COUNTY OF MAUI

COMPREHENSIVE ECONOMIC DEVELOPMENT STRATEGY (CEDS) 2022






This report was prepared by MEDB and funded under an Award from the U.S. Department of Commerce, Economic Development Administration (EDA), with support from the State of Hawai'i Department of Business, Economic Development & Tourism (DBEDT) and the County of Maui Office of Economic Development (OED)

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EXECUTIVE SUMMARY

- Maui County consists of the Hawaiian islands of Maui, Lāna‘i and Molokai (excluding Kalawao County, location of the Kalaupapa community). In 2021, the County had a population of 164,221 and an official labor force in July 2022 of 87,750 (in both cases, latest data available). The dominant economic activity in the County is the visitor industry, which in terms of direct and indirect employment, accounts for approximately two-thirds of the economy.
- Among the major challenges Maui County faces in economic development are:
  - Increasing the stock of attainable housing which affects quality of life, retention of residents, and presents a barrier to retaining and attracting skilled workers;
  - Managing the number of visitors that has put pressure on many communities and the natural environment, requiring a rebalancing of priorities;
  - Diversification of the economy;
  - Increasing the number and proportion of living wage jobs;
  - Improving the business environment which faces complex regulation and high shipping costs;
  - Improving and updating broadband and ensuring equity of access to high-speed internet;
  - Emerging from the COVID-19 pandemic and subsequent supply chain and inflationary issues.
- A consensus exists among residents and stakeholders that Maui County’s economic development should be measured by increased sustainability and resilience, especially considering Maui’s isolated geographic location and the likelihood of potential natural disasters, pandemics, or periodic economic downturns.
- There is also a consensus that the desirability of developing a vibrant, diversified economy must be balanced by sensitivity to residents’ needs and the County’s unique natural and cultural resources.
- The Comprehensive Economic Development Strategy (CEDS), mandated by the Economic Development Administration (EDA) of the U.S. Department of Commerce, is an economic roadmap to diversify and strengthen regional economies – in our case, Maui County.
- Usually conducted every 5 to 6 years, the purpose of the CEDS is to create a locally-based strategy for economic development and create an environment for economic prosperity and resilience. EDA and other Federal funding for projects, as well as some State and County funding, is informed by the CEDS and uses it as a criterion for decision making.

The CEDS was coordinated by the Maui Economic Development Board (MEDB), with similar exercises conducted on other Hawaiian islands by their respective EDBs. The Maui County CEDS forms part of the Hawaii State CEDS, along with the CEDS conducted by Hawai‘i Island, Kaua‘i, and O‘ahu.

- A Maui County Strategy Committee was formed to develop, guide, and review the CEDS process, composed of 37 representatives from major stakeholders in the community.
- The CEDS process is cluster based; a cluster is defined as a network of connected businesses, suppliers and associates in a specific field that are all located in the same geographical area. The Strategy Committee identified the main economic clusters in Maui County driving the economy:
  - Agriculture, Aquaculture and Forestry (including Business and Technology);
  - Attainable Housing and Construction;
  - Creative Industries (Culture and the Arts);
  - Eco-Economy (Conservation, Ecosystem and Environmental Restoration and Management, Climate Change Adaptation);
  - Energy (including Renewables);
  - Hawaiian Knowledge and Culture;
  - Health and Wellness;
  - Science, Technology, Innovation, and Efficiency;
  - Visitor Industry.
- In addition, geographical clusters for Hāna, Lāna‘i and Molokai were identified, recognizing that economic priorities in these communities are different.
- Focus Groups were established for each cluster, composed of representatives from businesses and entities engaged in the cluster as well as community members who responded to invitations put out on social media. The County administration and Maui County Council members were also asked to submit names of invitees.
- Virtual Focus Group meetings were held to conduct a SWOT exercise (Strengths, Weaknesses, Opportunities and Threats) and establish priorities and strategies for the cluster for the next five years and beyond. An economic update with disaggregated Maui County data and specific cluster data was also presented. A total of 212 attendees participated in the 11 online Focus Groups.
- In their meetings, Focus Groups were tasked with identifying the most important priorities for economic development for the cluster, as well as strategies to achieve these priorities. They were also asked to identify gaps in infrastructure and articulate strategies that could contribute to resilience.
- The CEDS Strategy Committee was convened on several occasions during this process to review Focus Group input and refine the goals and strategies.
- Among the leading Focus Group priorities were:

Agriculture, Aquaculture, and Forestry:

- *Establish municipal composting to promote waste diversion and soil fertility*
- *Develop local producer cooperatives to work with the government & private sector to improve land and water necessities and buying power (e.g. seeds/ equipment)*
- *Invest in Agriculture, Aquaculture, and Forestry education/promotion via schools & curricula to create workforce pipelines*

Attainable Housing and Construction:

- *Develop comprehensive rezoning strategy that better utilizes existing urbanized areas through infrastructure upgrades (Adhering to the guidance of the most recent archeological & environmental surveys developed after community plans)*
- *Increase attainable housing inventory for local residents that includes a housing pathway from Apartment to Condo to House*
- *Implement creative legislation regarding second+/empty home taxation regimes to disincentivize out-of-County and part-time resident buyers*

Creative Industries:

- *Create funding support via technical assistance for grants and arts organizations with a focus on operational expenses, capacity building and spaces within a cultural, place-based framework*
- *Establish a film production, digital media, music and sound facility/program on Maui with an incubator program for shared production facilities, etc.*
- *Revisit venues and facilities options and collaborations to better utilize and expand shared arts & culture spaces with a focus on the Wailuku Arts district*

Eco Economy:

- *Create a sustainable funding stream for conservation and biosecurity by implementing a clearly articulated plan*
- *Expand eco-sustainability focused tourism training for visitors & visitor guides: Mauka-makai, MISC, East Maui Watershed Partnership, etc.*
- *Create a Maui County Testing Lab to expand local diagnostic and monitoring processes and analyze data on-island and study environmental impacts*

Energy:

- *Develop and implement clear pathways for community-led planning and development opportunities and projects (e.g. community solar, shared energy)*
- *Create strategy for a broad and equitable adoption for renewable solutions based on need for households/industries via renewable tax credits and grants*
- *Increase infrastructure for electric vehicles*

Hawaiian Knowledge and Culture:

- *Increase funding opportunities and access to capital for Native Hawaiian owned businesses*
- *Apply indigenous knowledge and innovation across all economic sectors and `āina based organizations*
- *Advocate for Department of Hawaiian Home Lands (DHHL) clearing their waitlist*

Health and Wellness:

- *Build a streamlined, predictive model with proper tools to anticipate and prepare for future healthcare workforce needs of our community*
- *Pilot people-focused (not insurance company based) delivery model and prepare to scale*
- *Expand mental health services across Maui County*

Science, Technology, Innovation, and Efficiency:

- *Create incubator and accelerator facility and programs for Maui County businesses*
- *Develop new degree courses and industry-recognized certifications to provide pathways for higher-paying STEM jobs*
- *Develop online tools to make finding local tech talent easier*

Visitor Industry:
Per the Maui Nui Destination Management Action Plan 2021-2023

- *Create positive contributions to the quality of life for Maui County residents*
- *Support the maintenance, enhancement, and protections of Maui County's natural resources*
- *Ensure the authentic Hawaiian culture is perpetuated and accurately presented in experiences for residents and visitors, materials and marketing efforts*

Hāna:

- *Increase local to local business collaboration, development and networking to create a tight-knit Hāna network*
- *Create plan for civic center in Hāna to include business space & parking*
- *Regulate tourism and shift focus to cultural tourism to promote quality of visitors and mindful visitor management ("quality over quantity")*

Lāna'i:

- *Construct affordable housing on County-owned land*
- *Establish long-term care and retrofit homes to enable kūpuna to remain on-island*
- *Create a plan for 100-acre agriculture park*

Molokai:

- *Restore forests with native plants and trees*
- *Expand an aligned K-12 system in all Molokai schools to include sustainability, cultural relevance, service learning, STEM and computer science.*
- *Maximize locally sourced renewable energy to decrease electricity costs*
- *Secure guarantees for maintaining barge service, especially for farming community*

A number of "throughlines" were common to several of the Focus Group discussions. These included:

- Creation of educational/DOE/training/professional development pipeline;
- Cultural eco-tourism growth and development;
- Need for improved data tracking systems and Maui County data publication;
- Support for grant writing and technical assistance;
- Prioritization of needs based on urgency and impact;
- Need for streamlined County permitting process to clear pathways for community-led planning and development opportunities;
- Need to ensure water access and equity.

- A public online survey was also conducted to encourage feedback from Maui County residents and to determine priorities. The survey captured almost 600 responses from a wide cross-section of the community.
- This report includes cluster data and an economic narrative that informs recent trends in Maui County's economy and factors affecting the identified clusters.
- The Maui County CEDS report is a self-standing document for planning, decision-making, and informational purposes; it also informs, and is included in, the State of Hawai'i CEDS document that combines and integrates findings for each island.
- Next Steps: Development of an Action and Implementation Plan based on SMART goals (Specific, Measurable, Realistic, and Time Bound) which will guide Maui County in bringing priorities to fruition.

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MAUI COUNTY CEDS: PROCESS and METHODOLOGY

The Comprehensive Economic Development Strategy (CEDS) for Maui County was coordinated by the Maui Economic Development Board, Inc. (MEDB). As specified contractually by the Economic Development Administration (EDA) of the U.S. Department of Commerce, a Strategy Committee was formed to develop, guide, and review the CEDS process. As further required by EDA, MEDB enlisted a cross-section of all sectoral leaders and experts in the community to gain their mana‘o and benefit from their intimate knowledge of local skills and resources in strategy formulation and implementation.

The Strategy Committee therefore includes representatives of local government, business, industry, finance, agriculture, organized labor, utilities, education, community organizations, public health agencies, minorities, and women. Composition of the Maui County CEDS Strategy Committee, which convened virtually on several occasions between March 2022 and July 2022, is as follows (alphabetical order):

Debbie Cabebe, Maui Economic Opportunity (MEO)
Kyle Caires, Maui Farm Bureau
Grant Chun, Hale Mahaolu
Ryan Churchill, Pacific Rim Land & Lipoa Investments, LLC
Jud Cunningham, Maui Behavioral Health Resources
Ned Davis, Maui Innovation Group, LLC
Frank De Rego Jr., Maui Native Hawaiian Chamber of Commerce and MEDB
Lucienne De Naie, Maui Sierra Club
Kit Zulueta Furukawa, Maui Filipino Chamber of Commerce
Barry Helle, Wailea Old Blue, LLC
Lui Hokoana, University of Hawaii Maui College
JoAnn Inamasu, Maui County Office of Economic Development
William Kamai, Hawaii Regional Council of Carpenters
Bob King, Pacific Biodiesel Logistics
Keoni Kuoha, Hawaii Community Foundation
Naomi “Sissy” Lake-Farm, Maui Historical Society
Kanoa Leahy, Karey Kapoi Consulting
Wesley Lo, Hale Makua Health Services
Mahina Martin, Hawaiian Electric Co.
Tiare Martin, UH Vanguard Center of DoD High Performance Computing
Vince Mina, Hawaii Farmers Union

Claire Miyasato, Morgan Stanley
Kapono'ai Molitau, Native Intelligence
Marvin Moniz, Kahului Airport
Daron Nishimoto, E-O Solutions and MEDB
Lisa Paulson, Maui Hotel & Lodging Association
Jennifer Rappenecker, Edward Jones
Mike Rembis, Maui Memorial Medical Center
Tricia Rohlfing, Hawaii Pacific Solar
Diana Shaw, Lana'i Community Health Center
Darren Strand, Mahi Pono
Curtis Tom, Bank of Hawaii
Pamela Tumpap, Maui Chamber of Commerce
Jayson Watts, Mahi Pono
Carolyn Wright, Maui Academy of Performing Arts
Todd Yamashita, Hoahu Energy Cooperative Moloka`i
Jamie Yap, Hawaii State Department of Education

In the process of formulating an in-depth analysis of the economic challenges and opportunities for Maui County, the Strategy Committee identified the main economic clusters considered to be economic drivers for Maui County's economy. The CEDS process requires a cluster-based strategic approach, where clusters are defined as a network or group of firms, related economic actors, and institutions that are located near one another and that draw productive advantage from their mutual proximity and connections. They may be connected by functional relationship (e.g. suppliers and purchasers, producers and distributors) or by competition for similar markets. Cluster-based strategies provide numerous benefits including economies of scale, access to labor and knowledge, improved logistics, and greater opportunities to innovate. The clusters identified for Maui County, in alphabetical order, are:

- Agriculture, Aquaculture and Forestry (incl. Business and Technology)
- Attainable Housing and Construction
- Creative Industries (Culture and the Arts)
- Eco-Economy (Conservation, Ecosystem and Environmental Restoration & Management, Climate Change Adaptation)
- Energy (incl. Renewable)
- Hawaiian Knowledge and Culture
- Health and Wellness
- Science, Technology, Innovation and Efficiency
- Visitor Industry

The government, retail, and education sectors were also considered; the Strategy Committee concluded that, like small business, they are fundamental to all clusters and are threaded through them. The Committee also reviewed infrastructure needs common to all Clusters, including broadband expansion and equity of access, business incubation, educational initiatives, and the involvement of the non-profit sector.

The Strategy Committee recognized that economic development priorities in Hāna, Lāna'i and Molokai were likely to be different and decided to treat these communities as distinct geographical clusters.

To further inform the choice and importance of the clusters, MEDB used Social Media to distribute a Maui County Community Economic Survey in June 2022 to gather input on residents' priorities and opinion; 589 residents responded. The survey and an analysis of results is attached as Appendix 2 to this report.

As an integral part of the CEDS process, and as required by the EDA, Focus Groups representing each of the identified clusters and geographical locations were convened to gather input on economic development challenges, opportunities, priorities and strategies relevant to the formulation of the CEDS for Maui County. Invitations to the Focus Groups were extended to representatives from the public, private, and nonprofit spheres in each cluster, as well as by Social Media. Members of the Maui County Council and the County administration were also invited to submit names for invitation to the Focus Groups, or to direct them to meeting links. All of the Cluster Focus Group meetings were held virtually, by Zoom, in May and the first week of June 2022. A listing of Focus Group participants is provided in Appendix 3. Focus Group meeting participants were presented with an overview of the CEDS process and a brief economic background and update for Maui County, including demographic trends, labor force, income, housing, and visitor data. The presentation also presented data that were relevant and specific to each Cluster. Participants were then guided in a SWOT exercise (analysis of Strengths, Weaknesses, Opportunities, and Threats), with feedback gathered by means of a virtual Jamboard. Each Cluster Focus Group then defined priorities to be addressed over the next five years and identified strategies to actualize these priorities. A total of 212 participants contributed during this Focus Group process, and their input is incorporated into this CEDS report. In all, therefore, more than 830 residents were reached to contribute to the CEDS process in Maui County.

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MAUI COUNTY CEDS: VISION STATEMENT

The following Vision Statement incorporates feedback and validation from the 2022 CEDS Strategy Committee and reflects related contributions gathered during the Focus Group and consultation process that participants felt were important to include.

MAUI COUNTY VISION STATEMENT

Our unique island communities of Maui, Lānaʻi and Molokai innovate and diversify to ensure shared economic vitality.

CORE VALUES STATEMENT

In order to fulfill this vision, several intrinsic intersecting values are of paramount importance. These include (but are not limited to) economic opportunity for all, cultural traditions, stewardship of the environment and natural resources, strength through diversity, building resilience, respect and collaboration, broad-based community engagement, and the value of lifelong learning.

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MAUI COUNTY: ECONOMIC BACKGROUND

Introduction

The County of Maui is the second largest county by land area in the State of Hawai‘i. It consists of four main islands: Maui, Molokai, Lāna‘i, and Kaho‘olawe. The combined area of these islands is 1,171 square miles, including over 9 square miles of inland water; the island of Maui is the largest, with 734.5 square miles, and the islands have a total coastline of 210 statute miles. Kalawao County, a state-managed hospital community (Kalaupapa), is situated on the island of Molokai. The island of Kaho‘olawe is uninhabited and is in the process of being restored from a military practice site to a cultural reserve.

The island of Maui is the economic center and home to most (93.5% as of 2020) of the County’s residents and businesses; the town of Wailuku is the seat of county government, and the contiguous town of Kahului is the primary commercial center.

Transportation

Maui County is connected with the rest of the State and the Continental U.S. by regular air and sea transportation links. The island of Maui’s primary airport (OGG) is located in Kahului, the main business center; the publicly owned airport also provides general aviation, commuter, and helicopter services. The airport is operated by the Hawaii State Department of Transportation and handled around 6 million passengers in 2021, compared with approximately 2.5 million in the peak pandemic year of 2020 and almost 8 million in 2019. The Kahului-Honolulu corridor is ranked as one of the busiest (13th) in the United States.

The largest interisland carrier is Hawaiian Airlines, which provides frequent direct service to Honolulu as well as Hilo and Kona on the Big Island, and Lihue on Kaua’i. A smaller commuter airline, Mokulele Airlines, operated by Southern Express, connects Kahului to Hāna on Maui, Honolulu, Kailua-Kona and Waimea on the Big Island, Ho’olehua on Molokai , and Lāna‘i City. For residents of Molokai and Lāna‘i, the limited availability of air transportation is generally regarded as a challenge for economic development. Southwest Airlines entered the Hawai’i market in 2019 and operates inter-island flights from Kahului to Honolulu and Kailua-Kona. Aloha Airlines, which had competed with Hawaiian Airlines as the state’s main interisland carrier since the 1950s, ceased operation in 2008, but following liquidation proceedings, emerged as an independent cargo operator -- Aloha Air Cargo -- which continues freight flights between Kahului and Honolulu.

Kahului airport also has direct air links to the Continental U.S. The major carriers (in order of passenger loads in 2021-22) are Hawaiian Airlines (39% market share), Southwest Airlines

(16%), United Airlines (14%), Alaska Airlines (12%), and American Airlines (11%). Other carriers (8% of the market) include Delta Airlines, Air Canada, and West Jet. Cargo carriers to the Continental U.S. include Federal Express, UPS, and Amazon. Additional passenger flights and connections, including direct international routes, are available from Honolulu. The busiest routes from Kahului (April 2021 through March 2022) are Honolulu (HNL, 716,000), Los Angeles (LAX, 526,000), Seattle-Tacoma (SEA, 284,000), and San Francisco (SFO, 270,000).

A smaller, secondary airport on Maui is located close to the resort areas in West Maui at Kapalua (JHM), offering interisland service. Hāna, in East Maui, also has a small airport (HNM), with service mainly to Kahului. For the airports located on Molokai (MKK) at Ho'olehua and on Lāna'i (LNY), the most frequent scheduled service is to Honolulu. A small airport links the isolated hospital community at Kalaupapa on Molokai with Honolulu and Ho'olehua (MKK).

Maritime transportation is the primary means by which goods reach Maui County; about 3.7 million tons of cargo passes through the principal commercial port at Kahului in Maui annually, about two-thirds inbound and one-third outbound. About 79% of this freight traffic is manufactured equipment, machinery and manufactured products[1], and most of which is shipped via Honolulu. Kahului is the only commercial deep-draught harbor in the County (and one of ten in the State) and is the busiest port in the State outside O'ahu. Protected by two large breakwaters, the three-pier harbor occupies 45 acres of secured facility, and accommodates cruise ships as well as interisland freight barges, container vessels, other cargo vessels, tugboats, and gasoline and fuel oil tankers (much of the County's electricity is generated from diesel oil). In 2019, the harbor accommodated 677 vessel arrivals. In 2022, visiting cruise ships returned to Kahului Harbor following the pandemic hiatus of 2020 and 2021. Because of Kahului Harbor's size and commercial importance, the Harbors Division, Department of Transportation (DoT), State of Hawai'i, has devoted special care to long-range planning, and the 2012 Kahului Harbor Development Plan, based on the prior 2035 Master Plan, is the latest document to address planning issues.

[1] Maui County Data Book 2020

Kahului Harbor (DoT photo)

In addition, smaller boat harbors at Māʻalaea and Lahaina accommodate private recreational vessels and larger boats offering ocean activities, primarily for the visitor market (fishing, snorkeling, whale watching, etc.). A scheduled passenger ferry services from Lahaina to Lānaʻi is an important transportation links, but the Molokai ferry service was cut back in 2015, mainly due to airfare price competition among carriers, and ended in 2016. The main harbor on Molokai is located in Kaunakakai; on Lānaʻi, the harbor at Kaumalapau handles commercial traffic, and the newly refurbished Manele Harbor serves as the destination for the passenger ferry and public boating activities.

Utilities

All public service companies providing utilities on Maui are regulated by the Hawaiʻi Public Utilities Commission (PUC). The County's electricity provider is the Hawaii Electric Company (HECO), which acquired its former subsidiary, Maui Electric Company (MECO) in 1968. A corporate reorganization in early 2020 resulted in the utility name in Maui County reverting to Hawaiian Electric (HECO). As of 2020, the company serves over 73,000 customers in Maui County. In 2020, peak demand reached 184 Megawatts (mW) on Maui, 5.9 mW on Molokai, and 6.1 mW on Lāna'i (total "firm" – or dispatchable generating capacity comfortably exceeds

these numbers – about 250mW on Maui, 12mW on Molokai and 10mW on Lāna‘i). Maui island’s main electricity generating oil-fired plant is located at Mā‘alaea, with a smaller plant in Kahului that currently, is planned to close in 2024, although a final decision is pending. HECO estimates[2] that for Maui Island, 50.2% of electricity sales are derived from renewable sources, one of the highest proportions in the nation. Of this amount, 26% is derived from 3 wind farms and 23% from customer-sited solar PV. The remainder is accounted for by grid-scale solar and biofuels.

Maui’s sole gas utility is Hawaii Gas, which serves 810 accounts, as of 2020[3], an increase of 60% over 2016. Of these, 88% were residential accounts. Unlike O‘ahu, Maui does not have a Synthetic Natural Gas (SNG) underground pipeline network. Instead, utility customers use liquid propane, which is metered and some of which is supplied by underground lines. Other customers on Maui use non-utility service supplied by propane from cylinders and tanks; Maui Gas Service, a subsidiary of Amerigas, also provides non-utility gas service.

