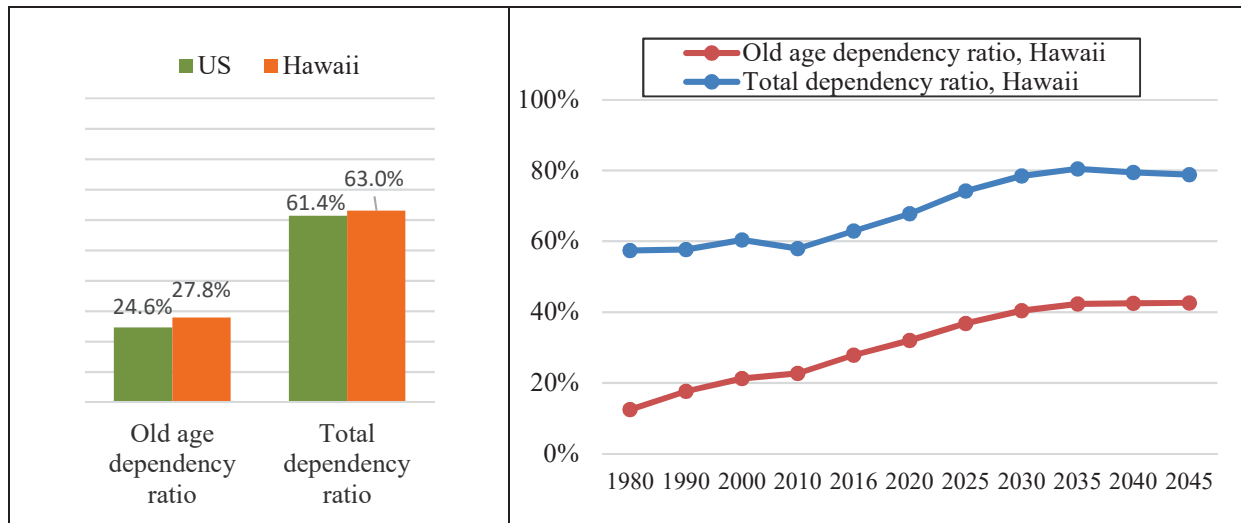


Figure 1- 4 in the next page compares age structure of the population in Hawaii from 1980 to 2045 by 5 age group and by gender. Rapid growth is expected especially in the population group aged 75 years and over, and the aging of population will be more evident in female population. Aging within the elderly population is another phenomenon that will be clearly observed in the future years. In 2016, more than a half of the elderly population (aged 65 years and over) was in the 65-74 age range while 15.6 percent was in “85 and over”. By 2045, the share of the population aged 65-74 is projected to decrease to 38.4 percent of total elderly population while the population aged 85 years and over is projected to increase its share to 27.4 percent.

Projections of population for the state of Hawaii and its four counties are presented by selected characteristics and by five-year age groups in Appendix Tables A-2 through A-21.

Figure 1- 3. Projected Age Composition of Elderly Population in Hawaii: 2010-2045