The public water system is managed by the Department of Water Supply (DWS), an agency of the County of Maui. DWS provides water to approximately 37,000 services on Maui and Molokai (the water system on Lāna‘i is privately owned). There are a number of private water companies on Maui Island, especially in West Maui, which are regulated as utilities by the PUC. On Molokai, the state’s Molokai Irrigation System serves a majority of agricultural and homestead users; Molokai Ranch, DHHL and the Kawela Plantation also provide water. In 2021, the State Commission on Water Resource Management (CWRM) granted a DHHL request to increase supply from the Kualapu‘u aquifer to the Home Lands, and Maui County is in the process of developing an updated long-term water plan for Molokai using an external consulting company.

Environment and Resources

The County of Maui enjoys a generally tropical climate, although there is a wide range of climatic and weather conditions due to the proximity of the ocean, the elevation of the mountains, irregular topography, and variable trade wind flow. Three-quarters of the island of Maui lies within 5 miles of the coastline, and no point on the island is further than 10½ miles from the ocean. All points in Molokai and Lāna‘i lie within 5 miles of the ocean. Haleakala is the highest point (10,023 feet) on Maui (Pu‘u Kukui, at 5,788 feet is the highest point in the West Maui watershed). The highest peak on Molokai is Kamakou (4,961 feet); on Lāna‘i, Lānaihale stands at 3,366 feet. Mean altitude is 2,390 feet on Maui, 1,150 feet on Molokai, and 1,140 feet on Lāna‘i.

[2] HECO Sustainability Report 2021-2022.
[3] Maui County Data Book, 2020

There are generally regarded to be two seasons in Hawai‘i: the cooler, wetter winter months (November-April), and the warmer, dryer summer (May-October). Daily sea-level temperatures in Maui County generally average 67° F. to 84° F. Even in the hotter summer months, sea-level temperatures rarely exceed the low 90s, even in the dryer leeward areas. In winter, nighttime temperatures rarely fall below 60° F. although in Upcountry areas, winter nighttime temperatures typically fall into the 40s. Maui enjoys a year-round growing season.

It is estimated that the “natural” level of rainfall for the area of the Pacific Ocean that Maui occupies (that is, if the Hawaiian Islands did not exist) is about 25 inches a year. However, the actual average rainfall for Maui is about 70 inches, because the mountainous topography and proximity of so much of the land to the ocean. The driest areas of Maui (such as Kihei and leeward coasts) receive less than 20 inches of rain per year, on average, while in other areas, such as the lower windward slopes of Haleakalā, annual rainfall is over 200 inches. Pu’u Kukui in the West Maui Mountains is claimed to be one of the wettest places on earth with over 400 inches of rain per year.

Climate change, drought, sea-level rise and worsening ocean and fresh water quality are all current issues for Maui County, with coral bleaching and potential loss of living reefs also a major concern for the community. More on this subject is included in the Eco-Economy section below.

Of Maui island’s 465,800 acres, 94% is zoned by the State Land Use Commission as Agricultural or Conservation, the same as for Lāna‘i (84,763 acres); for Molokai (161,395 acres), the proportion is 97%. A majority of the remainder on each island is zoned urban[4]. On Maui, 15% of total land is classified as State-owned Forest Reserve, with a further 7% as Private Forest Land within Conservation district. On Molokai, Forest Reserve accounts for 7% of total land area, and on Lāna‘i, 8% is Private Forest Land. Although most of Maui is essentially rural, discussions at the Federal level have cast doubt on Maui retaining its valuable HUBZone[5] status beyond June 2023. This is due to a statistical calculation that combines the populations of the adjacent communities of Kahului and Wailuku (each with about 25,000 residents), automatically triggering re-designation of the whole of Maui as “metropolitan”. Such reclassification would likely apply also to the rural communities of Molokai and Lāna’i and have distinctly negative, far-reaching ramifications for the entire County. An extension to Maui County’s HUBZone status as “redesignated” was made in 2018, and the possibility of the loss of HUBZone status would present a serious challenge to economic development.

[4] Maui County Data Book, 2020
[5] Historically Underutilized Business Zone

In addition to its miles of sandy beaches and world-class reefs, Maui's natural attractions that drew more than 3 million visitors a year 2019[6] include the 10,000-foot dormant volcano, Haleakalā; the winding road to Hāna featuring tropical rainforest and sweeping ocean panoramas; 'Iao Valley, one of Maui's most important and spectacular watersheds; snorkeling and diving havens such as Molokini; the rolling landscapes and ranch lands Upcountry; and surfing and windsurfing meccas such as Jaws (at Peahi) and Hoʻokipa. Maui's environment and natural assets are proving to be much more than visitor attractions; Maui Nui is blessed with an abundance of resources that hold the potential to transform the sources of the County's energy, which promises to end the present reliance on imported fossil fuels. Among these sustainable resources are significant trade winds, reliable sunshine, strong ocean currents, ever-present waves, and geothermal potential. Extensive fertile acreage exists to potentially grow biofuels and biomass sources of energy.

Infrastructure

Maui County has 658 miles of streets and highways, of which 601 miles (over 90%) are paved. The County of Maui funds a public bus system that provides service in and between various Central, South, West, and Upcountry Maui communities. Annual ridership is averages over 6,500 per day or more than 2.3 million per year. An 80-fold increase over the 29,000 passengers in 2004, the bus system's inaugural year. In 2019, there were 190,710 registered vehicles in Maui County, an increase of 6% over the previous 5-year period, averaging 8,912 miles of travel per year[7].

In 2020, there were 73,535 housing units in Maui County, about 25% of which were vacant or used seasonally; 63% of the total were owner-occupied. There were 55,620 households in Maui County with an average size of 2.96 people, almost the same as the State average (2.94)[8]. In June 2022 the median price of a single-family home on Maui Island reached a record high of $1,255,000 and the median price of a condominium unit in the same month was $832,500. For Molokai, median sales price for a single-family home in December 2021 $540,000 (compared to $219,000 in 2016) and $652,500 (June 2022) for Lānaʻi[9]. For a discussion of the affordable housing crisis in Maui County that is unquestionably affecting prospects for economic development and is a major concern of the community, see the section below on the Attainable Housing and Construction Cluster.

[6] DBEDT, Visitor Statistics
[7] Maui County Data Book, 2020
[8] US Census Bureau, https://files.hawaii.gov/dbedt/census/acs/acs2020/5yr/ACS20_5yr_highlights_hi.pdf
[9] Realtors Association of Maui

There are four hospitals in the County: Maui Memorial Medical Center (MMMC), with 219 staffed acute-care beds, over 200 attending physicians, and a total of over 1,500 caregivers. It has the second-busiest ER in the state with over 50,000 visits per year[10]. Kula Hospital and Clinic has 123 beds (5 acute care and the remainder intermediate and long-term care), a 24-hour emergency room and outpatient clinic with lab and x-ray services. Lānaʻi Community Hospital has 14 staffed beds (of which 10 are for long-term care), 3 ER beds, and a staff of over 40. Molokai General Hospital has 15 critical-access beds and a staff of 80 (60 of whom are full-time).

Maui Memorial Medical Center

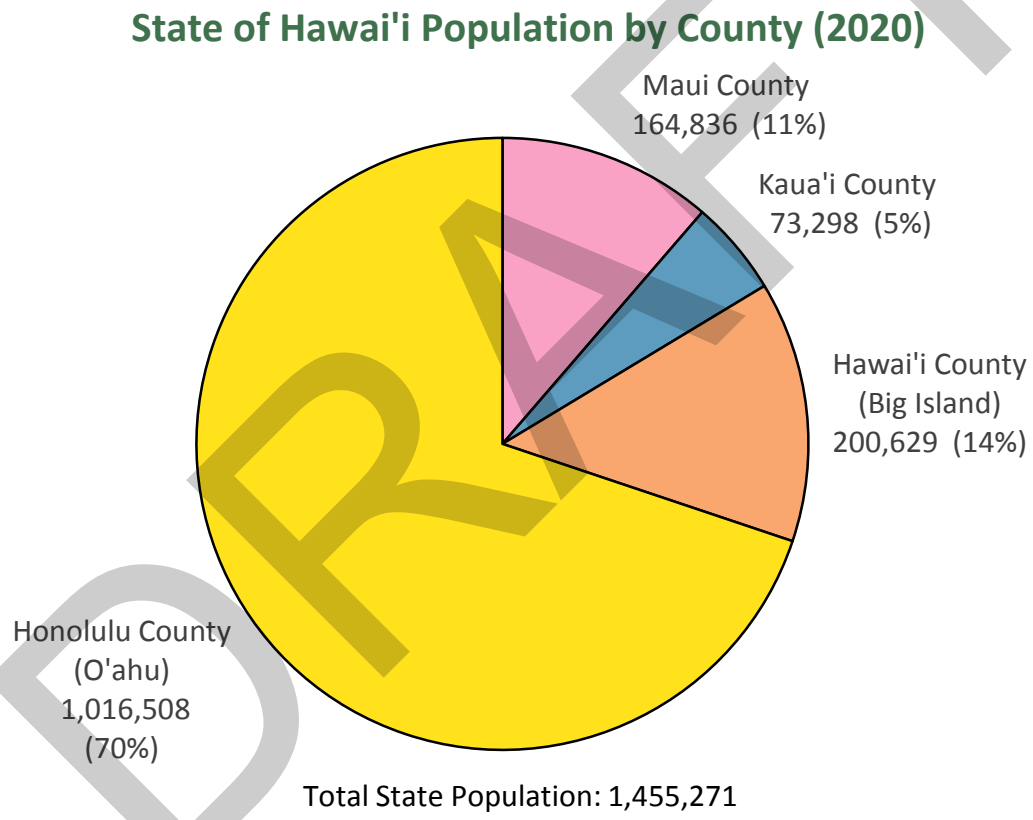
In terms of education, the University of Hawaiʻi Maui College (UHMC) currently offers 20 Associates degree and 3 four-year baccalaureate degrees (Applied Business & Technology, Sustainable Science Management, and Engineering Technology). It also offers 32 certification courses and continuing education courses. In 2021-22, UHMC had 2,724 students enrolled; in 2020, it awarded 593 degrees. Of the enrolled students, 27% attended full-time and 73% part-time; 33% were male and 67% female; 96% were Hawai'i residents. In terms of ethnicity, 30% were Hawaiian or part-Hawaiian, 25% Filipino, 15% Caucasian, 12% mixed race and 18% other ethnicity. There are five public high schools in the County, with a sixth (Kihei HS) due to open in early 2023. In 2020, enrollment levels ranged from 322 (Molokai HS) to 1,304 (Baldwin HS), 1,129 (King Kekaulike HS), 1,061 (Lahainaluna HS) and 2,082 (Maui HS). Hāna and Lānaʻi have multi-level schools that include high school. In 2020, there were over 21,000 students enrolled in public K-12 schools and a further 3,300 in private schools[11].

[10] https://www.mauihealth.org/services/emergency-services/
[11] Maui County Data Book, 2020

The County's solid waste and wastewater system is managed by the County of Maui's Department of Environmental Management. The County operates about 70% of all wastewater systems on Maui, 80% on Molokai, and the wastewater treatment plant on Lāna'i (some secondary treatment to R-1 standards is conducted via a private system). The remaining systems in the County are private.

Population

Maui County is the third most populous county in the state after Honolulu County (O'ahu) and the Big Island of Hawai'i with a resident population of 164,754 (2020 Census), which represents 11.5% of the state population (an increase from 10.6% in 2000 and 9.1% in 1990)[12].



Source: U.S. Census Bureau
Note: Total State Population: 1,455,271 (including Kalawao County)

Since Hawai'i became the 50th State in 1959, Maui's population growth rate has been the most pronounced of any County. Census data show that more than half of the current resident population of Maui County was born elsewhere. The population of Maui County has grown dramatically over the last 60 years, with almost a quadrupling since 1960.

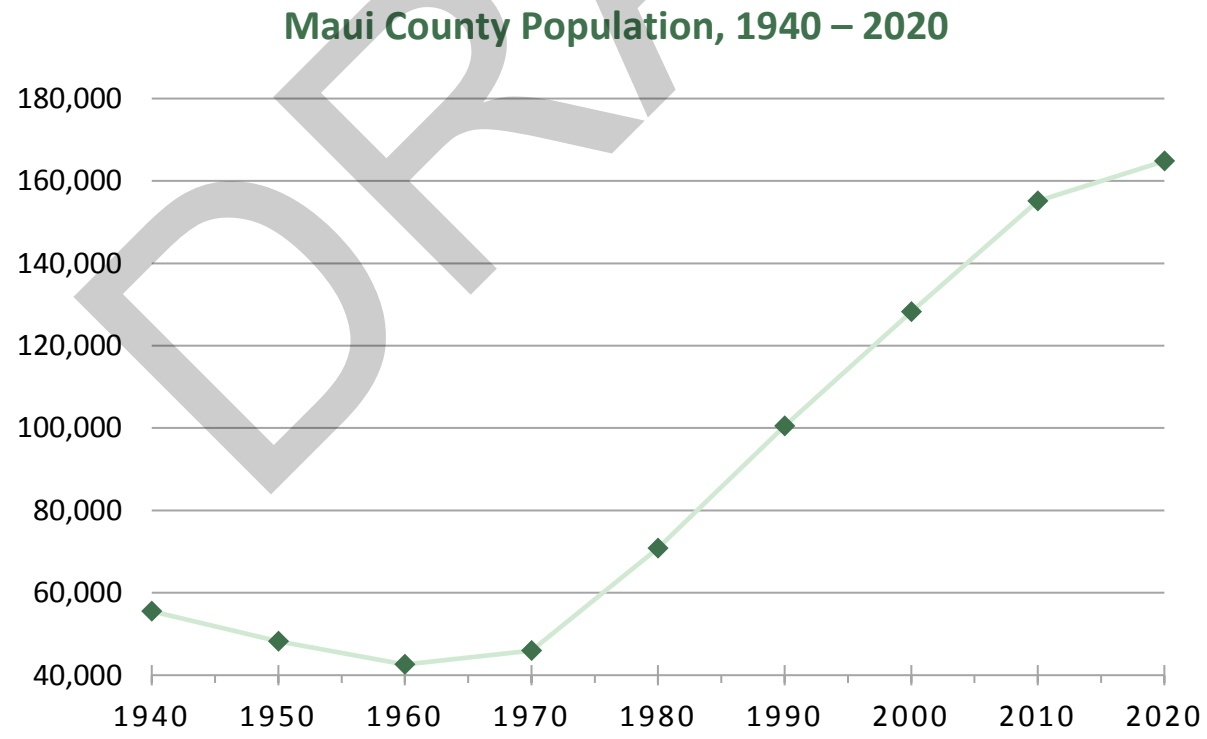
[12] DBEDT/U.S. Census Bureau, Population Division.

County of Maui Population and Percentage Change (1900 – 2020)

Year	Population	Percentage Change (%)
1900	26,743	11.3
1910	29,762	25.6
1920	37,385	25.6
1930	55,541	48.6
1940	55,534	0.0
1950	48,179	-13.2
1960	42,576	-11.6
1970	45,984	8.0
1980	70,847	54.1
1990	100,504	41.9
2000	128,241	27.6
2010	155,068	20.9
2020	164,836	6.3

Source: U.S. Census Bureau

Between 2000 and 2010, the County's growth rate increased by 21%, but since then – primarily due to the COVID-19 pandemic, population growth slowed dramatically, to 6% since 2010, the lowest growth rate in a decade since Statehood. Within Maui County, over 93% of the population resides on the island of Maui.



Source: U.S. Census Bureau

Resident Population of Maui County by Island (2000 – 2020)

Year	2000	2010	2020
Maui (Island)	117,044	144,588	154,100
Molokai	7,404	7,345	7,369
Lāna'i	3,193	3,135	3,367
Maui County *Total*	128,241	155,068	164,836

Source: DBEDT/ U.S. Census Bureau, Population Division
Note: Population data by island available in census years only

Over the period 1960-2020, the population of Maui County has increased at a faster rate than any other county and more than double the state average:

Annual Average Growth Rate in Resident Population by County (1960 – 2020, by Decade)

Date	Hawai'i (Total)	Maui County	Honolulu County	Kaua'i County	Hawai'i County
1960 – 1970	2.2%	0.8%	2.6%	0.6%	0.3%
1970 – 1980	2.5%	5.4%	2.1%	3.1%	4.2%
1980 – 1990	1.5%	4.1%	1.0%	3.1%	3.4%
1990 – 2000	0.9%	2.8%	0.5%	1.4%	2.4%
2000 – 2010	1.2%	2.1%	0.9%	1.5%	2.4%
2010 – 2020	0.7%	0.6%	0.7%	0.9%	0.8%

Source: DBEDT and U.S. Census Bureau

Over this period, the Maui County population has grown by 286%; Hawai'i Island by 227%, Kaua'i by 160%, Honolulu County (O'ahu) by 103%, with the State average at 130%.

Population by Race/Ethnicity

Maui County's population, like the rest of the state, is made up of diverse ethnic groups. The largest single group in 2020 is White (Caucasian), with 35% of the total, a slight increase from 34% in 2000. Those of Asian (28%), Native Hawaiian (11%), and persons of mixed race (25%) are the principal other ethnic groups:

Resident Population of Maui County and the State of Hawai'i (2000 – 2021)

	Maui County			State of Hawai'i		
	2000	2010	2021	2000	2010	2021
One Race						
White	33.9%	34.4%	34.7%	24.3%	24.7%	25.3%
Asian	31.1%	28.8%	28.2%	41.6%	38.6%	36.8%
Native Hawaiian & Pacific Islander	10.7%	10.4%	10.6%	9.4%	10.0%	10.5%
African American	0.4%	0.6%	0.6%	1.8%	1.6%	2.2%
American Indian or Alaska Native	0.4%	0.4%	0.6%	0.3%	0.3%	0.4%
Other Race	1.3%	1.9%	--	1.3%	1.2%	--
Two or More Races	22.2%	24.5%	25.1%	21.4%	23.6%	25.0%
Hispanic or Latino (of any race)	7.8%	10.1%	12.1%	7.2%	8.9%	11.1%

Source: DBEDT/U.S. Census Bureau
Note: Hispanic or Latino population is included in the ethnic categories above

Each island in Maui County has a very different racial and ethnic composition. 2020 Census data showed that Maui Island has a plurality of Caucasians (36%); Molokai has a plurality of those reporting themselves as Native Hawaiian or part-Hawaiian (44%); and Lāna'i has a majority of those with Asian heritage (56%) with a large Filipino contingent. The fastest growing population subgroup in Maui County between 2000 and 2020 has been Hispanic and Latinos; the group comprised 12.1% of the total population of Maui County in 2020 compared to 7.8% in 2000.

Population by Age

In terms of age distribution, Maui's population is aging, and at a faster rate than statewide; median age in 2020 was 42.0 years, compared to 39.6 years in 2010 and 36.8 years in 2000[13], in part reflecting older cohorts (especially those of retirement age) in-migrating. In comparison, the State median age is 40.0 years, up from 38.6 years in 2010. Highest median age in the State is Hawai'i County (43.3 years), and the lowest is Honolulu City and County (38.8). As of 2020, 18.3% of Maui's population was foreign born, the same proportion as in 2010.
Demographic data by broad age group for Maui County and the State are as follows:

[13] American Community Survey and Census data.

Age Distribution, Maui County and State of Hawai'i (2010 and 2020)

	Maui County		State of Hawai'i	
Age Group	**2010**	**2020**	**2010**	**2020**
Under 18 years old	21.4%	25.2%	21.0%	24.4%
18 – 64 years old	59.0%	62.0%	59.4%	61.8%
65 years old and over	19.6%	12.8%	19.6%	14.3%

Source: U.S. Census Bureau

As these data suggest, since the April 2020 Census enumeration, Maui County has seen a significant influx of older, remote workers, especially from the West Coast, as well as retirees and others who have made "life decisions" following the COVID-19 pandemic. This demographic shift has also made a significant impact on Maui's housing market.

Labor Force Trends and Sector Composition

The 17% increase in the labor force between 2005 and 2021 mirrors the population trend (+14%) over the same period. Data for 2020 and 2021 were greatly affected by the pandemic and thus off-trend. The labor force decrease of 3,750 between 2018 and 2022 also reflects in part the out-migration during the pandemic, especially younger workers who had lost their jobs and returned to the Continental U.S. to rejoin their family or those who sought work there in the absence of jobs in Maui County, especially in the visitor and related industries.

Labor Force Data, Maui County (2005 – 2022)

Year	Total Labor Force	Employed	Unemployed	Unemployment Rate
2005	74,050	72,250	1,800	2.4%
2006	75,600	73,650	1,950	2.6%
2007	77,800	76,100	1,750	2.2%
2008	78,900	76,000	2,850	3.6%
2009	75,700	69,250	6,450	8.5%
2010	79,600	73,150	6,450	8.1%
2011	81,100	74,900	6,250	7.7%
2012	79,900	74,850	5,050	6.3%
2013	79,900	76,150	3,750	4.7%
2014	82,650	79,050	3,550	4.3%
2015	84,500	81,550	2,950	3.5%
2016	86,000	83,550	2,450	2.9%
2017	89,650	87,550	2,150	2.4%
2018	90,300	88,500	1,800	2.0%
2019	88,600	86,600	2,000	2.3%
2020	84,900	58,800	26,100	30.8%
2021	86,450	80,100	6,350	8.3%
2022	86,550	82,900	3,650	4.2%

Source: DLIR
Notes: Data not seasonally adjusted; Date for May each year; Numbers rounded by DLIR; 2022 data preliminary

Sectoral analysis (following table) shows the proportions of the employed labor force (excluding agriculture) by major industries. Over the period 2000 to 2021, the sectors representing the visitor industry (the single largest economic driver of Maui County's economy) declined slightly, and especially during the peak COVID-19 pandemic year of 2020. As could be expected, the share of the labor force for Healthcare and Social Assistance leapt during the pandemic and showed notable resilience as the cluster was on the front line of countering the surge in COVID-19, to the point of becoming overstretched. Construction likewise showed resilience, not least because it was a sector that was mostly exempt from lockdown restrictions.

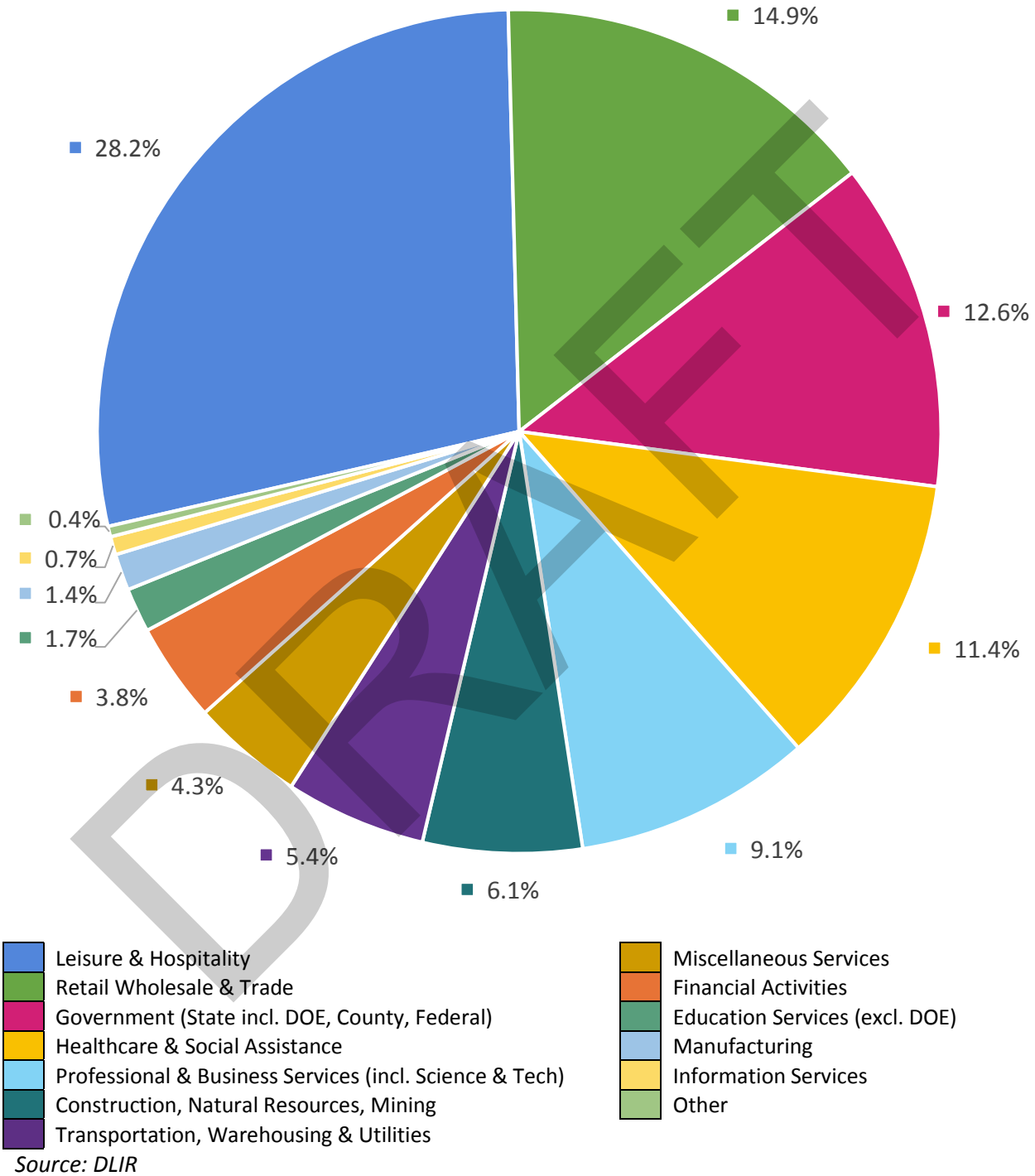
Employment by Sector, As Percent of Total Jobs, Maui County (2005 – 2022)

Sector	2000	2005	2010	2015	2020	2021
Employment as % of Total	100%	100%	100%	100%	100%	100%
Sector						
Leisure & Hospitality	32.1%	32.5%	27.5%	29.1%	23.5%	28.2%
Retail & Wholesale Trade	15.5%	15.7%	15.7%	13.4%	16.0%	14.9%
Transportation, Warehousing & Utilities	4.8%	4.5%	4.5%	5.3%	4.7%	5.4%
Subtotal	52.4%	52.2%	47.7%	47.8%	44.2%	48.5%
Government ***(State including DOE, County, Federal)***	13.4%	12.8%	15.4%	13.4%	14.4%	12.6%
Healthcare & Social Assistance	6.1%	6.6%	7.8%	7.6%	13.0%	11.4%
Professional & Business Services ***(Including Science & Tech)***	8.3%	8.7%	9.4%	9.4%	9.0%	9.1%
Construction, Natural Resources, Mining	5.1%	5.8%	4.3%	5.1%	7.2%	6.1%
Miscellaneous Services	4.0%	4.1%	4.5%	4.1%	4.4%	4.3%
Financial Activities	4.1%	4.4%	3.7%	4.0%	3.9%	3.8%
Education Services ***(Excluding DOE)***	1.0%	1.5%	1.5%	1.5%	0.7%	1.7%
Manufacturing	2.8%	2.2%	1.5%	1.6%	1.6%	1.4%
Information Services	1.5%	1.3%	1.1%	0.8%	0.7%	0.7%
Other	1.3%	0.4%	0.4%	0.3%	0.9%	0.4%

Source: DLIR

Note: Excludes Agriculture, Sectors ranked by order of magnitude in 2021

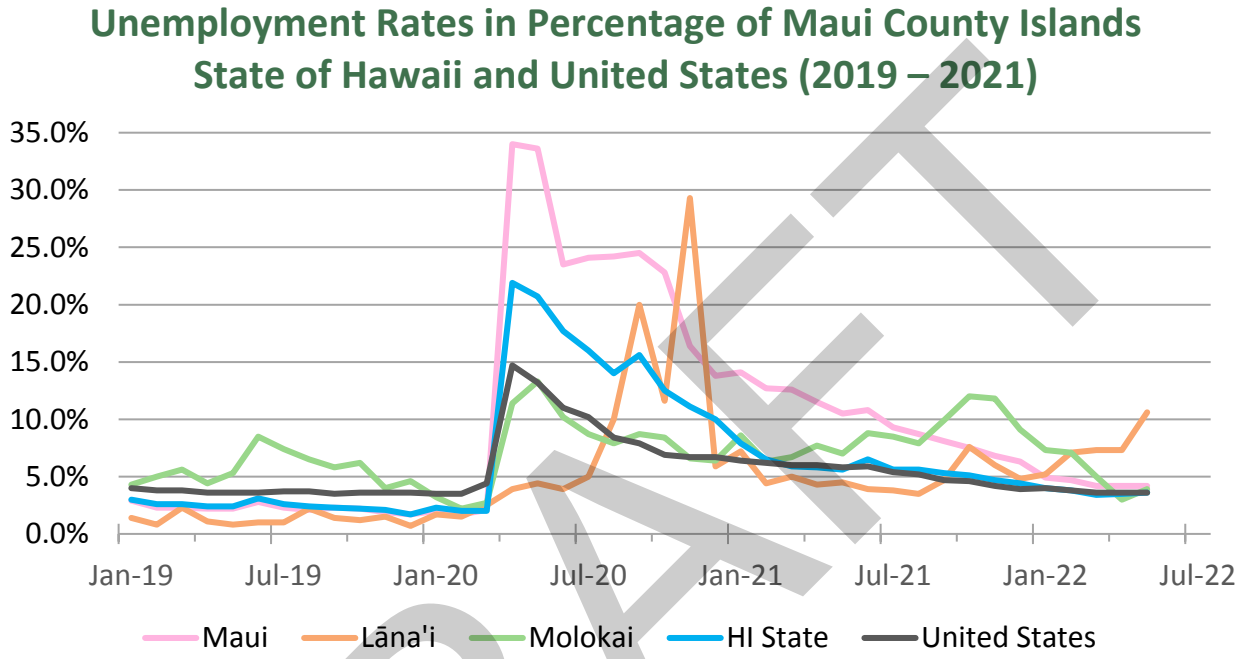
Maui County Job Count by Industry, 2021



Source: DLIR

Unemployment

Unemployment rates for Maui County for the period 2005-2022 are shown in the Labor Force table above. The following chart shows the monthly rates from 2019 through the course of the pandemic to 2022 for Maui County (blue line), the State of Hawai'i (yellow line), Lāna'i (orange line), and Molokai (purple line), compared to the U.S. average (green line).



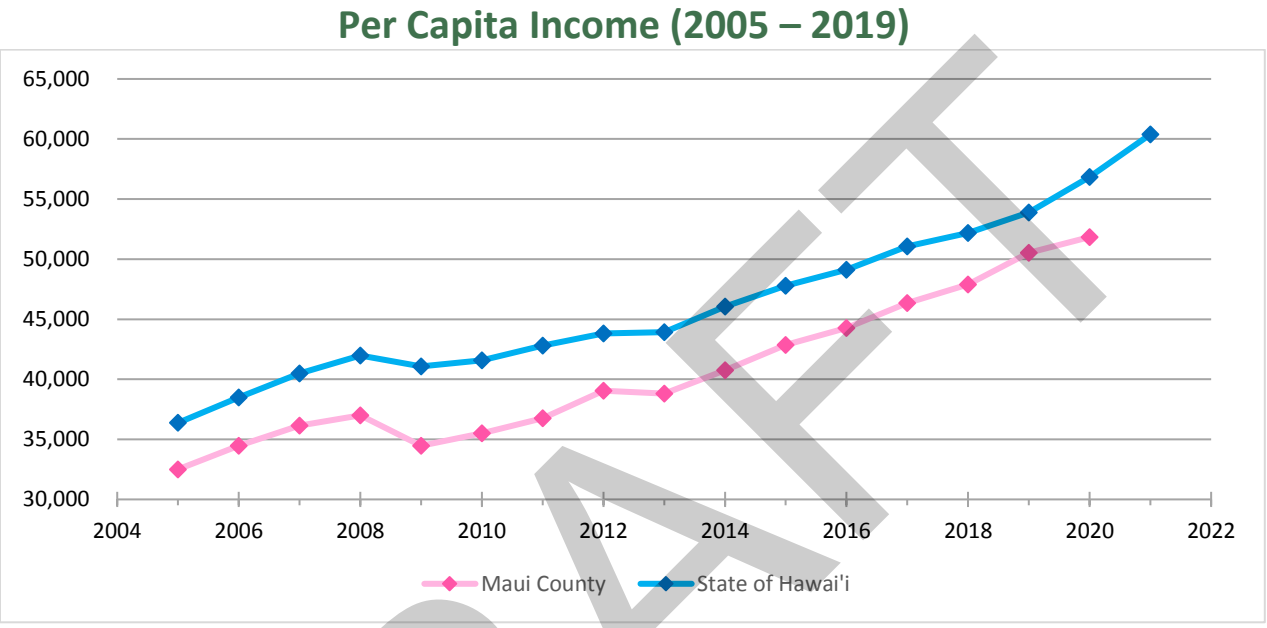
Source: DLIR

Until the first quarter of 2020, unemployment rates were at or near historic lows (2 to 3%) and the labor market reflected a robust economy. With the pandemic lockdown that began in mid-March 2020, Maui County registered the highest unemployment rate in the nation in April 2020 at 34% due to the effective shutdown of the visitor industry and other sectors of the economy, underscoring the lack of resilience in the face of economic shocks. In comparison, at the peak of the "Great Recession" of 2009, unemployment rates reached 14% in Maui County. The peak for Lāna'i during the pandemic occurred later, in the second half of 2020 when employer and government programs were tapering off. By mid-2022, unemployment rates had fallen closer to pre-pandemic levels at around 4% for Maui County as a whole – still higher than pre-pandemic.

Income Data

Per Capita Income (PCI) in Maui County has risen consistently over recent years, although in real terms (after allowing for inflation), growth has been less impressive. Between 2005 and 2020, PCI grew by 56%, but Hawai'i's inflation rate (as measured by the Honolulu Consumer Price Index), rose by 45% over the same period. Subsequent inflation, reaching 9% nationally in

mid-2022 will erode any income gains even more markedly. As the chart below shows, there has been a consistent relationship between Maui's PCI and that of the State as a whole, although Maui lags because the PCI for the County of Honolulu runs higher – by approximately $10,000 in 2020. Maui County data for 2021 is not yet available. PCI for Kaua'i is similar, and Hawai'i County lags Maui County levels by about $8,000.



Source: U.S. Bureau of Labor Statistics and Federal Reserve Board of St. Louis

Note: Personal income is defined as the income that is received by persons from all sources. It is calculated as the sum of wages and salaries, supplements to wages and salaries, proprietors' income with inventory valuation and capital consumption adjustments, rental income of persons with capital consumption adjustment, personal dividend income, personal interest income, and personal current transfer receipts, less contributions for government social insurance

Maui County's Housing Market

The long-term lack of attainable housing has for some time acted as an obstacle to attracting and sustaining a qualified workforce and thus limited economic diversification and growth. As in the 2016 CEDS process, many of the economic cluster Focus Groups cited this issue which has undoubtedly negatively impacted the quality of life for many residents. Similar issues exist in other counties in the State. Despite some recent progress in building affordable housing, the supply has not matched demand as real estate prices have soared during the pandemic. In addition, some residential housing stock has been lost to visitor use such as short-term vacation rentals, Airbnb, VRBO, etc., gentrification of formerly affordable neighborhoods and the targeting of some developments to offshore buyers. Analysis of trends and data can be found in the Attainable Housing and Construction section below.

Business Environment: A Postscript

There are some factors relating to the economic environment that fall within the scope of government agencies, organizations that advocate for businesses, economic diversity and development, as well as non-profits and academic institutions. Other factors are external or functions of geography and the environment. Maui County exists and operates within the context of the State of Hawai'i, as well as in a national context with customs, legislation, rules and regulations originating elsewhere.

In July 2022, the media network, CNBC, published a ranking of America's Top States for Business in 2022[14]. The ranking was based for all states on 88 metrics grouped into 10 broad categories to assess competitiveness (the methodology is explained in the footnote reference below). Hawai'i ranked 46th out of the 50 states. The leading states, in order of ranking, were North Carolina, Washington, Virginia, Colorado and Texas.

The 10 groupings are as follows, with Hawaii's ranking out of the 50 states listed in parentheses (1 being the highest, 50 the lowest):

Category	Rank
Workforce	19
Infrastructure	39
Cost of Doing Business	50
Economy	48
Life, Health, and Inclusion	3
Technology and Innovation	40
Business Friendliness	35
Education	38
Access to Capital	49
Cost of Living	50

Many of these factors pertaining to Maui County are discussed at length in the report that follows.

[14] https://www.cnbc.com/2022/07/13/americas-top-states-for-business-2022-the-full-rankings.html

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MAUI COUNTY CEDS: SWOT SUMMARY

Strategy Committee SWOT

At its first, virtual meeting (March 30, 2022), the Strategy Committee conducted an analysis of Maui County's Strengths, Weaknesses, Opportunities, and Threats (SWOT). This process, and the SWOTS for each Focus Group that followed, was conducted by means of a Jamboard, the virtual equivalent of using easels or post-it notes, whereby the Committee could contribute comments virtually through the Zoom medium, and later, vote for the Strengths, Weaknesses, Opportunities, and Threats for which they felt most strongly in favor. In each category, the order of comments reflects the degree of consensus (number of votes in support of the statement).

Strengths
Hawaiian culture and values
Deep sense of community/collaboration
Multicultural/ethnic diversity
Natural beauty
Ike of kūpuna
Wonderful year-round climate
Caring and competent workforce
Life/work balance opportunities
Aloha spirit and compassion for community
Business connections visit Maui from many places in the U.S. and world
Potential access to capital from wealthy individuals that call Maui home

Other (1 each): Maui is a well-known and highly regarded "brand"; Social services; Well established and dynamic visitor industry; Plentiful fresh water

Weaknesses:
Cost of housing
Over-dependence on tourism
Dependence on oil
Out migration of excellent workforce
Not enough capacity to address challenges our homeless and mentally ill face
Water issues affecting agricultural industry
Cost of living
Lack of workforce opportunities
Lack of workforce and aging population
Housing inventory
Communication infrastructure (i.e. broadband access and speed, mobile call service)
Cost of materials/supplies for construction

Education alignment to training and workforce needs
Lack of comprehensive understanding and support of a diverse economy
A lack of understanding of our finite resources from mountain to sea
Unwieldy permitting
Policy makers don't understand the variables involved in economic development
Insufficient funding to address invasive species
Lack of local, county, and state support and capital for innovation sector
Woeful lack of high speed fiber optic broadband infrastructure
Over development
Poor business climate
Lack of focus and support for conservation
Precarious/limited access to and from Lahaina

Other (1 each): Government hostility to particular sectors of the economy instead of a balanced approach; Water treatment is contentious/problematic; Lack of innovative strategic thinking; Minimal support for small business growth/incubation; Minimal tax incentives for startups/ small businesses; Maui marketed as a tourist destination

Opportunities:
Tech partnerships and remote work opportunities
Renewable energy
Technology
Collaboration between county/state government and non-profits to create more affordable housing
Workforce development and apprenticeship programs
Enough land available to build more housing and agriculture
Education and health
Better collaboration between education and local employers
Healthy, beautiful environment to support health/wellness industry
Native Hawaiian designations for businesses
Diversified ag-, eco-, edu- and volun- tourism
Assess/determine visitor capacity and impacts
Improve energy mix
Improve education
Better planning could protect priceless cultural landscapes vital for tourism and education
Workforce development and apprentice programs
Healthy environment for our host culture and more opportunities
Vacant buildings and land that could be repurposed for social needs
Agriculture industry/value added
Film and graphic arts
Reach out to immigration system to support small business workforce needs (e.g. Philippines)

Other (1 each): Professional skills exported (e.g. architecture and engineering); Telecommuting/ visual work; Leveraging the value of the Maui "brand"; Develop more greenways/alternative transportation options

Threats:
Reliance on tourism
Food security
Coastal erosion
Climate change that leads to drought/realistic water planning
Gentrification
Shortage of doctors and nurses
Loss of housing inventory to off-shore buyers
Aging infrastructure
Global ecomony‘s impact on tourism, other industries unmeasured
Insufficient family time
Lack of interim solutions to give unsheltered people a safe place to stay
Bifurcation of wealth
Lack of planning that considers limits for an island
Kama‘aina students do not find returning to Maui attractive
Security (e.g. international threat on connectivity)
Only one acute care hospital for a growing population
Geographic isolation
New Coronavirus variants
Maintaining our values

Other (1 each): Growing mental health crisis; Lack of pathways for entry-level workers; Real estate available to offshore and 2nd/3rd/4th home buyers; Maui is the #1 transient destination; Prevalence of residents using Amazon instead of shopping locally

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MAUI COUNTY CEDS STRATEGIC DIRECTION & ACTION PLAN: PRIORITIES AND STRATEGIES

Introduction

As directed by the Economic Development Administration, the determination of cluster priorities and strategies – with particular reference to infrastructure gaps that could serve to increase resilience – flows from the SWOT analysis and reflects the input of cluster Focus Groups and the Strategy Committee. These speak to the region's assets and limitations and their role in capacity building.

The CEDS Focus Group cluster discussions shared a number of "throughlines" – connecting themes, characteristics, and commonalities. Most of these are common strategies that include:

- Creation of an education to workforce training and professional development pipeline
- Desirability of the development and growth of cultural eco-tourism
- Data tracking systems and further data disaggregation for Maui County
- Support for grant writing and technical assistance
- Highlight Hawaiian culture as the leading epistemology in Maui Nui to protect home-grown intellectual property rights and encourage Native Hawaiian entrepreneurship
- Prioritization of needs based on urgency and impact
- Equity of access to and expansion of high-speed broadband
- Streamlining of County permitting to clear pathways for community-led planning and development opportunities and projects
- Access to water and equity of distribution
- Encouraging a transition to a "circular economy" with regeneration through use of renewable energy and resources

Each online Cluster Focus group was presented with an updated economic analysis for the State, Maui County, and cluster data. Following a SWOT exercise for their cluster, each group was tasked with identifying priorities for the cluster and strategies for addressing the priorities.

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Agriculture, Aquaculture, and Forestry (incl. Business and Technology)

Priorities and Strategies

Priorities[15]

- **Establish municipal composting facility to promote waste diversion and soil fertility**
- **Develop local producer cooperatives to work with the government and private sector to improve land and water necessities and buying power (seeds, equipment, etc.)**
- **Transition water access to the public domain to support timely infrastructure improvements and maintenance to be eligible for public financing**
- **Invest in Agriculture, Aquaculture and Forestry education/promotion via school and curricula to create workforce pipelines**
- **Establish a food security fund via tax revenues to increase local food production**
- **Create an invasive species/pest management plan (especially Axis deer) and launch implementation**

- Fund natural resource recovery specialists to manage food waste opportunities
- Improve access to short/long-term leasing of public and private ag lands for management and use
- Build affordable housing for Ag workers via tax incentives

Strategies

- Stimulate support for traditional and local agriculture/aquaculture
- Promote best practices to build soil health and drought resiliency programs to boost productivity
- Improve access for business planning/management and grantsmanship training for farmers and ranchers
- Defend the individual's right to farm
- Create legally enforceable Rights of Nature – an emerging environmental law area
- Reduce Ag regulations for farmers and eliminate existing bad regulations
- Amend property tax rules so that "Gentleman Farms" must produce revenue and provide employment to preserve tax rates and access to Ag-rate water
- Formulate strategies to develop Axis deer as a resource (incl. aligning legislation with Federal health regulations)

[15] Priorities in boldface are those with the most consensus by Members of the Focus Group

Agriculture, Aquaculture, and Forestry (incl. Business and Technology)

Cluster Analysis

In the summer of 2022, the County of Maui established its new Department of Agriculture. The agriculture landscape in Maui County features several organizations representing farmers, ranchers, flower growers, fisherpersons, and multiple support businesses, providing education and training, and advocating for sustainability and food security. These include the Maui Farm Bureau (MFB) and Hawai'i Farmers Union United (HFUU), UHMC Department of Agriculture, UH College of Tropical Agriculture and Human Resources (CTHAR), Maui Nui Food Alliance, Grow Some Good, Common Ground Collective, Go Farm, and Maui Farmer Network. Although these entities occupy the same cluster, their mission, goals and methodologies are diverse. In some cases, differences arise over agricultural scale, technology, and practice and for others, political and ethical issues transcend agriculture concerns. There were – and remain -- diverse opinions within the Agriculture cluster on the formation of, and the requirements for, the Maui County Department of Agriculture.