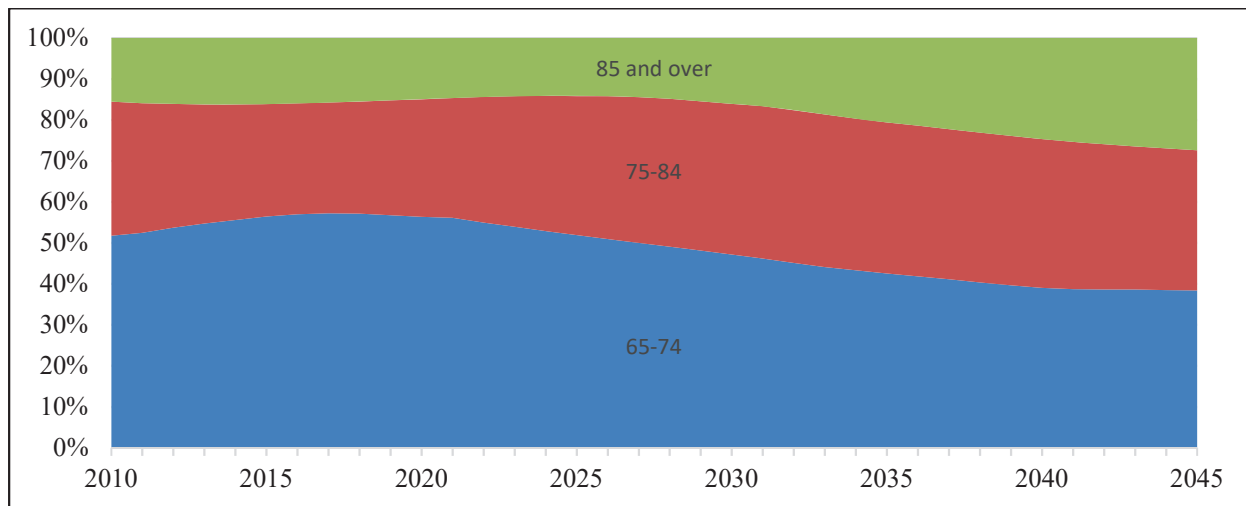
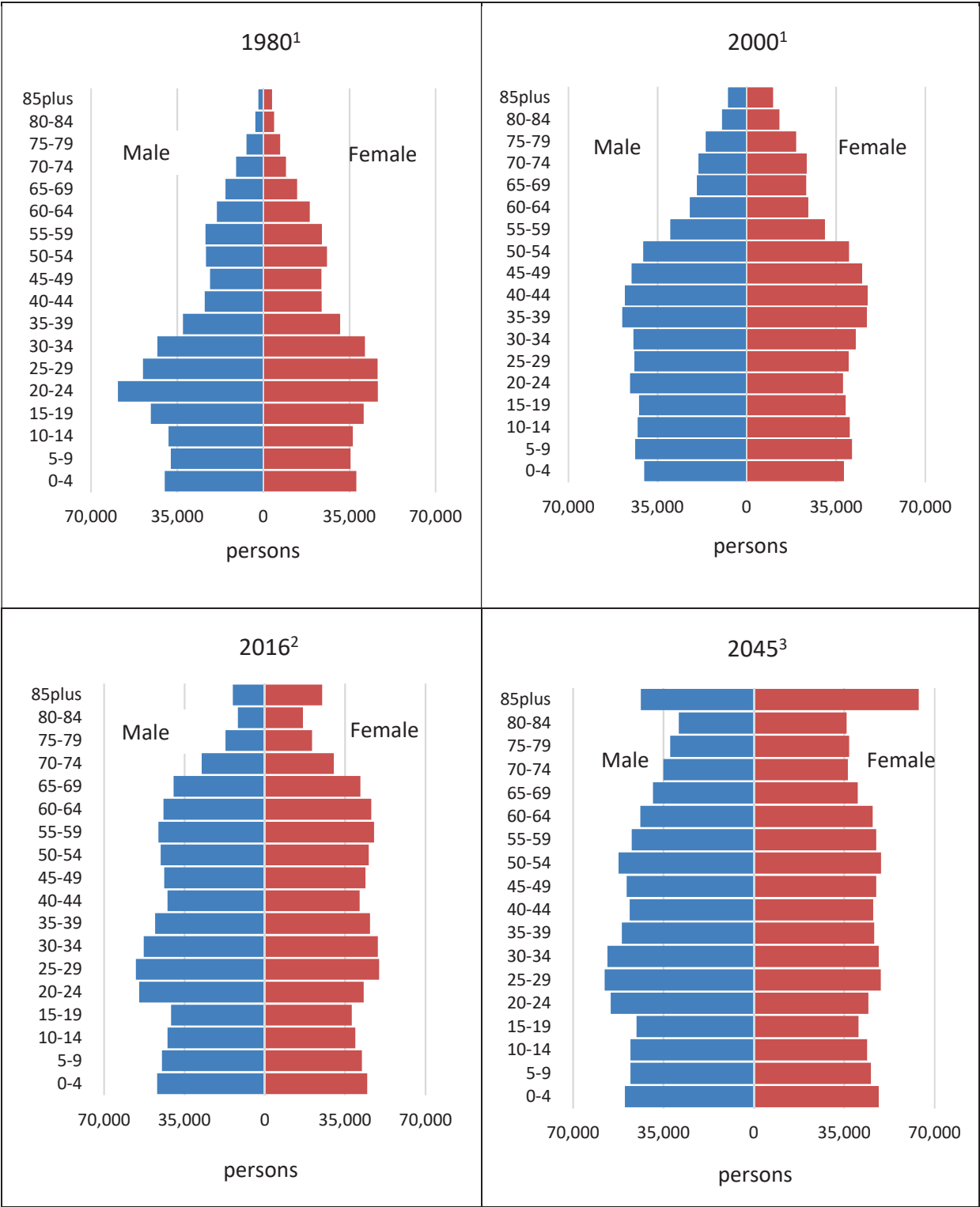