# # #

As the County of Maui website states, "Agriculture is deeply rooted in Maui history and will continue to be an important industry from an economic, social, and environmental perspective. Although the face of Maui agriculture has evolved over the years, the important role it plays in the islands' economy, environment, and way of life remains consistent, if not increasingly significant in the light of steady growth and expanding urbanization[16]."

Until the 1960s, Maui County's economy was dominated by Agriculture, the only industry specifically recognized in the Hawai'i State Constitution as being in the public interest: "The State shall conserve and protect agricultural lands, promote diversified agriculture, increase agricultural self-sufficiency and assure the availability of agriculturally suitable lands[17]." Through the 1980s and beyond (in the case of pineapple) and 2016 (in the case of sugar), the cluster was dominated by large-scale agricultural concerns and ranching activities (the latter, while not labor intensive, continues today). Labor-intensive small-scale farming, especially Upcountry, has always been an important part of the cluster. The pineapple industry steadily contracted until 2009 when the Maui Pineapple Company Ltd., a subsidiary of Maui Land and Pineapple, Inc. ceased operation. In December 2016, the last remaining large-scale sugar company in the state, Hawaiian Commercial & Sugar Co. (HC&S), likewise closed down.

[16] https://www.mauicounty.gov/144/Agriculture
[17] Article XI, Section 3 of the State Constitution.

In 2018, the 41,000 acres owned by HC&S was acquired by Mahi Pono, a Maui-based farming company that is a joint venture of a Pomona Farming LLC, a California agricultural group, and a Canadian pension fund. Mahi Pono is in the process of transforming the lands into a sustainable model of diversified agriculture. The company's goal is to grow food for local consumption, thus improving food security. Orchard and row crops include various citrus, avocados, 'ulu (breadfruit), watermelon, bananas, coffee, macadamia nuts, and vegetables such as onions, kale, squash, carrots, sweet potatoes, and green beans. As of 2022, Mahi Pono has planted over 1.2 million trees on 5,500 acres, with another 7,400 acres devoted to grass pasture to support a cattle grass-fed beef program. The company employs 300 full-time workers, with plans to expand to a workforce of 800 when plantings are maximized. In 2019, the company acquired 50% of East Maui Irrigation (EMI), the landmark 70-mile, gravity-fed water system established in the 1870s. A tenant farmer program leases farm-ready land to local farmers and as of 2021, 14 small farm operations occupied 60 acres of Mahi Pono land.

One report by the Maui County Farm Bureau in association with the County's Office of Economic Development[18] stated the case for the importance of the Agriculture cluster that remains as valid – if not more so – today. Among the factors cited, in addition to diverse job opportunities, job creation, and tax revenues, are locally grown food products that are fresher and higher-quality (as farm-to-table advocates will attest), increased food security, sustainability, resilience, biosecurity (minimizing the import of invasive species), and preservation of open space and viewscapes. Other important cluster assets are the cultural traditions and practices such as restoring and maintaining fishponds, growing taro, stream-based aquaculture, native forest and watershed preservation, inshore and ocean fishing, and hunting. Biofuel feedstock development (already pioneered by Pacific Biodiesel In Waikapū), exporting opportunities, responsible agricultural tourism and expansion of organic farming are further cluster opportunities. Since the last CEDS in 2016, the County has seen a welcome growth of farmer's markets across the region and increasing participation in the farm-to-consumer and ocean-to-consumer movements.

Among the most obvious challenges affecting the growth of the cluster are the availability of affordable water for irrigation, resolution of water rights issues, and the maintenance and development of infrastructure, external product competition, high shipping costs (Young Brothers rates rose 46% in 2021 alone), and a lack of affordable farm worker housing. Increasingly, for parts of the County, Axis deer overpopulation is a growing concern, with farmers and homeowners alike suffering the damaging effects of the foraging invasive species. However, some residents see this problem also as a potential opportunity for supporting food security if venison processing can be officially sanctioned and local facilities approved.

[18] Maui Agriculture Development Plan, 2009.

Another challenge in the Agriculture arena is that traditional, regenerative, and organic farming tend to be highly labor-intensive and technology adverse. The plantation economy was profitable in its heyday because of scale, volume, and abundant labor. While studies have shown that some customers are willing to pay up to a 15% premium for healthier-grown foods (such as non-GMO, organic, no additives), they are not willing to buy "unsightly" produce, however nutritious and healthy. No state or local agency knows the demand in terms of who is buying and at what cost. The majority of the population of Maui County cannot afford to pay the "healthy premium." The market for regenerative and local farm produce is ill-defined, and small farmers in Maui County are growing on speculation or anticipate demand at harvest time. Few farmers world-wide grow in this mode and fewer business schools advocate it.
In 2022, a new County Department of Agriculture was created and in July, a new Department Director (from Molokai) and Deputy Director were appointed. The Department's goals were established by a County Agriculture Working Group and include developing regional sustainable and diversified agriculture, building economic resiliency, supporting the health of residents and ecosystems through natural resource regeneration and protection, and improving food security.[19]

Data Review

The number of jobs in the Agriculture cluster were recorded by the State Department of Labor and Industrial Relations (DLIR) through 2012, **but not thereafter**. In the period 2000 to 2012, the official DLIR job count showed a range of 2,000 (2002) to 1,600 jobs (2012), with the decline in part due to the closure of Maui Pineapple Company Ltd.

The National Agricultural Statistical Service of the USDA (U.S. Department of Agriculture) holds Census of Agriculture every five years, the most recent occurring in 2002, 2007, 2012 and 2017. The next Census (2022) reporting deadline is February 2023.

Maui County: Numbers of Hired Workers (2002 – 2017)

Year	2002	2007	2012	2017
Number of Hired Workers	2,804	2,051	2,311	1,880

Source: USDA

The decline in the worker count between 2012 and 2017 is largely attributable to the closure of HC&S. The Census of 2017 reported an additional 1,814 unpaid workers (such as family workers). Combining both groups, Agriculture accounted for about 4.5% of the total labor force in 2017, using DLIR labor force estimates. This compares with 1960 data showing that 22% of the employed labor force in Maui County worked in agriculture, with a further 28% reported as

[19] "Molokai woman is tapped to be county agricultural director," Maui News, July 7, 2022

working in Food and Kindred Manufacturing, mostly in pineapple canneries and sugar mills for a total of 50% of the labor force[20]. In 1960, 17% of the population of Maui lived in HC&S housing[21] and 33% of the employed labor force statewide worked in agriculture.[22]

Additional Maui County Census of Agriculture highlights drawn from the five-yearly Census of Agriculture are as follows:

Maui County Farm Data (2002 – 2017)

	2002	2007	2012	2017
Acreage in Farms *(000s)*	256.7	225.6	229.2	249.0
Total Land Area *(%)*	34.5%	30.3%	30.8%	33.5%
Number of Farms	823	1,156	1,128	1,408
Number of Farms Hiring Workers	267 *(32%)*	245 *(21%)*	328 *(29%)*	365 *(26%)*
Average Farm Size *(acres)*	312	195	203	177
Median Farm Size *(acres)*	5	5	5	4
Average Age of Farmers *(years)*	55.0	57.7	59.0	60.4
Average Years on Present Farm	15.3	16.7	19.1	16.6

Source: USDA

The total acreage of farms in Maui County has declined from 355,000 acres in 1992 (48% of all land) to 249,000 in 2017 (34%). The growth in the number of farms reflects, in part, the creation of a new zoning category – rural two-acre "agricultural" subdivisions, mainly Upcountry. In addition, tax advantages benefited owners filing an Agricultural Plan with the County, leading to a proliferation of so-called "gentleman farms" or "gentleman estates." Many of these lots – formerly on lands that were large agricultural holdings -- were purchased by investors from the Continental U.S. or residents that could afford the price tag; most true farmers could not. This innovation was a contributing factor to the demographic influx to communities such as Haʻikū and Pāʻia, as well as explaining the lower average farm size (see also Table 4, below). A countervailing trend is the reduction in acreage available for farming due to limits in access to water, roads, and living space as well as new or enforced regulations.

Farm size is a significant factor because in the Continental U.S., food is typically grown and harvested by mechanical means and automation on very large farms or in greenhouses to high

[20] 1960 Census of the Population, U.S. Bureau of the Census.
[21] General Plan 2030, Maui Island Plan. County of Maui Department of Long-Range Planning. No residents have lived on plantations in recent decades.
[22] U.S. Bureau of the Census.

quality and high volume and therefore at low cost. Small farms produce lower volumes and are far more labor intensive. Even though the farm-to-table movement and specialty chef suppliers and growers have emerged in Maui County, the high demand by resorts, hotels, and restaurants well exceeds what can be supplied locally. In addition, the high standards of produce required (including by residents coming from areas where high quality is prevalent) means that smaller-scale farmers cannot compete with large, automated, corporate agricultural ventures from around the world, even factoring in the high cost of shipping. Even if more agricultural workers can be found, costs are likely to rise more than the resulting yield. While the rest of the world is moving towards larger, more automated, enclosed or vertical types of farm infrastructure, Maui County remains largely with the traditional agriculture model.

Another notable trend is the aging of the farmer population, rising from an average of 55 years in 2002 to over 60 in 2017. The fact that the average age is growing more slowly than the time period itself suggests that a significant number of younger individuals are joining the ranks. However, anecdotal evidence from the farming community confirms the fact that younger age groups are less interested in pursuing the family business – or the industry of agriculture as a whole -- than previous generations. The lure of higher pay in a more conducive (cleaner, cooler) environment, possibly with a benefit package, are among the explanations. The number of farms being sold because of the eldest family member retiring, dying, or becoming unable to work or manage the farm, is increasing.

Maui County Farms by Size (2017)

Farms (*by size*)	Number of Farms	Total Farms *(%)*
1 – 9 Acres	1,010	72%
10 – 49 Acres	252	18%
50 – 179 Acres	75	5%
180 – 499 Acres	23	2%
500 – 999 Acres	16	1%
1,000+ Acres	32	2%
Total	**1,408**	**100%**

Source: USDA

In terms of the total value of agricultural products sold in Maui County, the growth evident through 2012 ($188.1 million) slumped dramatically by 2017 ($74.2 million), primarily due to the closure of HC&S[23]. Consistent with the recent growth of small-scale farms, 71% of the total number of farms in Maui County have sales of less than $10,000 per year.

[23] Source: USDA Census of Agriculture.

Maui County Farms by Value of Sales (2017)

Farms *(by Value of Sales)*	Number of Farms	Total Farms *(%)*
Less than $2,500	632	45%
$2,500 – $4,999	175	12%
$5,000 – $9,999	201	14%
$10,000 – $24,999	161	11%
$25,000 – $49,999	93	7%
$50,000 – $99,999	78	6%
$100,000+	68	5%
Total	**1,408**	**100%**

Source: USDA

The seed industry (and especially seed corn) continues as a major contributor to agricultural sales, and 2019 data show it was the largest agricultural commodity in the state, representing 31% of total value of agriculture in Hawaii. Other crops produced in Maui County are as follows:

Maui County Crops by Type, Number of Farms and Farm Size (2017)

Type of Farm	Number of Farms	Acreage	Major Crops
Vegetables	221	1,377	Snap Beans, Taro, Cabbage, Lettuce
Citrus Fruits	378	286	Oranges, Limes, Lemons, Tangerines
Non-Citrus Fruits	667	2,809	Bananas, Avocados, Mangoes, Persimmons
Nuts	67	579	Macadamia
Livestock	193	n/a	Goats, Poultry, Cattle, Horses, Bees
Cut Flowers	166	449	n/s
Nursery Stock Crops	83	114	n/s

Source: USDA, National Agricultural Statistical Service

These data precede the presence of Mahi Pono, so the acreage for citrus and other fruit as well as vegetables, will be considerably higher in the next Agricultural Census. Other trends to note for Maui County agriculture are the increase in the number of USDA certified organic farms, from 27 in 2012 to 35 in 2017 (with 8 farms in transition to organic), and the increase in agritourism. In 2007, there were 30 farms in this category, rising to 52 in 2012 and 69 in 2017.

Agriculture – SWOT

Strengths
Favorable growing conditions
Hawaiian knowledge and culture/Aloha spirit
Creation of a County Department of Agriculture
Farmers' experience, knowledge and innovation
County (OED) support of ag resiliency projects/Approachable County policy makers
Biosecurity due to geographical isolation
Prioritization of food security and sustainability
Multicultural population with roots and traditions in agricultural progress
Water management area designations
Plentiful mulch sources
UH Maui College Ag focus
Value-add food processing potential
Potential legislation to encourage local ag product purchases

Others (1 each): Abundance of water; eco-consciousness; progressive population that values locally grown; Farmers Union; full-time USDA staff on Maui; emerging producer distribution channels (food hubs).

Weaknesses
Labor shortage/Lack of experts for hire
Excess cost of inputs vs. Continental U.S./Shipping costs
Access to land, water, capital/Cost of land
Aging/limited access to slaughterhouse facilities
Consolidation of local food service distributors (Kula Produce, Sysco, Armstrong)
Lack of value-add processing facilities
Lack of funding sources/support for small farmers/large farmers
Food and Ag Supply insecurity
Inconsistent rainfall/Cost of pumping water
Biosecurity at ports of entry
Effect of Axis deer population growth on ag production and environment
Poor State funding allocation for Hawaii Department of Agriculture (HDOA) programs
Shipping costs
Unsustainability of farms relying on grants
Dependence on imports
Lack of food waste composting
Local talent emigrating
Lack of using non-arable land for energy production (e.g. PV panels)
Lack of community-based water resource management
Invasive and non-native species

Opportunities

Encouragement and support for eating local farm-to-table/Maui chefs' willingness to buy local – even if costlier/Development of full agriculture and food ecosystem supporting local
Statewide support to preserve farming/ Advocacy groups for farmers and ranchers
Maui Wowie/growing hemp
Composting food waste
Local feed production of livestock feed
Technology to improve ag production efficiency (e.g. drones)
Agricultural tourism
Quality/freshness of local products vs. imports
Reform of High School ag curriculum
Maui brand name – positive/international recognition
Food as Healthcare
Myco (fungal) protein/access to biologicals and other ag products
Seasonal crops that can be grown cheaper than Continental U.S.
Biomass production
Natural farming hubs
Support of traditional food systems
Increase in demand-based farming and reduction of speculative farming
Virtual learning platform ag education
Locally grown Christmas trees and alternatives
Increasing value-add production

Others (1 each): Oyster farming; Growing alternative building materials; Utilizing 4-H and FFA (Future Farmers of America) to promote early interest in ag activities.

Threats

Rising fuel/Input costs and lack of availability/Cost of imported fertilizer and amendments
Lack of labor due to low wages/Lack of attainable housing
Lack of Statewide wildlife management plan and DLNR inactivity
Invasive species and lack of oversight
Exhausted soils
Climate change
Shipping threats during catastrophic events
Natural resource mismanagement
Lack of a strategic plan and funding to execute it
MISC laxity: focus on fundraising rather than addressing threats
Dept. of Health restrictions re value-add products
Cheaper production in Continental U.S.
Marketing structure via wholesalers creates farmer competition and lower prices
Lack of means of production

Others (1 each): Storms and pests; Geopolitical instability; Farm work unappealing; lack of funding resulting in slow development; lack of funding, time and support for implementation of fully local ag ecosystem.

Attainable Housing and Construction

Priorities and Strategies

Priorities[24]

- **Develop comprehensive rezoning strategy that better utilizes existing urban areas through infrastructure upgrades**[25]
- **Increase attainable housing inventory for local residents that includes a housing pathway from Apartment to Condo to House**
- **Implement creative legislation regarding second+/empty homes taxation regimes to disincentivize out-of-County and part-time resident buyers**
- **Streamline County permitting process**
- **Develop innovative wastewater infrastructure and expand R1 water system**
- **Build out infrastructure to identified designated growth areas**
- **Expand training and certification pathways in the skilled trades offered in Maui County (to include Architecture and Engineering support)**

- Include tiny homes, container homes and alternative Green building homes into County Code, to include Ag and DHHL lots
- Increase Affordable Housing Fund availability
- Reform Real Property Tax regime to encourage long-term housing and discourage offshore investment
- Complete the Community Plan

Strategies

- Provide funding for non-profit developers
- Infill development and adaptive reuse
- Encourage Sustainable housing design
- Prioritize walkable communities
- Offer universal financial literacy and education and housing counseling
- Require subsidized housing to be owner-occupied
- Make project-based housing vouchers available annually
- Create incentives for youth and recent college graduates to return home to work and offer mentorships and apprenticeships for professional jobs
- Create incentives for the Ag cluster to farm local building materials
- Utilize County land for affordable housing
- Facilitate and improve process for community consultation on development
- Create community-supported iwi and burial protocols

[24] Priorities in boldface are those with the most consensus by Members of the Focus Group
[25] Adhering to the guidance of the most recent archaeological and environmental surveys

Other: (1 each)
Innovative transit and transit-oriented development; Remove “no ‘ohana” restrictions in developments; Focus building in appropriate locations to minimize opposition (not wetlands or burial sites); coordinate an array of financing sources.

Attainable Housing and Construction

Cluster Analysis

"Workforce housing is a building block of our community." – CEDS Focus Group member

Housing – specifically affordable and attainable[26] housing – continues to be the major social and economic issue in Maui County. The previous (2016) CEDS report for the County identified the strategic necessity of increasing the stock of affordable housing as its availability not only affects the quality of life but also presents a barrier for retaining and attracting a skilled and in-demand workforce. Then, as now, several of the other Cluster Focus Groups convened for the CEDS process expressed the shortfall as a major weakness and a challenge for economic development across all economic sectors. The cluster Focus Group proposed some priorities and strategies needed to address this shortfall.

Certainly, the real estate market in the intervening period since 2016 has become even more unfavorable in terms of availability and affordability, especially since the COVID-19 pandemic began in 2020. This resulted in record unemployment rates and out-migration and a simultaneous influx of older, more affluent individuals and families which exerted a profound effect on the housing market. Some of this in-migration was retirees or those taking early retirement with the onset of the pandemic; others were remote workers and those who discovered the re-location possibilities that remote working offered. Yet others were making a "life decision" that echoed similar demographic changes following 9/11. This in-migration, partially offsetting the outmigration of service industry personnel who no longer had employment in the dormant visitor industry, together with offshore investors planning ahead, increased demand on a limited, and ever-decreasing, housing supply. Predictably, this resulted in a real estate boom that exceeded similar patterns experienced in the Continental U.S. Housing prices and rents rose by 40 to 50% in the two-year period following the onset of the pandemic, leaving many residents frozen out of an escalating housing market.

Several initiatives to promote attainable housing in Maui County have been discussed and proposed over recent years, and a number of projects have been approved and are moving

[26] This report refers to "affordable" and "attainable". While often used interchangeably, Affordable Housing can be defined as housing priced below the market value and typically requiring no more than 30% of a household's monthly income to buy. To achieve this, subsidies may be provided, generally by the government, to lower the cost that occupants need to pay for affordable housing. Attainable Housing can be defined as housing that is affordable to people earning around the Area Median Income (AMI). Households living in attainable housing and earning between 80% and 120% of the AMI should not need to spend more than 30% of their income on housing costs.

forward. Most recently, in 2021, the County issued the Maui County Comprehensive Affordable Housing Plan (MCCAHP)[27]. This Plan was guided by community recommendations derived through an interactive public outreach process; the principal goal of the Plan is to provide a roadmap to create, within a 5-year timeframe, 5,000 affordable homes for local residents earning less than 120% of the Annual Median Income (AMI). As the Plan noted. "A new affordable housing system must also invest in off-site infrastructure which stands [as] a key impediment to affordable housing development in the county."

The MCCAHP proposed five goals each with a set of targets for measurement of progress:

- Build 5,000 affordable homes for local residents at or below 120% area median income.
- Provide sufficient funding to the Affordable Housing Fund to finance the development of needed affordable housing and community serving infrastructure.
- Require developers to dedicate 20% of their land to affordable housing development and build housing that meets the needs of local residents when seeking resources from the Affordable Housing Fund.
- Use county owned land to develop affordable housing.
- Make the development process more accessible, predictable and timely.

In addition, the MCCAHP proposed five strategies to achieve the plan's goals, priorities, and targets:

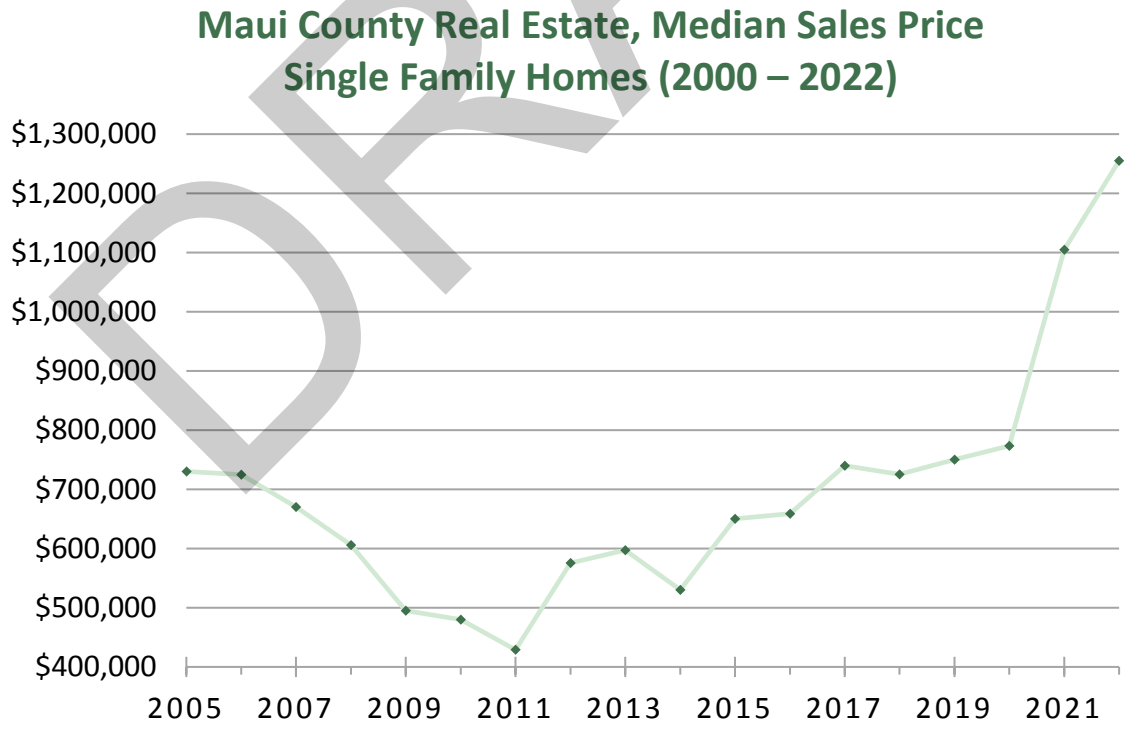
- Expansion of the Affordable Housing Fund to provide sufficient funds for community serving infrastructure and housing supports for local renters and homebuyers;
- Updates to the workforce housing agreement and development of dedicated land to affordable housing at greater densities to meet real demand without increasing unit requirements on developers;
- By-right development of 100% affordable housing projects through community decision-making and design standards that balance affordable housing while preserving valuable public health, cultural, and environmental resources;
- Development of long-term affordable housing on county-owned lands and in partnership with the State of Hawaii and private landowners;
- Pilot and demonstration projects such as acquisition and redevelopment of existing properties, supportive housing for extremely low-income residents (below 30% AMI), individual development accounts paired with new renter and homebuyer programs to obtain existing homes, and financing of in-fill housing to include accessory dwelling units, 'ohana units, and single-family homes.

[27] http://mauicounty.us/wp-content/uploads/2021/10/Maui-County-Comprehensive-Affordable-Housing-Plan.pdf

Among other projects to advance attainable and affordable housing in Maui County is the Hawai'i Community Foundation's House Maui Initiative, whose aim is to bring together non-profit organizations, homebuilders, funders, government agencies and community organizations to create affordable housing solutions. As the recently appointed Director of the Initiative, Keoni Kuoha, noted, "Secure, attainable housing is foundational to the wellbeing of Hawaii's people and places...Local residents want to remain in Hawaii, flourish, and maintain bonds with family, friends, their communities, and `āina –and we need affordable housing to make that happen."

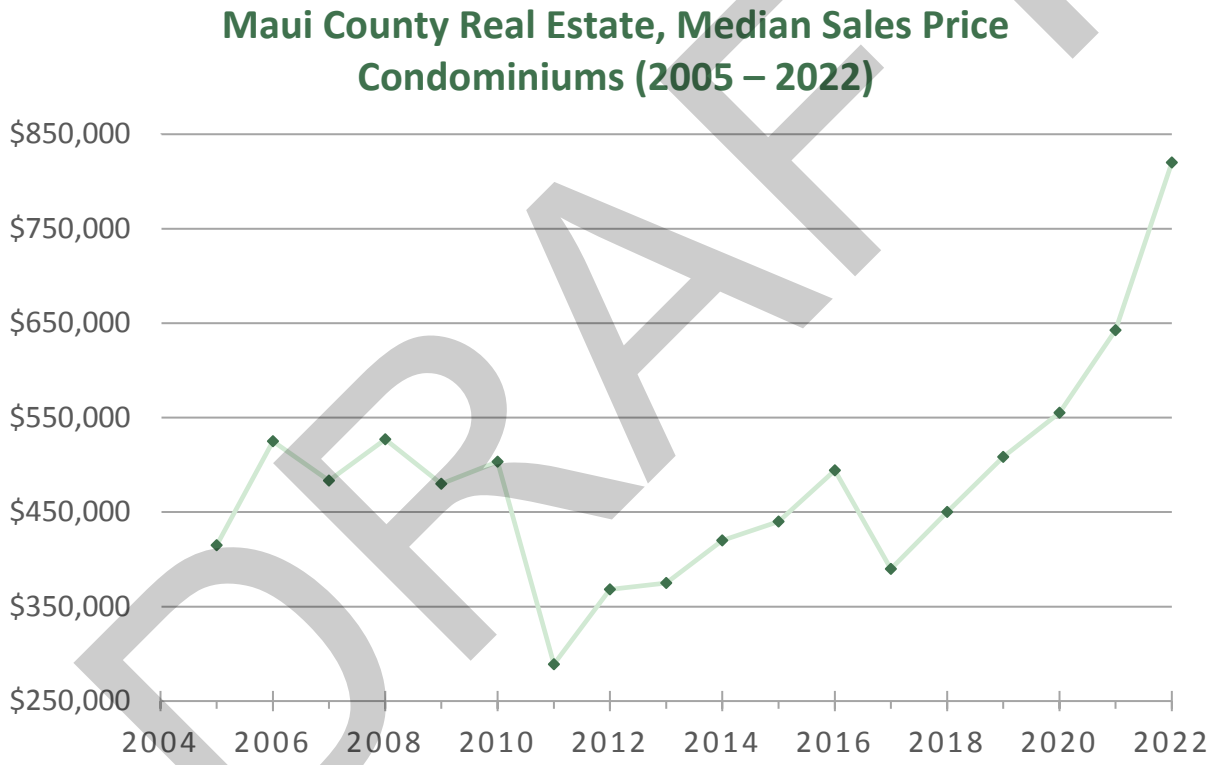
Data Review

To understand the present hot-button issue of housing affordability and availability in Maui County, a review of recent trends proves instructive. Prior to the "Great Recession" of 2008-09, median single-family home prices soared from less than $300,000 in 2000 to a peak of $725,000 in June of 2006. By May of 2012, after 6 years of a downward trend in prices, the market bottomed out at a median price of $382,000 – a drop of 53%. By April 2020, at the onset of the pandemic closedown, the median price had recovered over the intervening 8 years to $754,000, a 97% rise. A year later (April 2021), the median price for a single-family home was a then-record of $975,000 (a single-year increase of 29%), and by April 2022, $1,242,500 (a 27% increase from the previous year and 65% over 2020).



Source: Realtors Association of Maui
Note: Data from June of each year

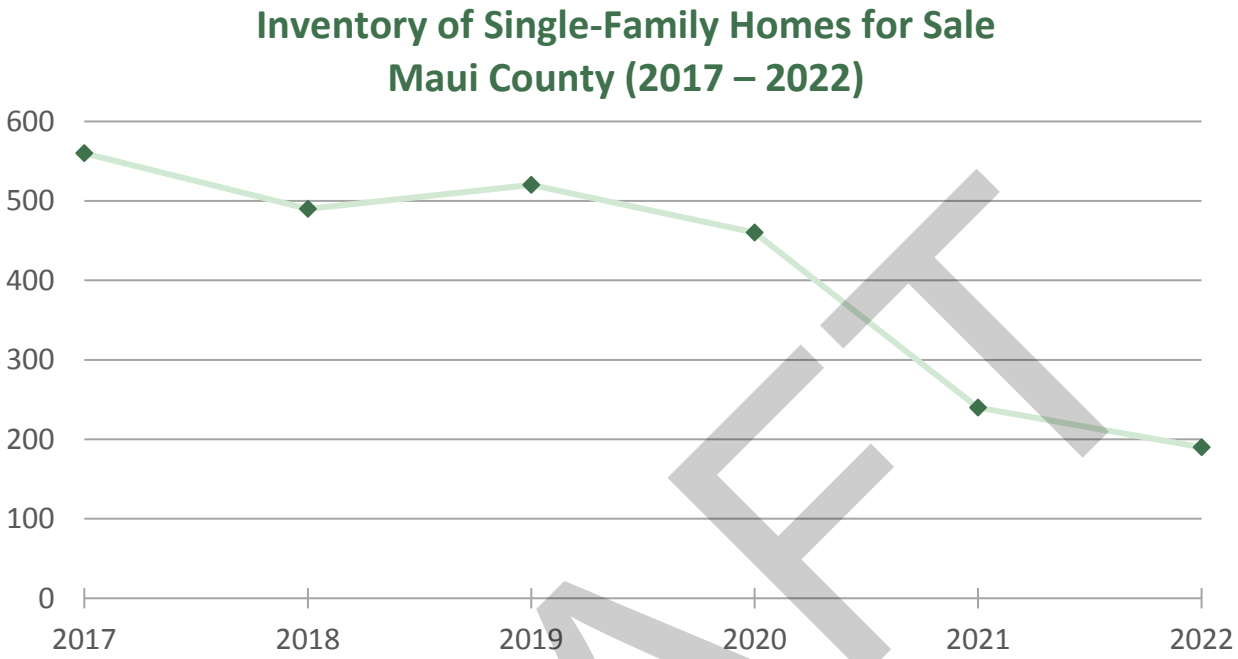
For condominium sales, the general long-term trend has been similar, but the median prices remained elevated at around $500,000 through the Great Recession, then declining in 2011 and 2013 to approximately $300,000. By 2019, median prices had recovered to the $500,000 range again, before taking off in the 2020 to 2022 period, rising by about 50% over this period and exceeding the $800,000 barrier (see chart below). In the case of both single-family homes and condominiums, offshore buyers constituted more than half of all purchasers, either with the intent of moving to Maui County in the short or longer term or investing in rental property. The scale of these price increases in turn priced many local residents out of the housing market. Rising interest rates in mid-2022 (and expected to continue beyond) are further discouraging home ownership and signs of a real estate market cooling are evident.



Source: Realtors Association of Maui

Over the last 2 years, during the pandemic, the significantly increased demand for housing coincided with an ever-shrinking inventory of properties on the market, resulting in the historic surge in prices. As the chart below shows, as recently as 2017, an average of well over 500 properties were on the market at any given time. By 2022, that number had fallen below 200. Likewise, reflecting the proliferation of cash deals, the median number of days a home or condo was on the market (from date of listing to date of closing), fell from 90 days pre-pandemic to

just 69 days in April 2022. A June 2022 market report[28] based on Realtor Association data cited that over 99% of listed single-family homes received at least their full asking price.



Source: Realtors Association of Maui

At the same time, unsurprisingly, the housing shortage has resulted in dramatic rent increases. A recent report by the University of Hawai'i Economic Research Organization (UHERO)[29] reported a rent spike of rental prices on Maui, with a 41% surge in asking prices over the past year. A June 2022 article[30] reported that "Rents across the country have gone through a period of historical growth in the past two years." The report noted that on Maui, "the median monthly rent price is $1,543 – 40.8% higher than the national average and among the highest of any U.S. metro area." Even so, anecdotally, many Maui County residents would tell you that the median rent price cited in this article seems surprisingly (and attractively) low. As reported in the Maui News[31], "In March 2021, the median-priced Craigslist posting for a rental unit on Maui was $1,850, while in March 2022 it had risen to $2,600, according to postings on Craigslist…" One longtime local resident and military veteran was quoted in the article as saying, "The reason why landlords are renting so high is not for the local people…It's for the guys that are moving in, and they're moving in by the droves. They like the beaches and the good weather. They don't care about the history and culture of Hawai'i…If nothing is done, it's

[28] "Has the housing market slowdown finally touched down in paradise?", GM Maui Group, email, June 14, 2022.
[29] "Foreign Visitors Will Provide Lift, But Risks Have Multiplied", UHERO 2nd Quarter Forecast, May 12, 2022.
[30] "O'ahu and Maui Have Some of the Highest Rents in the Nation", 24/7 Wall St. via The Center Square, June 9, 2022.
[31] "Report Shows Rent Prices Spiked 41% on Maui; Residents Worry About Finding a Place," Kehaulani Cerizo, Maui News, May 12, 2022.

going to get worse and worse." Whether strictly accurate or not, it is a view shared by many Maui County residents. A March 2022 report by Porch Research[32] found that 61% of renters across the biggest metropolitan areas in the U.S. are priced out of home ownership, with the figure at 93% for Maui County and 86% for urban Honolulu.

With housing affordability and attainability increasingly out of reach for Maui County residents, the implications for Maui County's labor force across all clusters and industries are profound. Even pre-pandemic, in 2019, a West-side workforce affordable housing survey conducted by MEDB of over 320 residents showed that 25% were considering a move to the Continental U.S., 75% of whom cited lack of affordable housing as a reason. Of those surveyed, 56% worked in the visitor industry, and 14% in the public sector (broadly representative percentages), and two-thirds had lived on Maui for at least 15 years; 19% of respondents were lifetime residents. In terms of affordability, a recent report by the National Low Income Housing Coalition[33] estimates that for the estimated 39% of renter households in Maui County, an affordable rent for a 2-bedroom home, at Fair Market Rent and a mean average wage would be $822. An affordable rent for a household earning the mean income of $95,000 would be about $2,400.

Low Income Rental Housing Affordability
Maui County and Statewide Hawai'i (2021)

	Maui County	Hawai'i (State)
Renter Households	39%	41%
Housing Wage *(a)*	$34.08	$37.69
Estimated Mean Renter Wage	$15.80	$17.56
Affordable Rent at Mean Renter Wage	$822.00	$913.00
Annual Wage *(a)*	$70,880	$78,401
Housing Cost *(b)*	$1,772	$1,960
Number Of Full Time For 2-Bedroom at FMR *(c)*	3.40	3.70
Area Median Income *(d)*	$95,900	$100,068
Rent Affordable at Ami	$2,398	$2,502

Source: National Low Income Housing Coalition, Out of Reach – The High Cost of Housing, 2021

Notes:

(a) Wage needed to afford rent and utilities for a 2-bedroom apartment at Fair Market Wage (FMR) – without paying more than 30% of income – assuming 40 hours pw, 52 weeks pa

(b) 2-bedroom apartment at Fair Market Wage (FMR) per HUD

(c) # FT Jobs at minimum wage

(d) AMI per household

[32] "Priced Out: 61% of Renters Can't Afford To Buy a Home In Their City", Porch Research, March 10, 2022, https://porch.com/advice/renters-priced-out-study

[33] "Out of Reach 2021 – The High Cost of Housing", National Low Income Housing Coalition, https://nlihc.org/sites/default/files/oor/2021/Out-of-Reach_2021.pdf

These data echo the findings of the recent ALICE report by the Aloha United Way[34]. ALICE is the acronym for Asset Limited, Income Constrained, Employed. According to the study, even before the full effects of the pandemic were manifested (impacting low-income households the hardest), 42% of employed households struggle to make ends meet. 9% live below the poverty level, and 33% earn more than the poverty level but not enough to afford basic household necessities including housing, clothing, child care, healthcare, transportation, and food. With a national annual inflation rate in 2022 running at 9% by midyear with little sign of abating in the short term and unemployment rates still above pre-pandemic levels, the affordability situation now in Maui County is even more acute.

A further factor contributing to Maui County's high real estate prices is that Hawai'i has some of the most restrictive government housing regulations in the nation, as reported in a recent UHERO report[35]. With the median home price in Hawai'i about two and a half times the national median, the report attributes part of the problem to the limited ability of the housing market to create the number of housing units necessary to meet demand: "Hawai'i's counties have some of the highest regulatory burdens, even when compared with the nation's 30 most expensive counties." Permitting wait times are roughly triple the national average, and in terms of housing requirements, Maui County falls within the top 5% in restrictiveness, of all the counties sampled. Maui County Department of Planning is cited in the report as providing an explanation: "Developing housing in Hawai'i is special…because of cultural and historical significance of the land. It therefore requires environmental and cultural reviews." In addition, much development falls within Special Management Areas (SMAs) because most supporting infrastructure is there, and these areas must usually undergo archaeological review.

Meanwhile, construction industry data can help shed light on the addition of housing stock to alleviate the shortage in inventory, as well as the status of the commercial building sector. Historically, the construction cluster has played an important role in the economic growth of Maui County since the 1960s when visitor industry infrastructure began to be developed. As a DBEDT report[36] noted, "Construction demand is influenced by the growth of population and the growth of other industries including hotel, retail, education, healthcare…The Construction industry differs from other industries in that, not only does it add economic value to the current year, but it also contributes to the capital stock to be used in future years. This is significant because capital stock is one of the main factors determining long-term economic growth."

[34] ALICE: A Study in Financial Hardship in Hawai'i, 2020, Aloha United Way. https://www.auw.org/alice-study-financial-hardship-hawaii
[35] "Measuring the Burden of Housing Regulation in Hawai'i", UHERO Brief, April 14, 2022. https://uhero.hawaii.edu/measuring-the-burden-of-housing-regulation-in-hawaii/
[36] Construction and Hawai'i's Economy, DBEDT, 2014.

Construction Job Count: Maui County Labor Force Data (2006 – 2021)

Year	2006	2007	2008	2009	2010	2011	2012	2013
Job Count	4,600	5,200	4,800	3,700	3,100	2,900	3,300	3,500
Year	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Job Count	3,700	4,100	4,300	4,400	4,400	4,500	4,400	4,200

Source: DLIR

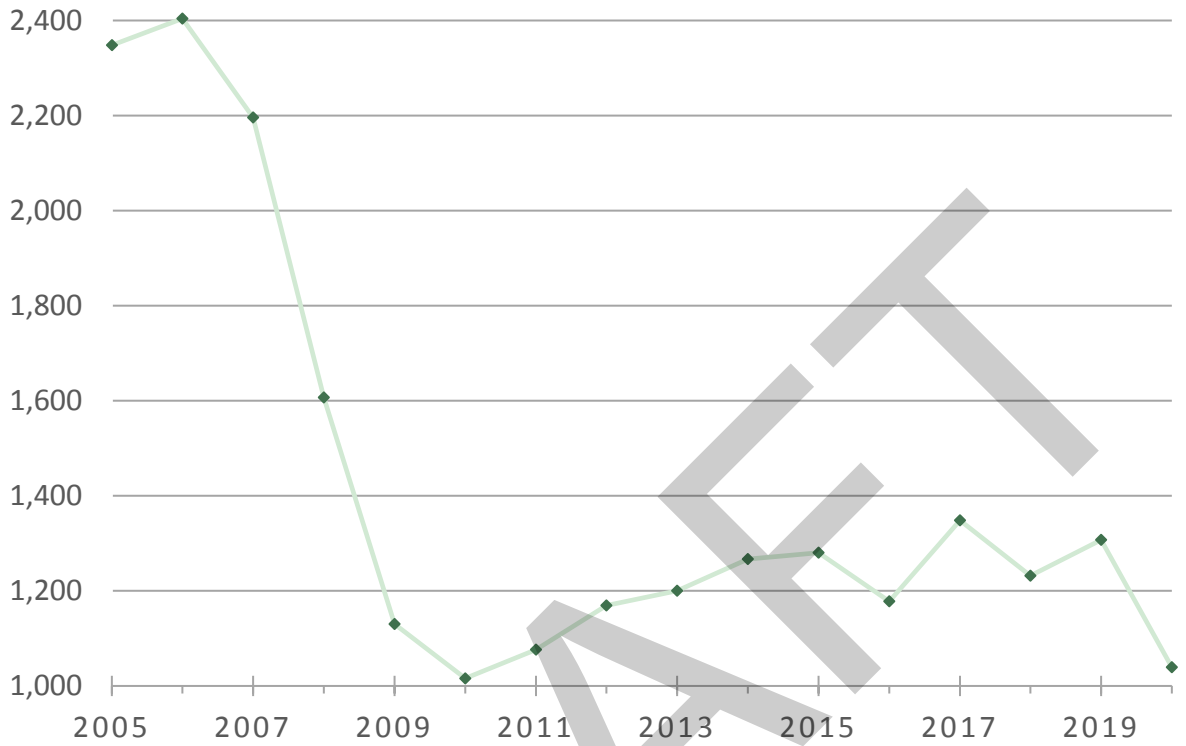
Note: Numbers are rounded, and include Natural Resources and Mining

The construction industry is an important economic driver for Maui County and accounts for a significant number of jobs – in 2021, 5.9% of the total. Employment in the cluster has not quite returned to pre-2008 levels because in the lead up to the "Great Recession", new home building was peaking; the residential building market contracted significantly over the next three years. Public spending on construction projects as part of the federal government's stimulus program, together with significant commercial development in Maui County, led the steady rebound in construction employment over the last decade. Large-scale capital projects included the development of the Kahului Business Park, the Lahaina Bypass, and airport improvements including construction of the rental car facility and the airport access road. The cluster was less affected by the pandemic than most as construction activities were largely permitted to continue operation during the initial lockdown, resulting in marked resilience compared to the rest of the economy.

The shortage of inventory in the residential housing market, described earlier, is also reflected in the generally flat trend of building permits issued in Maui County since the "Great Recession". Permit numbers fell by more than half between the 2006 peak and 2010, and numbers of permits issued in 2020 were strikingly close to levels in 2010. This trend suggests that housing inventory will remain low until the market shifts significantly.

A dramatic drop in the total number of building permits issued by the County Data occurred prior to the "Great Recession" of 2008-09 and has remained in the broad range of 1,000 to 1,400 since then (see Chart below). Data comparing the number, proportions, and values of permits by category in 2015 and 2020 show a decline in total value between these dates of just over one-third (see Table below). The major difference occurred in the value of hotel permits, which shrank from $308m. to less than $57m. Other permit categories also declined in value with the exception of residential permits, which increased by 15%.

Number of Building Permits, Maui County (2005 – 2020)



Source: DBEDT

Value and Percentage of Building Permits by Category Maui County (2015 and 2020)

Category	2015		2020	
	Value ($ million)	%	Value ($ million)	%
Residential	$177.6	24%	$205.0	44%
Hotel	$308.0	42%	$56.9	12%
Non-Residential	$122.4	17%	$90.5	19%
Additions & Alterations	$123.5	17%	$119.2	25%
Total ($ million)	$731.5	100%	$471.6	100%

Source: DBEDT

Also of note is that the construction cluster is significant in traditionally offering high wages, especially for construction trades; most are above the average for the whole economy. Given the shortage of skilled trades workers in Maui County and the acknowledged aim of adding high-paid, high-skill jobs to the resident workforce, the cluster Focus Group priority of stepping up training in the construction trades is a logical one.

Occupational Employment and Wage Estimates
Construction Industry, Maui County (2021)

Occupation	Average Annual Wage	Number Employed
First Line Supervisors	$88,250	350
Paving and Surfacing Equipment Operators	$87,510	60
Dry Wall & Ceiling Tile Installers	$81,460	110
Carpenters	$76,230	670
Electricians	$75,690	310
Construction Equipment Operators	$71,820	260
Construction & Building Inspectors	$69,590	50
Plumbers, Pipefitters	$68,760	260
Painters	$59,430	160
Construction Laborers	$59,360	500
Roofers	$52,440	70
Total: All Occupations, Maui County	**$55,970**	**64,090**

Source: Bureau of Labor Statistics

Attainable Housing and Construction – SWOT

Strengths

Native Hawaiian culture, history, and people
Community and political will, and advocacy for, attainable housing solutions/County housing plans and community plans
Environment and scenery/location
Access to parks and open spaces
Aloha spirit
Weather and climate
Diverse, multicultural community
Construction trades workforce
"Green" developers
Outstanding, community-minded non-profits
Affordable Housing Fund
Living culture, arts and music
Beneficial regulations protecting Ag lands and natural resources
Distinct communities – dense urban areas physically distanced
Historic town centers

Others (1 each): Not-for-profit affordable builders; Existing underutilized building stock.