Figure 1- 4. Age Distribution of Resident Population in Hawaii: 1980 to 2045



¹ Source: 1980, 2000 Decennial Census, U.S. Census Bureau

² Source: Estimates by U.S. Census Bureau

³ DBEDT projections

2. Gross Domestic Product and Personal Income

The Hawaii economy growth is expected to be gradual over the coming decades. The prospects for more rapid growth is limited by the structural factor of an aging population. Projections of gross domestic product (GDP) and personal income are summarized in Table 1- 3 and Table 1- 4.

The real gross domestic product of Hawaii is forecast to grow at 1.7 percent per year over the projection period. The growth of GDP depends on demand from outside the region as well as local consumption and investment. Demand from outside the region is assumed exogenously as it is determined by factors that are difficult to incorporate in the model.

Table 1- 3. Projections of Real GDP

Real GDP (State total, in millions of 2012 dollars)						
2016	2020	2025	2030	2035	2040	2045
80,300	86,500	94,700	103,600	112,500	121,700	131,500
Average Annual Growth Rate						
2016-2020	2020-2025	2025-2030	2030-2035	2035-2040	2040-2045	
1.9%	1.8%	1.8%	1.7%	1.6%	1.6%	

This projection takes into accounts the slowdown in construction activities. After a few years' expansion, both the private building authorization and government contracts awarded have recently been decreasing. The projection also anticipates an overall reduction in the long-term growth of investment, leading to a forecast of a moderate GDP growth.

Another factor that contributes to the moderate level of GDP growth is an anticipation of slow tourism growth. As presented in the tourism section and Table A-60 in the Appendix, tourism expenditures are projected to grow at lower than one percent annually in real terms on average for the period of 2016-2045.

Hawaii's total personal income is forecast to grow at an annual rate of 1.96 percent in real terms over the projection period. With a growing population, per capita personal income will grow at a lower rate than that of total personal income. In particular, the Neighbor Islands are expected to experience relatively low growth of per capita personal income as a result of higher rates of population growth.

Among the components of personal income, transfer payments are expected to grow at a faster rate than other components because of increased retirement incomes of the aging population. As a result, the share of transfer payments to total personal income is projected to increase from 15.7 percent in 2016 to 20.5 percent in 2045, while the share of labor income, the largest component of personal income, is projected to decrease from 71.2 percent in 2016 to 65.9 percent in 2045.

Detailed historical series and projections of personal income are reported in Appendix Tables A-49 through A-54.