Weaknesses

Lengthy/complex permit process
High cost of construction and shipping
Poor infrastructure – roads, water, wastewater
Building codes unsuitable for rural areas/Lack of Eco-village" zoning/Zoning loopholes and lack of Zoning enforcement
Commodification of homes as investments (esp. tourists)/industry focused on offshore buyers
Insufficient political will/Lack of County accountability
County municipal code deficient re green building, alternatives
County policy slow to change
Real property and other taxes favorable to offshore investors and detrimental for local housing
NIMBYism ("Not In My Back Yard")
Lack of locally grown building materials
"Brain drain" of local talent
Outsourcing design and ~~and~~ planning to offshore firms ignorant of local nuances and needs
Lack of community consensus and unified vision for planning and housing growth
Lack of attention to design and aesthetics
High homeless population
Lack of available land for development
Supply chain issues
Lack of affordable housing subsidies/Lack of incentives to develop affordable housing
Abundance of luxury homes and "fake farms"

Economic regulatory barriers
High cost of living
"Buy and flip" model of exploitation
Visitor industry model needs to change
High risk for builders and developers (high risk/return equation)

Others (1 each): Shortage of rental vehicles; Lack of experience and understanding; Building in inappropriate places (e.g. sensitive ecosystems/burial sites); Limited professional training opportunities for well-paid jobs.

Opportunities
"Tiny home" communities and eco-villages
Prioritization of increasing long-term rental inventory/Multi-family inventory
Green Building incentives
Adaptive reuse of housing stock
Provision of infrastructure for approved zoned projects
Food security/locally gown food
Tax incentives to convert short-term to long-term rentals
Comprehensive zoning and increased density in each zoning district
Development of wind, solar and wave power
Increase Ag zone density
Affordable Housing Fund
Pre-designed, easily permitted home packages
Develop education-to-construction trade pipeline
Encourage Infill development
Encourage off-grid living
Potential for increase in 'ohana units
Reform County taxation system
Allow for revocation of "no 'ohana" project conditions
Increased investment for, and collaboration with, Hawaiian Homesteads
Conversion of commercial properties to residential
Encourage and utilize billionaires' resources

Others (1 each): Increase rural housing; Assess "digital nomads" for infrastructure use (incl. bandwidth/data usage).

Threats
High cost of construction, materials, and shipping/Supply chain issues
Outmigration of residents/"Brain drain"
Excessive tourism/Presence of billionaires
Disconnected wealthy homeowners and negative attitudes of new residents resistant to community-wide improvements
Climate change and sea-level rise
Offshore real estate investment

Lack of affordable, livable housing
High cost of living and housing
Inability of County decision makers to build consensus/Inconsistent housing policies
Shortfall in recruitment of younger workers for construction trades/Retirement of older tradesmen
Food and energy insecurity – reliance on imports
Limited economic opportunity for residents
Acceptance of status quo
Natural disasters
U.S. law limiting housing market management (e.g. Fair Housing law)
Zero-sum mentality: must lose something to gain housing
Over-regulation designed as protection -- but unintended consequences
Lack of regulation for housing industry/home prices
Over-taxing small business and excessive fees and penalties

Others (1 each): Excessive number of realtors moving to Maui to make a quick buck; Over-population; Lack of rent control; limited water supply; short-term planning.

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Creative Industries

Priorities and Strategies

Priorities[37]

- **Create funding support via technical assistance grants and arts organizations with a focus on operational expenses, capacity building and spaces within a cultural, place-based framework**
- **Establish a film production, digital media, music and sound facility/program on Maui with an incubator program for shared production facilities, etc.**
- **Create a data tracking system and synthesized data metric around economic drivers in the creative industries within our County**
- **Revisit venues and facilities options and collaborations to better utilize and expand shared arts and culture spaces with a focus on the Wailuku Arts district**

- Develop cultural tourism (and eco-tourism) to supplant the existing tourism model

Strategies

- Provide professional development tools and digital media training for artists
- Extend reach to longtime local residents (community and homesteader associations/ organizations, and businesses involved with specific populations/Creatively democratize arts to extend reach and make part of everyone's everyday life
- Seek avenues for the rural communities of Hāna, Lāna'i and Molokai to have more voice and more opportunities
- Improve financial/scheduling accessibility to the MACC for local performing arts organizations
- Support the perpetuation and practical economic benefits of traditional Native Hawaiian arts
- Shift the focus to the intrinsic benefits of the arts, rather than entertainment
- Establish string music programs in all public schools, for all ages
- Develop a Creative Arts Alliance to coalesce interests, strengths, and shared goals
- Support inter-island collaboration
- Create an online library of available resources
- Facilitate collaboration and cooperation between different cultural traditions

Other (1): Develop Living Treasures program (Japanese model) to perpetuate native arts and artists.

[37] Priorities in boldface are those with the most consensus by Members of the Focus Group

Creative Industries
(Culture and the Arts)

Cluster Analysis and Data Review

Much of the cluster metrics are collected on the State level, and County-level data are limited. The State of Hawai'i has identified the development of creative industries as an important economic development strategy because Hawai'i's unique cultural diversity and its Hawaiian host culture are important attractions for millions of visitors and the spending they bring[38]. As important, they also enhance the quality of life and residents' sense of well-being. In addition, the unique nature of Hawai'i's creative, artistic and cultural cluster contributes to Hawai'i's creative products successfully competing globally and generating export revenues. Further, the cluster and its workforce are major sources of concepts and content for Hawai'i's emerging Science, Technology and Innovation cluster. There continued to be authentic concern for cultural appropriation.

The COVID-19 pandemic hit Hawai'i's arts and culture economy particularly hard. In a recent article based on U.S. Bureau of Labor Statistics data[39], the cluster shrank by 6.4% nationally, "nearly double the overall rate." Job loss in arts and culture for Hawai'i was estimated at 24.4%, second-worst only to Nevada (29.9%). Available labor force and job count data gathered by the State Department of Labor and Industrial Relations (DLIR) categorizes the most relevant segment of this cluster as Arts, Entertainment, and Recreation. Controversially, this grouping forms a subcategory of the Leisure and Hospitality sector; the remaining 90% (approximately) of jobs in this sector are accounted for by Accommodation and Food Services. (The Maui CEDS Focus Group for this cluster expressed their discontent with this official categorization).

Arts, Entertainment and Recreation Job Count: Maui County Labor Force Data (2006 – 2021)

Year	2006	2007	2008	2009	2010	2011	2012	2013
Job Count	2,500	2,500	2,500	2,100	1,900	2,000	2,100	2,300
Year	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Job Count	2,400	2,300	2,500	2,800	2,600	2,300	1,400	1,600

Source: DLIR
Note: Numbers are rounded by DLIR

[38] Hawai'i's Creative Industries: Update Report 2020, DBEDT, May 2020
[39] "The Ailing Arts," AARP Bulletin, July/August 2022. Page 46

Job count data since 2006 show a decline in employment of 24% during the "Great Recession" of 2008-09, reflecting mainly the decline in visitor numbers, building back to a peak of 2,800 in 2017. Numbers then declined over the following two years, by 18% to 2019, and by 50% between 2017 and 2020, the initial year of the COVID pandemic. This decline was even steeper than for Accommodation and Food Services (32%), confirming that the Creative Industry cluster fared worse, in job terms, than any other. As a share of the total job count in Maui County, the Arts, Entertainment and Recreation cluster accounted for about 3.5% of the total; by 2000 and 2021, that proportion had fallen to 2.3%. It should be noted, however, that these proportions in the cluster are significantly higher than for the State as a whole (the corresponding numbers were 2.0% in 2006, 2.1% in 2017, and 1.6% in 2021). The lack of disaggregated data for the cluster makes it hard to determine the significance of resident (compared to visitor) support and involvement, and its economic value to Maui County's population.

DBEDT's Creative Industries Division (CID) defines the cluster more broadly, to include film, digital media and animation; visual fine arts; design; culinary arts and events, literary arts, performing arts, cultural heritage and preservation, and arts education. The cluster is particularly notable for its highly skilled workforce, and its strong correlation with Visitor industry trends. Using ESRI (Economic Modeling Specialist International) web-based data, CID estimates that for Maui County in 2018, the Creative Industry cluster accounted for 6,609 jobs, or 12% of the State's 53,464 jobs – a 0.3% increase from 2008.

Creative Industry Jobs, Maui County (2008 – 2018)

Industry Group	2008	2009	2017	2018	2008 – 2018 Change (%)
Performing & Creative Arts	2,469	2,200	2,161	2,216	-1.1%
Marketing, Photography & Related	1,361	1,330	1,651	1,705	+2.9%
Music	387	334	500	445	+1.4%
Engineering & Research and Development	387	356	274	338	-1.4%
Business Consulting	361	355	439	458	-1.4%
Publishing & Information	339	303	234	229	-3.8%
Design Services	301	274	303	316	+0.5%
Computer & Digital Media Productions	279	319	403	415	+4.0%
Architecture	231	211	173	176	-2.7%
Radio & TV Broadcasting	141	135	79	81	-5.4%
Art Education	89	85	82	82	-0.8%
Cultural Activities	51	53	72	67	+2.9%
Film, TV, Video Production & Distribution	49	55	72	67	+2.9%
Total	6,445	6,010	6,449	6,609	+2.5%

Source: Hawai'i's Creative Industries: Update Report 2020, DEDBT, May 2020
Note: Derived from EMSI NAICS-based data. These data are the latest available published in this form.

It should be noted that CID's classification includes groups not regarded as Creative Industry in some other counts, such as Engineering and R&D, Marketing, and Business Consulting. The EMSI numbers also include proprietors and self-employed jobs and estimates for very small industries that are not reported by Federal agencies and DLIR.

Certain high performing groups not only grew jobs during the 2008-18 period but also increased their competitive share of the activity by exceeding national growth for the industry. These included: Marketing, Photography and Related, Cultural Activities, Film, TV, Video Production/Distribution, and Computer and Digital Media Products. The six creative industry groups that lost jobs in Maui County over the 2008 to 2018 period were (perhaps predictably) Radio and TV Broadcasting, and Publishing and Information; others were Architecture, Engineering and R&D, Performing and Creative Arts, and Art Education. As indicated above by DLIR data, job numbers for the pandemic era are likely to be significantly lower.

Cluster earnings data (also from the latest available source) show a wide disparity among industries, with earnings generally lower than the Hawai'i average, and significantly lower than (less than half of) the national average.

Creative Industry Average Annual Earnings, Maui County (2018)

Industry Group	Maui County	Hawai'i State	Maui vs. Hawai'i
Engineering and R&D	$93,257	$104,854	89%
Computer & Digital Media Productions	$85,303	$94,571	90%
Architecture	$59,531	$85,645	70%
Cultural Activities	$58,541	$52,666	111%
Film, TV, Video Production & Distribution	$55,718	$91,302	61%
Business Consulting	$54,841	$69,319	79%
Radio & TV Broadcasting	$53,923	$71,938	75%
Publishing & Information	$41,065	$53,821	76%
Design Services	$37,983	$36,436	104%
Marketing, Photography & Related	$29,975	$32,443	92%
Music	$27,899	$41,538	67%
Performing & Creative Arts	$27,308	$32,443	92%
Art Education	$16,323	$11,403	143%
Average	$39,650		

Source: Hawai'i's Creative Industries: Update Report 2020, DEDBT, May 2020
Note: Derived from EMSI NAICS-based data

The cluster average is depressed by the two industries with 59% of the total jobs (performing and creative arts and marketing, photography and related) with well below average earnings for the cluster as a whole. It is worth noting that in some of the delineated industries, jobs and earnings are less than full-time. However, the cluster average earnings of $39,659 compares with $31,250 in 2014, an increase of 27% over a 4- year span.

Studies on the overall economic impact of the Creative Industries in Maui County are sparse, but one instructive report[40] analyzed the impacts of nonprofit arts and culture organizations in Maui County. The study showed that an estimated $22 million in economic activity was generated annually and that 544 full-time equivalent jobs were supported, directly or indirectly. Two-thirds of event attendees were Maui residents, with the rest from off-island. The latter group spent almost triple per person than residents. The report also estimated that for every $100,000 spent by Arts and Culture nonprofits, 2 full-time jobs were supported and $49,000 generated in resident household income and almost $5,000 in resulting local and state government revenue.

A more recent, updated report by the same organization[41] included only statewide results for Hawai‘i, submitted by the Hawaii Arts Alliance representing 236 organizations, 109 of which (46%) responded to the survey. The total expenditures of $206 million (organizational and audience expenditures) supported an estimated 5,968 jobs, generating $23 million in local and state government revenue. In addition, for every $100,000 spent by Arts and Culture nonprofits in Hawai‘i, 3.5 full-time jobs were supported, $85,000 generated in resident household income and almost $12,000 in resulting local and state government revenue.

A 2021 article on the Maui Arts & Cultural Center (MACC) in the Maui News[42] described some of the multiple challenges facing a major Maui County Creative Industries nonprofit, mirroring the experience of most other nonprofits in the cluster during the COVID-19 pandemic. The number of events at the MACC went from 1,700 events a year, with over 238,000 people attending MACC events in 2018-19, to virtually zero. This resulted in financial “hemorrhaging,” while the MACC opted to keep many staff on the payroll and providing virtual and drive-in entertainment at no cost to the public. Limited live events resumed end-June 2021.

[40] Arts and Economic Prosperity III, Americans for the Arts, 2007.
[41] Arts and Economic Prosperity 5, Americans for the Arts, 2017.
[42] “MACC Survives Yearlong Loss of Shows and Income,” Maui News, June 26, 2021,

Creative Industries – SWOT

Strengths

Legacy and uniqueness of Native Hawaiian arts and culture/Nurturing and ~~and~~ perpetuation of Hawaiian culture by Hawaiian immersion schools
Many talented local artists practicing a variety of arts disciplines
Natural beauty of Maui County attractive to off-island artists
Planning underway for Art District with growing Public Art movement
Collaboration between arts organizations
Strength of Middle and High school arts education programs that nurture creativity and the arts
Location of the MACC, a world-class venue
Resilience of arts and culture in the County during COVID-19 pandemic, helping keep communities connected
Filmmaker Destin Daniel Cretton
~~Propect~~Prospect of Hālau of ʻŌiwi Art (Hawaiian cultural center in Wailuku)
UH Maui College arts programs, incl. online
Support by visitors of local arts and artists
Concept of Kakou – "in this together"

Others (1 each): Upcoming STEM facility at Maui High School; Hui No'eau.

Weaknesses

Lack of facilities and affordable spaces for the arts
Need for greater access in public schools to arts subjects (esp. Lānaʻi and Molokai)
Reduced access and high cost of MACC for local artists
Lack of recognition for Creative Industries as an economic driver and lack of data tracking (esp. Lānaʻi and Molokai)
Competition between existing arts groups and entities, especially for funding
Lack of ideal venue for classical music
Lack of professional/business support for creative artists and entities
Philanthropy from wealthy residents going offshore
Lack of marketing assistance for small business in arts and crafts
Low remuneration for creative artists
Cessation of Arts and Cultural Commission
Lack of interest by local residents in offerings
Lack of opportunities for public art
Hawaiian culture and arts not presented authentically to visitors
Cost of importing and exporting

Difficulty in administrating grant opportunities

Other: Lack of capacity of local groups to seek funding.

Opportunities

Federal, State, County, and private funding for the arts (and art spaces)
Potential/room for growth – new facilities, marketing development and ~~and~~ assistance
Leverage tourism to support the arts and local artists and rethink tourism and the arts
Increase collaboration between arts organizations and non-profits
Export opportunities for digital art media
Develop the Wailuku Arts District
Support and nurture creative arts classes
Explore/leverage health benefits of arts and culture
Share costs of visiting artists between islands
Separate/make distinct Creative Industries from Leisure/Hospitality cluster
Realize potential for artistic cross-pollination between different cultures
Increase art offerings for residents

Others (1 each): Job creation through more arts programs; Support State Foundation for Culture and the Arts (SFCA) effort to build a statewide directory of artists.

Threats

Preference for streaming events rather than in-person events
High costs of living/housing
Cost of new buildings and overcoming bureaucratic hurdles
U.S. economic conditions dampening support for the arts
Lack of funding and competition for donors
Lack of visitor education/awareness
Lack of cohesion/disconnected creative community
Slow rebound of in-person events post-COVID
Loss of Federal funding due to lack of scale/demography

Others (1 each): Lack of support for authentic Native Hawaiian arts and artists; Displacement/ disenfranchisement of Native Hawaiians and longtime resident artists; Lack of support for Creative Industries in the State legislature.

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Eco-Economy

(Incl. Conservation, Ecosystem and Environmental Restoration & Management, Climate Change Adaptation)

Priorities and Strategies

Priorities[43]

- **Create a sustainability funding stream for conservation and biosecurity by implementing a clearly articulated plan**
- **Expand eco-sustainability-focused tourism training for visitors and visitor guides: (mauka-makai, MISC, East Maui Watershed Partnership, etc.)**
- **Develop and implement a cohesive program that connects resident students (through to adults) to `āina**
- **Create a Maui County Testing Lab to expand local diagnostic and monitoring processes and analyze data on-island and study environmental impacts**
- **Create an Integrated water infrastructure management plan**

- Create a Workforce Development Plan to include the existing educational system (University of Hawai‘i, BYU Hawai‘i, etc.)
- Create an Ahupua‘a Restoration Plan
- Provide resources and support for fishpond restoration and protection
- Establish County-wide watershed management program with focus on protection, conservation and climate resilience of water resources (incl. surface, ground, ocean water)

Strategies

- Integrate a cultural, traditional and holistic approach into eco-economy strategies
- Prioritize actions by urgency; e.g. sea level rise, imminent extinctions
- Plan for net-zero Green House Gas (GHG) emissions across all clusters
- Integrate environmental and climate considerations across all clusters (incl. flood water management)
- Create goals and plans for urban and rural reforestation and planting
- Implement visitor fees to support the development of the eco-economy
- Address transportation issues
- Limit visitor numbers to not exceed natural resource and infrastructure capacity

[43] Priorities in boldface are those with the most consensus by Members of the Focus Group

Eco-Economy

Cluster Analysis and Data Review

"Intelligence is the ability to adapt to change" – Stephen Hawking

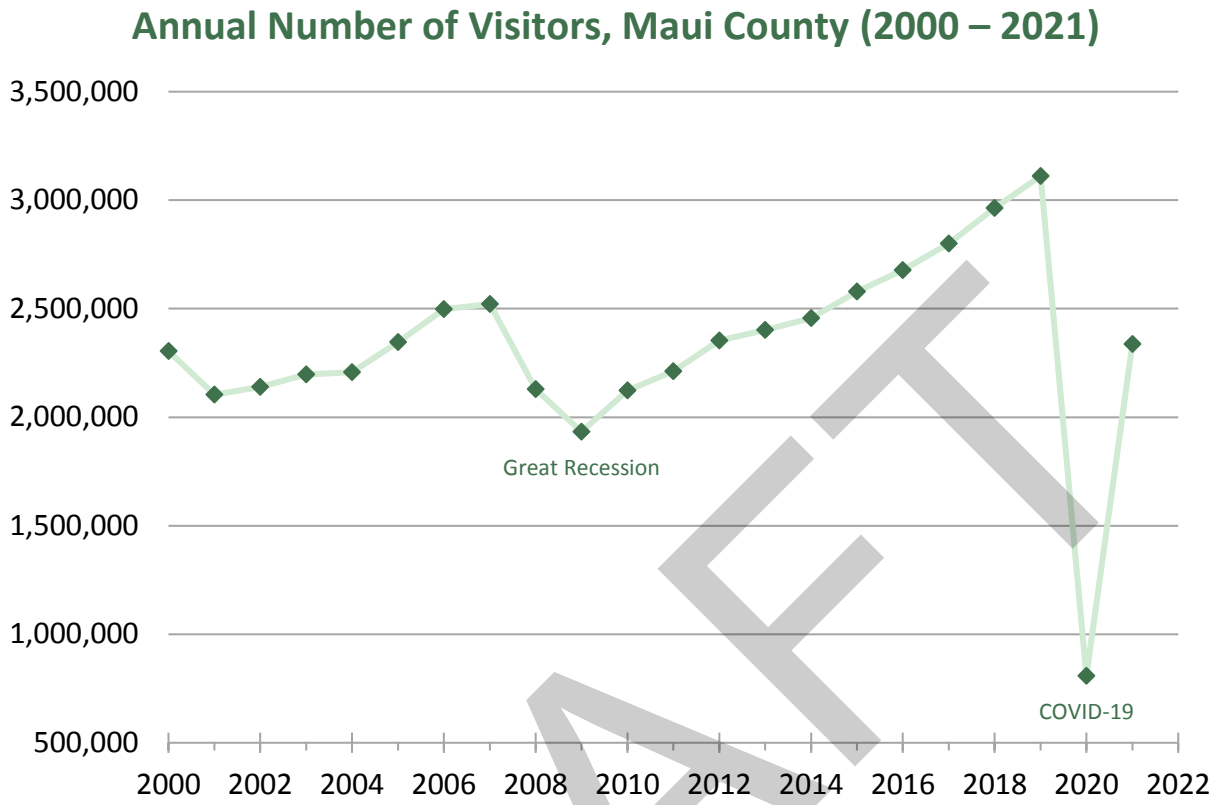
This cluster has been identified by the Maui County CEDS Strategy Committee for the first time as an economic driver with significant potential given growing scientific data regarding climate change and the need for adaptation and active remediation. Growing concerns have been expressed in recent years by residents regarding the necessity to preserve and conserve our County's environment and natural resources, both terrestrial and marine. Accelerating climate change, sea-level rise and storm surges are all issues in Maui County, affecting coastlines and resulting in beach erosion (notably, for example, Ma'alaea and Ka Hāna), with dialogue continuing on relocating the Honoapi'ilani Highway at Ukumehame in West Maui in the mauka direction. U.S. Senator Schatz, visiting the site in July 2022 commented, "We've got to get this done."[44] A recent national ABC News TV segment reported that Maui had lost 25% of its beaches in the last century and that 70% of the State's coastline is threatened. More periods of drought, lower long-term participation, increased ocean acidification and coral bleaching are also major concerns. Declining coral health, the loss of coral and the consequent decrease in coastal protection signals more serious coastal flooding. Currently, coral reefs shelter 38% of Hawaii's coastal areas, a proportion forecast to fall to 11% by 2050 and 1% by 2100.[45]

These concerns have become amplified as visitor numbers reached all-time records pre-pandemic (2019), and the resurgence post-pandemic in 2021-22 contrasted starkly with the relative serenity that the absence of tourism had made apparent. During the pandemic itself, nearshore reefs experienced some recovery and world-class snorkeling destinations such as Molokini Reserve (and Hanauma Bay on O'ahu) experienced a resurgence in aquatic life and water clarity. Likewise, with the resumption of significant tourism in 2021, these trends reversed[46].

As the CEDS Eco-economy Focus Group discussed, a discussion of this cluster is correlated in a number of ways with the impacts of the visitor industry, and the emergence of the cluster and its consciousness in the minds of many residents deserves a review of visitor industry trends over recent years.

[44] The Maui News, July 8, 2022
[45] https://abcnews.go.com/Politics/hawaiis-beaches-disappearing-due-climate-change/story?id=80875435

[46] https://www.mauinews.com/news/local-news/2021/05/scientists-monitor-molokini-as-tourists-return/



Source: Hawai'i Tourism Authority and DBEDT

Following the "Great Recession" of 2008-09, visitor numbers in Maui County increased by more than 50% between 2010 and 2019, from just below 2 million per year to more than 3 million; in comparison, the resident population grew by about 7% during this period. In the decade 2009-19, the number of visitors in Maui County on any given day grew from 43,000 to 68,000, an increase of 58%. After the hiatus during the pandemic, visitor numbers to Maui County reached record numbers due to pent-up demand, stored disposable income, and difficulty in flying internationally. In July 2021, an average of 76,000 visitors were present per day – a ratio of 46 visitors per 100 residents. By comparison, the Maui Island Plan of 2012[47] recommended an optimal ratio of 33 to 100. These numbers may contribute to the unease expressed by some that tourism should be managed responsibly in some form, that some form of environmental levy be instituted to support the Eco-economy, and/or a program of conservation and cultural education or hands-on volunteerism be offered visitors to mitigate impacts and provide a more meaningful experience while vacationing in the County.

[47] https://www.mauicounty.gov/1503/Maui-Island-Plan

Aggregated data for the Eco-economy in Maui County is sparse, as most activities and jobs in this area are distributed across various clusters, for example, Energy, Professional, Scientific and Technical Services, Construction, Remediation Services, Education Services, Leisure and Hospitality, and Government. For Bureau of Labor Statistics occupational data, eco-economy staff are included in part in the Life and Physical Science category, the Forest and Conservation grouping (50 workers earning an average of $40,500), and Landscaping and Groundskeeping (1,480 workers and an average $39,520 per year). Other Eco-economy occupations for Maui County are not specifically disaggregated. A variety of reports (mostly referring to the Green economy) include specific occupations as heating and air-conditioning mechanics and installers, solar PV installers, building retrofitters and remediation workers, recycling and reclamation workers, green waste and composting workers, biomass and biofuel personnel, private, nonprofit and government personnel engaged in natural resource management, conservation and protection, ecosystem researchers and watershed professionals. For analytical purposes and for gaining an understanding of the cluster's true potential, it would be most helpful if state and local agencies collected County-level data specifically for eco-economy occupations.

In 2016, Hawaii Green Growth, a statewide public-private partnership committed to advancing State social, economic, and environmental goals by 2030, launched the Aloha+ Challenge which established a dashboard measuring local metrics towards the global U.N. Sustainability Development Goals (UNSDGs)[48]. Dashboard metrics include Renewable Energy statewide (36% in 2020), Solid Waste Diversion (27% in 2021), Water Recharge, Conservation and Reuse (12m. gallons per day in 2022), and others covering local food production and green workforce and education.

In 2021, DBEDT updated the Hawai'i 2050 Sustainability Plan[49] which included recommended statewide actions over the 2021-30 decade. These are:

- Promote a Sustainable Economic Recovery
- Reduce Greenhouse Gases
- Improve Climate Resilience
- Advance Sustainable Communities
- Advance Equity
- Institutionalize Sustainability Throughout Government
- Preserve the Natural Environment
- Perpetuate Traditional Ecological Knowledge and Values.

[48] www.Alohachallenge.hawaii.gov

[49] https://files.hawaii.gov/dbedt/annuals/2021/2050-sustainability-plan.pdf

As previously mentioned, disaggregated data for Maui County related to the Eco-Economy covering the multiple dimensions presented above are limited. The following table presents some indicators relevant to Focus Group discussion.

Maui County Eco-Economy: Selected Data

	2005	2010	2019/2020
Number of LEED Certified Buildings	3	81	120
Number of Invasive Plant Species Fully Eradicated	n/a	12	21
Acres protected by HLT (HILT)	473	14,692	14,813
Volume of Landfill Trash (tons)	251,678	118,236	144,243
Beverage Containers Returned for Redemption (%)	68% (*2006)*	76%	62%
Sites Monitored for Near-shore			
Water Quality	n/a	n/a	48 *(2018)*
Sites with unsafe levels of:			
Nitrogen	n/a	n/a	42%
Phosphorous			8%
Nitrates			63%
Turbidity			96%

Source: US Green Building Council; HILT; County Department of Environmental Management; Hawai'i State Department of Health; Hui O Ka Wai Ola

Note: Data for Hawai'i Land Trust (HLT) for 2010 and 2019/20 include 11,051 acres of Ulupalakua Ranch that were put into a conservation easement in 2009

Eco-Economy -- SWOT

Strengths

Strong support from residents for environmental protection and conservation
Community action and support for water protection (e.g. Hui O Nā Wai ʻEhā)
Collaboration between, and educational outreach by, conservation groups
Strong sense of community
Dedication of environmental organizations, agencies and nonprofits
Community support to restore fishponds
Connectedness of community to culture, *ʻike kūpuna* (knowledge of one's traditional past)
Availability of natural resources
Outdoor opportunities for K-12 education
UHMC Sustainable Science Management degree program
Good (empathetic) Council members
Other (1 each): Good land protections; MEO presence on Molokai

Weaknesses

Excessive tourism and lack of visitor education on culture and traditions
Low wages for conservation work
Lack of prevention of invasive species at harbors and ports
Lack of inspectors for enforcement
Hawaiian cultural scientists' expertise underused and underrecognized
Development that disturbs sensitive ecosystems
Lack of funding and resources for eco-economy projects
Increasing demand for groundwater development
Insufficient State Division of Conservation and Resource Enforcement staffing
Slow progress of water protection efforts
Lack of recognition for traditional land use under SMA guidelines
Time consuming/cumbersome permitting processes
Wildfires
Diversity of land ownership and kuleana issues complicate natural resource issues
Lack of STEM opportunities
Lack of coordinated development that accounts for environment carrying capacity
Lack of floodplain management
Lack of resilience in large areas of land and natural resources to perturbations
Number of shoreline properties owned by wealthy non-residents and off-islanders
Lack of urgency for climate change action
Inadequate wastewater treatment capacity for both residents and visitors

Lack of integrated water resource management (incl. watershed protection plan)
Lack of representation from Molokai in County-wide discussions
Other (1): Lack of proactive approach by County for prevention of water pollution

Opportunities

Develop a cultural overlay using traditional land use and watershed management in Maui County Code
Impose a visitor industry "Green Tax" to support conservation
Reforestation and urban forestry
Local alternatives for Christmas trees
Increase regenerative agriculture with available ag land
Develop a wetlands overlay to protect wetlands and streams from development
Create a Conservation Campus at site of old Maui High School (Hamakuapoko)
Increase investments in open space to mitigate climate change
Develop curricula to promote environmental science, engineering and STEM jobs
Increase number of, and support for, native plant nurseries
Engage visitors in natural resource management and restoration/conservation tourism
Make permanent dedication of tax credits for conservation efforts
Develop innovative wastewater infrastructure
Establish higher education support to provide STEM jobs in conservation
Use invasive plants and animals as food sources
Establish a tax benefit for planting native trees
Encourage school food programs to use locally raised produce and protein

Threats

Climate change conditions and effects (e.g. droughts, sea level rise)
Invasive plants and animals
Loss of nearshore coral reef habitat
Loss of local knowledge as kūpuna age
Imminent extinction of native birds, insects, and plants/Resulting loss of cultural connections
Unguided tourists using traditional gathering areas for recreation
Increasing light pollution
Improper waste disposal (buried at landfill etc.)
Overuse of natural resources (construction, tourism, etc.)
Lack of biosecurity
Environment out of control – negative impacts across all sectors
Other (1): Contamination of soils from past conventional ag practices

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Energy

(Incl. Renewable Energy)

Priorities and Strategies

Priorities[50]

- **Develop and implement clear pathways for community-led planning and development opportunities and projects (e.g. community solar, shared energy)**
- **Create strategy for a broad and equitable adoption for renewable solutions based on need for households/industries via renewable tax credits and grants**
- **Expand and implement STEAM programs to support student-led community engagement**
- **Expand access to workforce training to support renewable energy and installation projects**
- **Increase infrastructure for electric vehicles**

- Minimize (and at least not add to) regulatory hurdles for renewable energy projects
- Develop new renewable energy resources

Strategies

- Ensure equity: Availability of Renewable Energy to all/Equity of access to energy technology and equity of community environmental impacts
- Develop a Statewide strategic plan for implementing 100% renewables
- Hold more dialogue on energy trade-offs
- Develop strategies for public education and outreach to counter NIMBYism[51]
- Invest in feasibility study for alternatives to oil (e.g. wastewater to algae to fuel; other biofuels; solid waste to energy)
- Employ drones to create 3D mapping for proposed projects and share publicly
- Prioritize public office candidate policies regarding renewable energy as voting criteria

Other (1 each): Create energy investment huis that include participation by renters; Create locked-in energy rates once 100% renewable goal is reached; Plan for retreat from sea-level rise and increase climate resilience.

[50] Priorities in boldface are those with the most consensus by Members of the Focus Group
[51] NIMBY is an acronym for "Not In My Back Yard".

Energy

Cluster Analysis

As MEDB's Trends Maui Nui 2020 report noted, "Maui County has made major strides towards the State's ambitious energy goals: 100% energy from renewable sources and carbon neutral by 2045. However, as Maui County continues its transition, questions remain about how to balance reliability, affordability, resiliency, and equity in its electrical grid."

Like the State of Hawai'i, Maui County continues to be heavily dependent on imported oil for its primary energy needs. As outlined on the Hawaiian Electric (HECO) website, "Electricity prices in Hawaii are generally higher than on the U.S. mainland due to the cost of imported oil used to power many of the islands' generators. The fluctuation in the cost of fuel, which makes up roughly 50 percent of a typical bill, is the biggest driver."

A recent report by DBEDT[52] places developments in Maui County into a broader context. In the period 2002 through 2019, the share of renewable energy for all energy needs (electricity generation, jet fuel, gasoline, residential and other uses) increased from 3.7% to 9.7%, primarily due to the increased capacity of solar and wind energy in electricity generation. In 2019, more than half of Hawaii's total energy needs (57%) was accounted for by the transportation sector, and of that total, jet fuel accounted for 58%; motor gasoline 30%, distillate fuel (diesel etc.) 7%, and residential use 5%.

Hawai'i's Petroleum Use by Sector (2018)

Type	Percentage
Air Transportation	33.9%
Ground Transportation	27.4%
Electric Power Generation	23.6%
Marine Transportation	4.0%
Commercial	2.9%
Residential	0.3%

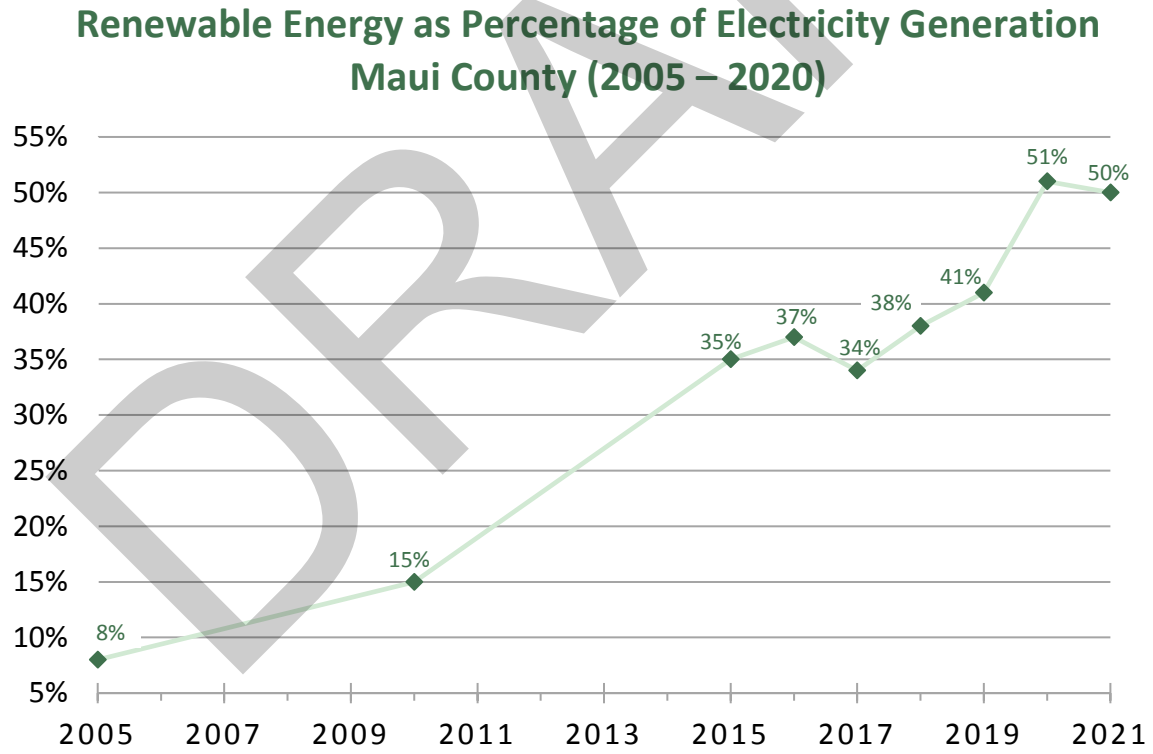
Source: Hawai'i's Energy Facts and Figures, 2020 Edition, Hawai'i State Energy Office

Energy continues as a significant cluster in Maui County, which is a national leader in renewable energy grid penetration. Hawaiian Electric Company (HECO), which merged its subsidiary Maui Electric Company (MECO) as of January 2020, estimates that in 2021, 50% of total energy generation needs were derived from renewable energy sources. This compares with 67% for Kaua'i (2020) and 60% for Hawai'i Island, a number that rose from 43% in 2020 due to the reopening of the geothermal plant in Puna. By comparison, O'ahu reached 33% renewable in

[52] DBEDT, State of Hawaii Energy Data and Trends, , April 2022

2021[53]. The trend in renewable energy supply since 2005, when it accounted for 8% in Maui County has been steadily upwards. The State goal, as articulated through the Hawai'i Clean Energy Initiative (HCEI), is for 100% of electricity generation to come from renewable sources by 2045.

As reported in a recent DBEDT study[54], the importance of Hawai'i's non-utility electricity producers has increased over time. The utility companies (HECO, MECO, HELCO, and KIUC) generated 54% of the total electricity generated by the electric power industry (excluding customer generated electricity) in 2019 and purchased the remainder from independent power producers (IPPs) and combined heat and power (CHPs). This was a 28% point decrease from 1990, when utilities generated 82% of the total electricity sold in Hawai'i. HECO data show that, of Maui County's 50% renewables figure, 26% was generated from commercial wind; 23% from customer-sited solar, mostly rooftop PV (23%), grid-scale solar accounted for 1.4% and biomass for 0.1%. Statewide, 45% of total renewable energy was sourced from customer-sited solar and wind; 22% from commercial wind; 12% from grid-scale solar; 12% from biomass (including waste-to-energy); 6% from geothermal; 2% from biofuels; and 1% from hydro[55].



Source: MECO, Annual Renewable Portfolio Standard Status Reports (2005, 2010 data); Hawai'i State Energy Office (2015-20); HECO (2021)

[53] Data sourced from the Hawai'i State Energy Office and HECO.

[54] DBEDT, Hawai'i's Electricity Industry: 2019-2020 Analysis and Recent Trends, July 2021, https://files.hawaii.gov/dbedt/economic/data_reports/reports-studies/ElectricityTrendsReport2021.pdf

[55] https://www.hawaiianelectric.com/clean-energy-hawaii/our-clean-energy-portfolio

HECO also reported that as of March 31, 2022, there were 14,917 installed PV systems in Maui County, 92% of which were residential and 8% commercial. These systems accounted for 141 megawatts (mW) of capacity, 59% of which came from residential PV, and 41% from commercial[56]. One other major difference in the energy cluster since the 2016 CEDS report has been the closure in December 2016 of Hawaii Commercial & Sugar (HC&S), the last active sugar company in the state, which produced 4mW of energy in 2015 to the grid from a mixture, mainly of bagasse (sugar cane fibrous residue after crushing the cane), and also coal and hydro. Maui County's Energy cluster is lacking in terms of published employment, occupational and wage data. Employment numbers produced by the Hawaii Department of Labor and Industrial Relations (DLIR) aggregate Utilities with Transportation and Warehousing. In 2021, this cluster accounted for 3,700 jobs (500 in air transportation). HECO, the largest energy employer in Maui County, was staffed by over 300 workers as of 2021. A recent DBEDT report on emerging industries[57] noted that one such industry in 2016, Alternative Power Generation, was now declining as a source of employment with less than half the number of jobs in 2020 compared with 2016.

In terms of the DLIR job count, occupations related to energy are included in the Construction sector, as well as Technical Services in the Science and Technology sector. One estimate for energy sector jobs in the State was given in a 2020 Energy and Employment report issued by the National Association of State Energy Officials. This gave an estimate of about 20,000 people employed in the cluster, with about one-third in electrical power generation, 30% in energy efficiency, 20% in transmission, distribution and storage, and a similar proportion in fuels. The report also stated that Hawai'i was experiencing difficulty in filling most positions due to a limited application pool and lack of experience, training and skills. Another report, the Solar Jobs Census of 2019, estimated that Hawai'i was 5th in the nation for solar jobs per capita, with a total of about 2,500 jobs, three-quarters working on installation.

[56] https://www.hawaiianelectric.com/clean-energy-hawaii/our-clean-energy-portfolio/quarterly-installed-solar-data
[57] Hawai'i's Targeted and Emerging Industries: 2021 Update Report, December 2021. https://files.hawaii.gov/dbedt/economic/data_reports/emerging-industries/Hawaii_Targeted_Emerging_Industries_2021_Update_Report.pdf

Maui County Utility Data (2010 – 2020)

	2010	2015	2020
Maui Island			
Number of Residential Customers	62,992	65,603	68,286
Average Rate per kWh	$0.295	$0.310	$0.333
Molokai			
Number of Customers	3,146	3,212	3,269
Average Rate per kWh	$0.358	$0.376	$0.354
Lānaʻi			
Number of Customers	1,636	1,718	1,749
Average Rate per kWh	$0.371	$0.376	$0.364

Source: Maui County Data Book 2012, 2016, 2020

With population growth in the County over the period, customer numbers grew as expected. Interestingly, the discrepancy in rates between Maui Island and Molokai and Lāna'i narrowed. While Maui's rates increased by 13% over the period, those for Molokai and Lāna'i both fell; however, they still remained slightly higher than Maui Island in 2020. However, new rates effective from June 2022 show significantly increased rates reflecting the recent jump in oil prices. These range from 42.5 cents to 45.4 cents per kWh depending on usage for Maui Island customers; 56.2 cents to 60.0 cents for Molokai; and 57.7 cents to 60.9 cents for Lāna'i.
It is worth noting that DBEDT data show the average rate in the U.S. as 10.7 cents per kWh[58].

Average Monthly Residential Bill, Maui County by Island (2011 – 2019)

Year	Maui	Lānaʻi	Molokai
2011	$219	$192	$161
2013	$211	$199	$153
2015	$168	$159	$115
2017	$157	$150	$115
2019	$183	$195	$133

Source: Hawaiʻi Energy Facts and Figures, 2020 Edition, Hawaiʻi State Energy Office

Energy conservation efforts have also made an impact, reducing overall energy consumption. In 2005, annual average residential usage was 8,967 kWh, and by 2020, it was 6,122 kWh, a reduction of more than 30%; Molokai and Lānaʻi made even greater strides. (This downward trend also reflects the drop in demand due to COVID-19 and its effect on the economy). However, with the climate warming and disposable income rising, air conditioning use has

[58] https://dbedt.hawaii.gov/economic/energy-dashboard/

increased, countering strides made in energy conservation. In 1970, only 2% of Maui residents has air-conditioning; by 2014, 44%, and by 2019, 53%.

Transportation Energy Data, Maui County (2005 – 2020)

	2005	2010	2015	2020
Number of Licensed Drivers	102,050	110,420	114,569	121,224
***Number of Vehicles Registered* (a)**	160,277	154,276	176,034	186,866
Passenger Vehicles	125,169	118,945	138,937	148,660
All Other Vehicles	35,108	35,331	38,097	38,206
Gallons of Motor Fuel Consumed	69.3m	61.7m	68.8m	73.9m
Average Annual Vehicle Miles	10,932	8,913	8,881	8,497

Source: Hawai'i Department of Transportation
(a) Data for 2019

Maui County driver numbers reflect the increase in population, and although fuel consumption follows a cyclical trend, 2020 numbers almost certainly take pre-pandemic data into account given the lighter road traffic and lack of rental cars.