Figure 1- 5. Average Annual Growth of Real Personal Income for the State

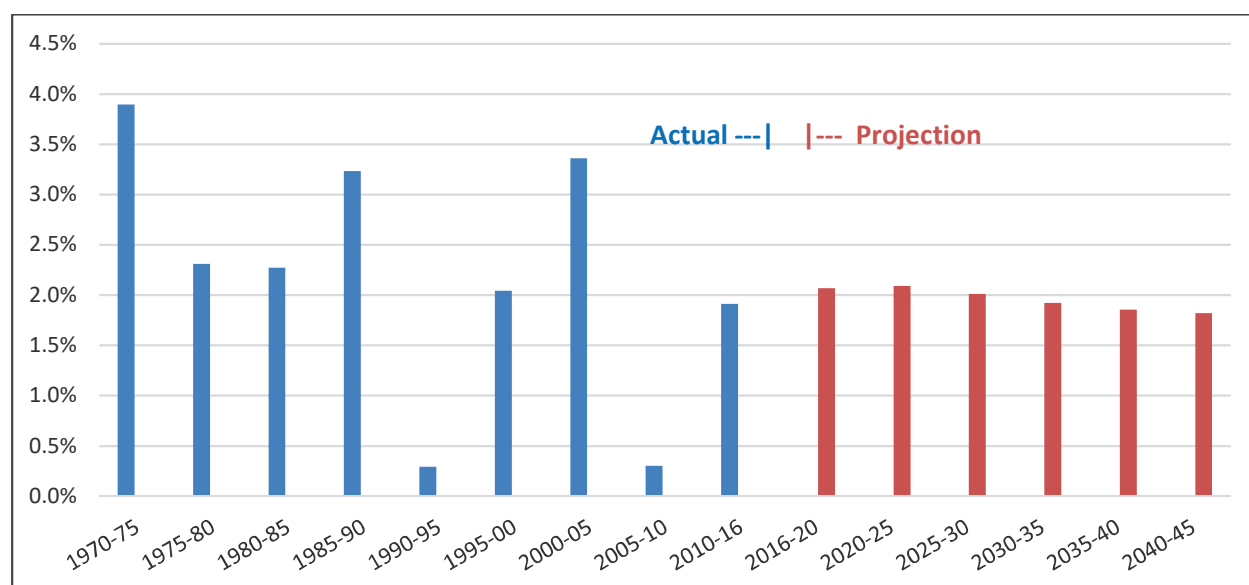


Table 1- 4. Actual and Projected Personal Income (in millions of 2012 dollars)

	1985 ¹	1995 ¹	2005 ¹	2016 ¹	2025 ²	2035 ²	2045 ²
State Total	38,434	45,675	59,557	67,659	81,430	98,940	118,680
Hawaii County	2,868	3,893	6,094	7,165	9,120	11,820	15,010
Honolulu County	31,656	36,035	45,002	50,620	59,970	71,430	83,860
Kauai County	1,275	1,870	2,545	2,952	3,660	4,600	5,770
Maui County	2,635	3,877	5,915	6,921	8,680	11,100	14,050
Average Annual Growth Rate							
	1985-95	1995-05	2005-16	2016-25	2025-35	2035-45	
State Total	1.7%	2.7%	1.2%	2.1%	2.0%	1.8%	
Hawaii County	3.1%	4.6%	1.5%	2.7%	2.6%	2.4%	
Honolulu County	1.3%	2.2%	1.1%	1.9%	1.8%	1.6%	
Kauai County	3.9%	3.1%	1.4%	2.4%	2.3%	2.3%	
Maui County	3.9%	4.3%	1.4%	2.5%	2.5%	2.4%	

¹ Actual figure, source: U.S. Bureau of Economic Analysis (BEA)

² DBEDT projections.

3. Jobs and Employment

Total civilian wage and salary jobs in Hawaii are expected to increase from 666,998 in 2016 to 784,400 in 2045, an average annual growth of 0.56 percent throughout the forecast period. Total jobs (wage and salary jobs plus self-employed jobs) are projected to have a higher growth rate than that of wage and salary jobs, from 857,951 in 2016 to 1,066,000 in 2045, an average annual growth of 0.75 percent over the projection period.

The higher growth rate of projected total jobs is due to a faster growth projected for self-employed jobs than wage and salary jobs. For the period from 1985 to 2016, self-employed jobs have achieved 3.0 percent annual growth on average, while the average annual growth of wage and salary jobs for the period was 1.3 percent. As a result, the statewide share of self-employed jobs to total jobs increased from 14.4 percent in 1985 to 22.3 percent in 2016. This trend is expected to continue in the future, but at a more moderate rate than observed in the past.

Jobs in the Neighbor Islands have increased at a faster rate than in Honolulu in the past. This trend is expected to continue over the projection period, increasing the Neighbor Island's share of statewide total jobs from 29.6 percent in 2016 to 32.6 percent in 2045. County job projections by industry are provided in Appendix Tables A-34 through A-48.

Figure 1- 6. Average Annual Growth of Total Civilian Jobs for the State

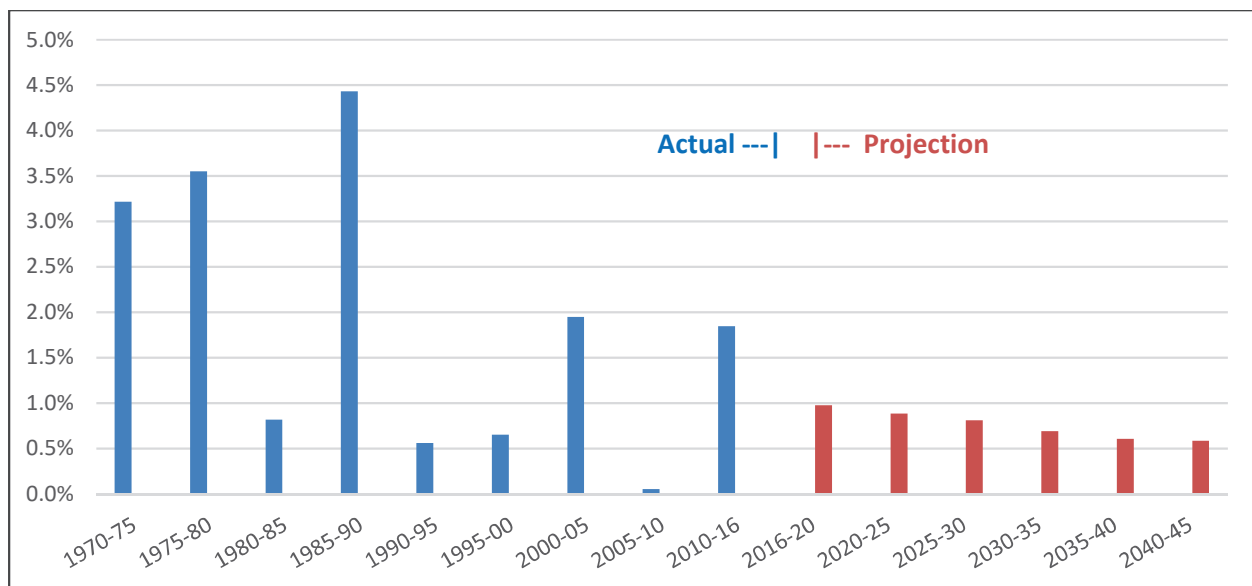


Table 1- 5. Actual and Projected Civilian Jobs

	1985 ¹	1995 ¹	2005 ¹	2016 ²	2025 ³	2035 ³	2045 ³
State Total							
Total Jobs	529,042	675,401	768,002	857,951	932,100	1,004,500	1,066,000
W&S Jobs	452,701	553,046	622,148	666,998	711,600	752,700	784,400
Self-employed Jobs	76,341	122,355	145,854	190,953	220,400	251,800	281,700
Hawaii County							
Total Jobs	48,228	69,019	94,198	102,500	116,600	132,300	147,700
W&S Jobs	37,082	51,020	68,133	70,800	78,600	87,200	95,500
Self-employed Jobs	11,146	17,999	26,065	31,700	38,000	45,100	52,200
Honolulu County							
Total Jobs	410,639	500,790	538,321	604,300	648,300	688,000	718,000
W&S Jobs	357,125	418,773	450,793	487,100	514,400	537,200	551,800
Self-employed Jobs	53,514	82,017	87,528	117,200	133,900	150,900	166,200
Kauai County							
Total Jobs	22,967	32,586	40,399	44,400	48,900	53,600	58,200
W&S Jobs	19,020	25,473	30,594	31,700	34,200	36,800	39,100
Self-employed Jobs	3,947	7,113	9,805	12,700	14,700	16,800	19,100
Maui County							
Total Jobs	47,208	73,006	95,084	106,700	118,300	130,600	142,100
W&S Jobs	39,474	57,780	72,628	77,400	84,400	91,600	98,000
Self-employed Jobs	7,734	15,226	22,456	29,300	33,900	39,000	44,100
Average Annual Growth Rate							
	1985-95	1995-05	2005-16	2016-25	2025-35	2035-45	
State Total							
Total Jobs	2.5%	1.3%	1.0%	0.9%	0.8%	0.6%	
W&S Jobs	2.0%	1.2%	0.6%	0.7%	0.6%	0.4%	
Self-employed Jobs	4.8%	1.8%	2.5%	1.6%	1.3%	1.1%	
Hawaii County							
Total Jobs	3.6%	3.2%	0.8%	1.4%	1.3%	1.1%	
W&S Jobs	3.2%	2.9%	0.3%	1.2%	1.0%	0.9%	
Self-employed Jobs	4.9%	3.8%	1.8%	2.0%	1.7%	1.5%	
Honolulu County							
Total Jobs	2.0%	0.7%	1.1%	0.8%	0.6%	0.4%	
W&S Jobs	1.6%	0.7%	0.7%	0.6%	0.4%	0.3%	
Self-employed Jobs	4.4%	0.7%	2.7%	1.5%	1.2%	1.0%	
Kauai County							
Total Jobs	3.6%	2.2%	0.9%	1.1%	0.9%	0.8%	
W&S Jobs	3.0%	1.8%	0.3%	0.8%	0.7%	0.6%	
Self-employed Jobs	6.1%	3.3%	2.4%	1.6%	1.3%	1.3%	
Maui County							
Total Jobs	4.5%	2.7%	1.1%	1.2%	1.0%	0.8%	
W&S Jobs	3.9%	2.3%	0.6%	1.0%	0.8%	0.7%	
Self-employed Jobs	7.0%	4.0%	2.4%	1.6%	1.4%	1.2%	

¹ Actual figure, source: U.S. Bureau of Economic Analysis (BEA)² County figures for 2016 are DBEDT projections, while state figures for 2016 are from the BEA.³ DBEDT projections, figures can be different from those in the appendix tables because of rounding.

Due to multiple job holders, the number of employed has been lower than the number of jobs. In 2016, there were 664,100 civilian employed in Hawaii, which was 77.4 percent of the number of total civilian jobs. The state's total civilian employed is projected to reach 757,000 by 2045, an annual growth of 0.45 percent and a 14.0 percent increase from the 2016 level.

Table 1- 6. Actual and Projected Civilian Employed

	1985 ¹	1995 ¹	2005 ¹	2016 ¹	2025 ²	2035 ²	2045 ²
State Total	452,000	552,000	608,950	664,100	694,600	728,100	757,000
Hawaii County	46,150	58,600	78,000	88,200	95,700	106,700	117,600
Honolulu County	341,150	405,850	427,000	458,000	474,000	488,500	499,500
Kauai County	20,550	25,550	31,000	34,700	36,300	39,000	41,600
Maui County	44,150	62,050	72,950	83,200	88,700	93,900	98,300
Average Annual Growth Rate							
	1985-95	1995-05	2005-16	2016-25	2025-35	2035-45	
State Total	2.0%	1.0%	0.8%	0.5%	0.5%	0.4%	
Hawaii County	2.4%	2.9%	1.1%	0.9%	1.1%	1.0%	
Honolulu County	1.8%	0.5%	0.6%	0.4%	0.3%	0.2%	
Kauai County	2.2%	2.0%	1.0%	0.5%	0.7%	0.6%	
Maui County	3.5%	1.6%	1.2%	0.7%	0.6%	0.5%	

¹ Actual figure, source: Hawaii State Department of Labor & Industrial Relations

² DBEDT projections.

4. Tourism

Visitor arrivals in Hawaii have gone through several different growth phases. Between 1960 and 1973, arrivals grew at a double-digit rate with an average annual growth rate of 18.3 percent. The growth slowed down between 1973 and 1990 with visitor arrivals growing at 5.7 percent annually before a decade long stagnation started. Visitor arrivals increased only 0.3 percent annually during 1990 to 2000. Starting in 2004, Hawaii visitor industry experienced rapid growth again, with visitor arrivals peaking in 2006 with 7.5 million visitors. Although the global economic downturn started in 2008 decreased visitor arrivals to Hawaii back to under 6.5 million in 2009, the loss was fully recovered within a few years. The number of visitors who came to Hawaii increased on average 4.7 percent per year from 2009 to 2017, marking a new record every year since 2012. In 2017, 9.26 million visitors came to Hawaii by air and including people who came by ship, 9.38 million visitors came.

The latest short-term forecasts by DBEDT (Quarterly Statistical & Economic Report: 1Q 2018) projected that the growth of visitor arrivals will slow down at 1.4-2.7 percent annually for the next 4 years. This projection for the near future is incorporated in this version of long-range projections. Long term visitor growth in Hawaii, however, will be affected not only by the

demand for Hawaii tourism but also the supply constraints in the state. Given the maturity of Hawaii's tourism industry and the increasing competition from other destinations, Hawaii's visitor arrivals are expected to grow at a slower rate into the long-term future as presented in Figure 1- 7. Detailed projection of Hawaii tourism for visitor arrival, days, daily census, expenditure and occupied visitor units are included in Appendix Table A-60 and A-61. Methodology and assumptions employed for the projections are explained in the next methodology section.

Figure 1- 7. Visitor Arrivals by Air, History and Projection