Notably, one energy company on Maui spans the Energy, Agriculture, Eco-economy, and Science, Technology and Innovation clusters: Pacific Biodiesel. Founded on Maui Island in 1995, the company is the longest operating biodiesel producer in the U.S. and opened the first retail biodiesel pump in the nation. It remains the only commercial producer of liquid biofuel in Hawai'i. Pacific Biodiesel's focus is a "circular economy" model of sustainability that addresses climate change concerns with recycling (for example, used cooking oil) and developing value-added co-products from biofuel crops such as sunflower oil for cooking and beauty oils and products. The company has an agricultural operation in Waikapū, on former HC&S land now leased from Mahi Pono, with several acres of sunflowers rotated with nitrogen-fixing cover crops. These colorful, uplifting fields proved a social media phenomenon when first planted in 2017 and have remained a draw intermittently for residents and visitors alike. In June 2022 Pacific Biodiesel opened its first off-grid fueling station at the Mā'alaea small boat harbor in a public-private partnership with DLNR to provide marine customers as well as on-road and off-road sales.

Energy -- SWOT

Strengths

Community commitment to the Hawaii Clean Energy Initiative (HCEI) goal of 100% renewable energy by 2045
Continued support for State renewable energy tax credits
Quality and quantity of seasoned energy developers willing to invest in Maui County and create renewable energy projects
Native Hawaiians and their indigenous value system
The people of Maui County and its youth
Abundance of solar energy
Over half of Maui County's energy derived from solar and wind
National leadership in EV ownership per capita
Wind renewable projects
MEDB's Hawai'i (formerly Maui) Energy Conference
UH Maui-Sustainable Living Institute of Maui (SLIM) programs for workforce education
High cost of energy encouraging development of renewables
New workforce program opportunities (especially on Molokai)

Other (1 each): Existing wind farms as proven model; MEDB leadership in renewable energy.

Weaknesses

Scarcity and unaffordability of renewable energy opportunities for many – only the privileged benefit
Time-consuming and costly regulatory permitting processes leading to lack of motivation/ Regulatory bodies and Government act too slowly on renewable projects
Recent loss of 2 large solar farm projects
Length of lead-times for equipment and materials
Lack of trained workforce
Lack of EV public charging stations and economic viability
Lack of State tax credits for EVs
Approaching obsolescence of Kahului and Maalaea power plants
Scale of NIMBY opposition to renewable projects
Prohibitive cost of shipping and fuel for building utility-scale solar projects
Lack of local renewable companies and installers/Lack of solar companies traveling to neighbor islands
Utility (HECO) business model of profit and extraction
Slowness of utility upgrades to grid for renewable integration
Geographic isolation, scarcity and costs
Principal focus on "big energy"
Clean energy initiatives (e.g. Molokai grid) behind schedule

Misinformation by groups relating to renewable energy

Other (1 each): Above ground transmission lines; Maui County multi-island Plans create challenges as no "one size fits all"; solar output reduced by clouds.

Opportunities
Shared energy (e.g. community solar)
Renewable energy workforce training
Homeowner reimbursement for energy production expansion to Lānaʻi
Alternative fuels
Solar panel cleaning and inspection services
Creation of energy strategy plan for each island In County
Community owned and developed renewable energy projects
Agri-voltaic ventures providing alternative income for farmers
Job creation via project operation and maintenance
Subsidize rental property solar projects to benefit tenants
Geothermal project potential
Build climate-resistant infrastructure
Smart technology
State goal of 100% renewables by 2045

Other (1 each): More distributed energy and grid services; Drone inspection for energy facilities; Adoption of grid-forming strategies; Pro-active support by County and MEDB of utility-scale renewable projects; Election year possibility to elect candidates that pro-actively support renewables.

Threats
Senate Bill 2510 that limits the types of renewable energy Hawaiʻi can pursue[59]
State Energy Office lacks leadership to promote and educate public about renewables
Supply chain disruptions
Declining Federal tax credits
NIMBY opposition delaying or threatening renewable permit approvals
State administration lacking pro-active leadership in advancing utility-scale solar projects
Hawaiʻi's reputation and reality as business-unfriendly
Slow speed of permitting processes
Cost of fossil fuel and unpredictable pricing and availability
Oil supply scarcity and prone to conflict
Increased threat to transmission from fire, floods and storms
Continued focus of utility on profit over innovation
Lack of residents' knowledge and understanding of renewable development
Increases in shipping costs
Tax benefits accruing only to for-profit sector

[59] Subsequently vetoed by Governor Ige in July 2022.

Excessive salaries and bonuses for utility (HECO) executives
Effects of sea-level change for infrastructure

Other (1 each): Lack of County investment towards renewable energy; Increased regulatory control (permits, rules, etc.)

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Hawaiian Knowledge and Culture

Priorities and Strategies

Priorities[60]

- **Increase funding opportunities and access to capital for Native Hawaiian owned businesses**
- **Apply indigenous knowledge and innovation across all economic sectors and `āina-based organizations**
- **Advocate for Department of Hawaiian Home Lands (DHHL) clearing their waitlist**
- **Reduce impacts of visitors through a clear assessment of carrying capacity analysis and support a Hawaiian-led, Hawaiian culture-based authority committed to `āina, environmental impacts and our people**
- **Support expansion of Hawaiian culture and ōlelo within an accessible education system from keiki to kūpuna**

- Promote tourism education and management ("respect the culture and place") at airports, hotels, car rental, etc.
- Fund land acquisitions to protect cultural and natural resources in perpetuity
- Establish a County Department of `Ōiwi Resources
- Create affordable housing for kānaka

Other (1 each): Support the construction of Hālau of 'Ōiwi Art in Wailuku; Require strong pa'akai

Strategies

- Integrate Hawaiian healing methodologies and knowledge into healthcare systems (incl. mental health)
- Create pathways to prioritize practitioners as local experts for all Hawaii-based studies and projects
- Facilitate the cultural conversation for enduring community-based solutions
- Support community organizations involved in `āina and/or kai-based kuleana work
- Indigenize innovation and entrepreneurship
- County to support better community engagement and communication
- Fund kūpuna to visit schools to share their mo`ōlelo with our keiki
- Establish consent for use and fair compensation for `ōiwi intellectual property

[60] Priorities in boldface are those with the most consensus by Members of the Focus Group

Hawaiian Knowledge and Culture

Cluster Analysis

In recognizing "the Hawaiian renaissance movement taking shape throughout Hawaii,[61]" this cluster has been identified by the Maui County CEDS Strategy Committee for the first time as a rightful driver of economic development that also overlays all of the other clusters. Central to Hawaiian knowledge and culture is the profound connection with the natural world, the native land and resources. For hundreds of years, Native Hawaiians have coevolved with this environment and through ancestral research and observation and the application of natural science and cultural values, have accumulated deep knowledge and understanding of their environment. This sophisticated culture and the traditions perpetuated through the generations provides to the present day a foundation and unique worldview that is integral to the concept of a community that is pono – one that is balanced, righteous, fair and aligned.

For many of Hawaiian heritage, the challenges of perpetuating Hawaiian values, traditions and culture, and ensuring the welfare of the Hawaiian community while thriving in a modern global economy are daunting. Setting an economic context in Maui County is challenging because disaggregated data is limited. In terms of population, decennial census data show that Statewide, 11% self-report as Native Hawaiian or Pacific Islander. In combination with at least one other race, the proportion is 27%.

Native Hawaiian and Other Pacific Islander (P.I.) Population State of Hawai'i (2000 – 2020)

	2000	2010	2020
Total State Population	1,211,537	1,360,301	1,455,271
(a) Native Hawaiian & P.I.	113,539	135,422	157,445
As Percentage *(%)*	9%	10%	11%
(b) Native Hawaiian & P.I.	282,667	355,816	394,102
As Percentage *(%)*	23%	26%	27%

Source: U.S. Census Bureau
(a) Census respondents self-reporting as Native Hawaiian or P.I. alone
(b) Census respondents self-reporting as Native Hawaiian or P.I. alone or in combination with one or more ethnicities
Note: 2020 Census data for Maui County reports 10.6% of population self-reporting as Native Hawaiian or other Pacific Islander alone; Pacific Islanders account for 3.0%

[61] This phrase from the website of Hawai'inuiākea – School of Hawaiian Knowledge at UH Manoa.

Based on Census Bureau data, the Office of Hawaiian Affairs (OHA) estimates that as of 2017, there were over 614,000 individuals of Native Hawaiian ethnicity in the United States population.

Using the broader definition of "Native Hawaiian or Pacific Islander" to include that ethnicity alone plus those individuals self-reporting as Native Hawaiian in combination with one or more other ethnicities, proportions by County in the State were as follows in 2010:

Native Hawaiian Population, State of Hawai'i by County (2010)

	Native Hawaiian/PI	Total Population	Native Hawaiian/PI as Percentage *(%)*
Maui County	36,804	154,924	23.8%
Honolulu (O'ahu)	182,120	953,207	19.1%
Hawai'i	54,919	185,079	29.7%
Kaua'i	16,127	67,091	24.0%

Source: U.S. Bureau of the Census and OHA. (2020 Census data by ethnicity and island not yet available)
Note: Data show Census respondents self-reporting as Native Hawaiian alone or in combination with one or more ethnicities

Native Hawaiian Population, Maui County (2010)

	Native Hawaiian/PI	Total Population	Native Hawaiian/PI as Percentage *(%)*
Maui County	36,804	154,924	23.8%
Maui Island	31,666	144,444	21.9%
Molokai	4,527	7,345	61.6%
Lāna'i	611	3,135	19.5%

Source: U.S. Bureau of the Census and OHA. (2020 Census data by ethnicity and island not yet available)
Note: Data show Census respondents self-reporting as Native Hawaiian alone or in combination with one or more ethnicities

Labor force data such as job count by industry or occupation are not collected by ethnicity. However, a recent Statewide DBEDT report on Native Hawaiian Entrepreneurship[62] included data drawn from the American Community Survey (ACS) conducted annually by the Census Bureau that provides broad categorization by type of sector worker:

[62] "Hawaii's Native Hawaiian Entrepreneurs", DBEDT, January 2021.

Class of Workers in Hawai'i: Population 16 Years and Over

Class of Worker	Native Hawaiian *(a)*	Total Population
Private Sector	71.8%	65.1%
Government	21.2%	23.7%
Self-Employed	6.3%	10.8%
Working without Pay	0.7%	0.4%

Source: DBEDT and U.S. Census Bureau (ACS)
(a) Self-reporting as Native Hawaiian alone or in combination with one or more ethnicities

As this table shows, Native Hawaiians are more likely to be employed in the private sector and less likely to hold a job in the government sector or be self-employed. The report included a breakdown of more than 10,000 Native Hawaiian entrepreneurs, defined a self-employed in their own business, professional practice, or farm. As the report notes, entrepreneurs are the engine of economic growth, creating jobs and spawning innovation. The leading three industries accounting for 44% of all Native Hawaiian entrepreneurs were Construction; Administration, Waste Management, and Remediation Services; and the catch-all grouping of Other Services. They were less likely than other entrepreneurs to be in the Science and Tech cluster, or the real estate field.

Industries of Hawaiian Entrepreneurs, Statewide

Industry	Native Hawaiian Entrepreneurs	All Entrepreneurs in Hawaii
Total Number	**10,193**	**88,282**
Construction	15.7%	12.5%
Admin/Waste Management/Remediation	14.5%	8.9%
Other Services *(excluding Public Admin)*	13.9%	11.1%
Healthcare and Social Assistance	9.1%	9.3%
Retail Trade	8.4%	7.8%
Professional/Science/Tech	5.8%	12.2%
Agriculture/Forestry/Fishing	5.0%	4.2%
Wholesale Trade	4.7%	2.9%
Real Estate/Rental/Leasing	4.5%	7.3%
Arts/Entertainment/Recreation	4.4%	4.8%
Manufacturing	4.2%	3.2%
Transportation and Warehousing	2.2%	3.9%
Accommodation and Food Services	1.6%	4.8%
All Other	6.0%	7.1%
Subtotal	**100%**	**100%**

Source: U.S. Census Bureau (ACS)
Notes:
1. Entrepreneurs defined as self-employed in own business, professional practice, or farm
2. Native Hawaiian refers to self-reporting as Native Hawaiian alone or in combination

OHA Statewide income data for the Native Hawaiian population over the period 2010-19 demonstrate a broadly consistent relationship, with the Native Hawaiian median household income generally in a range 5 to 10% lower than for the population as a whole.

Native Hawaiian Median Household Income (MHI) as Percentage of Hawaii Statewide MHI (2010 – 2019)

Year	Native Hawaiian MHI	State MHI	Native Hawaiian as Percentage of state MHI *(%)*
2010	$59,755	$63,030	94.8%
2011	$59,532	$61,821	96.3%
2012	$60,415	$66,259	91.2%
2013	$65,688	$68,020	96.6%
2014	$62,852	$69,592	90.3%
2015	$75,381	$73,486	102.6%
2016	$70,455	$74,511	94.6%
2017	$72,363	$77,765	93.0%
2018	$75,708	$80,212	94.4%
2019	$73,065	$83,102	87.9%

Source: OHA and Bureau of the Census (ACS)
Note: MHI data in inflation-adjusted dollars

A joint 2020 study examined the impacts of the COVID-19 epidemic on Native Hawaiian businesses[63]. Some of the main findings are summarized below:

Native Hawaiian Businesses: Data, and Impacts of COVID-19

Types of Businesses	Number of Businesses
Total Small Businesses in Hawai'i, 2020	135,567 *(Source: SBA)*
Native Hawaiian Owned Businesses in Hawai'i	13,147 *(11.1% of all businesses)*
Of which percentage in the Arts, Entertainment and Recreation Cluster *(%)*	17.1%
Accommodation and Food Services	5.9%
Native Hawaiian Owned Businesses with Employees	1,202 *(9.1%)*

[63] "Data Show Sudden, Severe, and Lasting Impacts of COVID-19 on Native Hawaiian Businesses", Issue Brief, Hawai'i Islands Native Chambers of Commerce, OHA Systems Office, Lili'uokalani Trust, Kamehameha Schools Strategy and Transformation Group, May 2020 https://19of32x2yl33s8o4xza0gf14-wpengine.netdna-ssl.com/wp-content/uploads/NH-Businesses-and-COVID_final_May2020.pdf

Online survey of 1,044 Business Owners in April 2020 by NHCoC and OHA:

- Decline in customer/client demand (53%)
- Depletion of cash reserves (49%)
- Business closed temporarily (48%)
- Event cancellation (34%)

Take-aways for Native Hawaiian-owned businesses:

- Less dependent on tourism than Non-NH Owned and more resilient
- Need for greater access to capital is a long-standing challenge
- Need for technical assistance to manage the business

The latest 15-year Strategic Plan published by the Office of Hawaiian Affairs covers the period 2020-2035[64]. The plan contains four main themes: Educational Pathways, Health Outcomes, Quality Housing, and Economic Stability. The principal recommendations regarding economic stability are as follows:

- Advance policies, programs and practices that strengthen ability to pursue multiple pathways toward economic stability:
    - Increase number/percent Native Hawaiian ʻohana who are able to provide high-quality keiki and kūpuna care
    - Increase access to capital and credit for community strengthening Native Hawaiian businesses and individuals
    - Increase number of Native Hawaiian ʻohana who are resource stable (e.g. financial, subsistence, other)
    - Increase Native Hawaiian employment rate
- Cultivate economic development in and for Hawaiian communities:
    - Increase the number of successful, community strengthening Native Hawaiian-owned businesses
    - Establish new markets for Native Hawaiian products (e.g. kalo, loko i'a grown fish) that can provide Native Hawaiian producers a livable wage
    - Establish and operationalize an Indigenous economic system consistent with Native Hawaiian knowledge, culture, values, and practices

Other main recommendation of the Strategic Plan are:

Educational Pathways

- Support development and use of educational resources for all Hawaiian lifelong learners in schools, communities and 'ohana
- Support education through Hawaiian language medium and focused Charter Schools

Health Outcomes

- Advance policies, programs, and practices that strengthen Hawaiian wellbeing, including physical, spiritual, mental and emotional health

[64] https://19of32x2yl33s8o4xza0gf14-wpengine.netdna-ssl.com/wp-content/uploads/Mana-i-Mauli-Ola.pdf

- Advance policies, programs and practices that strengthen the health of the ʻāina and mo'omeheu

Quality Housing

- Advance policies, programs, and practices that strengthen Hawaiian resource management knowledge and skills to meet the housing needs of their ʻohana
- Support implementation of the Hawaiian Homes Commission Act and other efforts to meet the housing needs of ʻohana

Hawaiian Knowledge and Culture -- SWOT

Strengths

Emerging Native Hawaiian leaders and educators (incl. kiaʻi)
Many outstanding kumu hula and other Native Hawaiian practitioners in Maui County
Ahupua`a resource management systems
Strong County Council members supportive of cultural initiatives and projects
Native Hawaiian role models/kūpuna for youth and lāhui
Hui O Nā Wai ʻEhā
Better efforts to perpetuate Hawaiian ʻike and ʻōlelo Hawaii
Emerging (and potential) industries and opportunities in Ag, Eco-tourism, cultural and holistic health retreats, etc.
Variety of Native Hawaiian and culturally focused community groups and non-profits
Hawaiian values in business
A vested population that cares and supports the economic progress of authentic Hawaiian culture
Rich natural resources (e.g. ocean, fresh water, soil, etc.)
Active communities and many people knowledgeable about our natural resources
Increasing interest in the restoration of lo`i and loko i`a
Diverse cultural schools and knowledge

Other (1 each): Cultural position in Mayor's Office; Sense of "home" for many; Cultural mapping, iwi and archaeology database

Weaknesses

Over-reliance on tourism/poor tourism management
Poor natural resource management/diminishing natural resources
Dearth of Native Hawaiian-owned businesses and support-resources to establish them
Too many water diversions
Displacement of kānaka maoli
Too many luxury homes and real estate lobbyists
Cultural practitioners not contracted or patronized
Native Hawaiian homelessness and inability to resolve
Lack of cultural practitioners helping address mental health issues
Cultural appropriation and tokenism if Hawaiian culture in tourist industry
Extractive economy
Lack of high-paying jobs/need to raise minimum wage
Government disconnected from Hawaiian knowledge and culture
Need for stronger Ka Paʻakai analysis
Too many Native Hawaiians/Polynesians in prison system
Rural job opportunities but urban living prices
Lack of ʻāina-based organizations
Lack of mental health facilities, especially for extreme cases needing institutionalization
Complex and lengthy process for permitting and establishing new businesses

Lack of aquaculture
Investment in declining industries
Disconnect between programs and target groups
Lack of Hawaiian charter schools
Lack of data on Native Hawaiian businesses in Maui County
Lack of small business education on tax benefit programs
Innovation/entrepreneurship sector shaped by and perpetuates colonial mentality and capitalism
Cost of housing and utilities

Other (1 each): Poor communication between Film Office and local media producers; Food regulations (e.g. processing deer, milk, etc.) Influence of developers; Healthcare workforce shortage and reliance on outsourcing/importing staff

Opportunities
Sovereignty
Empower and inspire kanaka youth to be positive community role models
Abolish the Hawaii Tourism Authority
Establish more Hawaiian language and charter schools
Create and strengthen links between cultural connection and healthcare outcomes
Improve protection of indigenous intellectual property rights
Design a sustainable business ecosystem aligned with Hawaiian values
Halt the construction of luxury homes
Increase taxes on tourism industry and use funds raised for community investment
Employ local experts and practitioners instead of outsourcing
Elect leadership that supports the advancement of Hawaiian culture and knowledge
Support land acquisitions with high cultural and environmental value and protect in perpetuity
Reforestation with native plants
Reduce/minimize stream diversions
Transition focus from tourism to conservation
Incentives for film and TV productions in Maui County
Promote Native Hawaiian involvement for ʻike kūpuna and cultural preservation
Create community based Aha Moku systems in Maui County
Promote sustainability and food security measures to reduce reliance on food imports
Invest in spaces for cultural practices
Cultural sequestration

Other (1): Availability of open/green space

Threats
Displacement/outmigration of kānaka and increasing in-migration of real estate buyers with no ties to ʻāina
Invasive species (esp. deer) that threated native ecosystems
America and the military

Tourism; no clear plan to balance over-reliance
Simplification of Hawaiian culture and cultural misappropriation
Over-diversion and extraction of freshwater
Quiet title
Avoidance of difficult cultural conversations
False narrative that all Hawaiians must agree before taking action on issues
Real estate industry
Overpopulation and overdevelopment
Status quo
Lack of understanding of central role Native Hawaiians have in our community
Greed, apathy and selfish ambition
Out-of-state businesses using tax credits and repatriating State and County tax revenues
Homeless sent here from Continental U.S.
Lack of high-paying jobs
Desecration of burials/iwi kūpuna
Dredging and sand mining
Drug abuse and lack of access to mental health treatment
WWOOFing[65] farms and exploitative business practices

[65] World Wide Opportunities on Organic Farms organization

Healthcare and Wellness

Priorities and Strategies

Priorities[66]

- **Build a streamlined, predictive model with proper tools to anticipate and prepare for future healthcare workforce needs of our community**
- **Pilot people-focused (not insurance company based) delivery model and prepare to scale**
- **Develop and grow a hui of Community Healthcare Workers as the first line of triage for improving the social determinants of health that includes mental health**
- **Expand mental health services across Maui County**
- **Promote further collaboration of healthcare providers and sectors to facilitate cross-pollination**
- **Create incentives for improved recruitment and retention such as housing**

Strategies

- Prioritize development at UHMC of specific programs to match community future needs
- Utilize and reach outside Maui County for trainings and education via the UHMC system
- Fund a County-wide Health Impact Assessment to focus on the social determinants of health in the community rather than focusing on illness
- Influence Statewide legislative changes to support a healthier sector
- Promote wellness by exploring a community group/visit model for mutual support within the community

[66] Priorities in boldface are those with the most consensus by Members of the Focus Group

Healthcare and Wellness

Cluster Analysis

As the Maui County General Plan[67] states, "Obtaining quality health care is an essential part of every resident's life and will continue to grow in importance as Maui's population ages. The traditional and alternative medicine sectors are identified as growth sectors, and opportunities exist to create a robust niche industry that can provide viable employment. To build a solid foundation for the provision of quality health care services, including mental health and substance abuse services, and realize the economic potential of these sectors, Maui needs to develop and provide access to a comprehensive and integrated spectrum of health care services and improve the quality of medical facilities."

Forward planning for the Healthcare cluster firstly requires analysis of demographics for Maui County. Maui's population is aging, and at a faster rate than statewide. In 2020, the median age was 42.0 years, compared to 39.6 years in 2010 and 36.8 years in 2000. Over this period, Maui County has seen a greater in-migration of older workers and retirees and the consistent loss of young adults for education and work opportunities to the Continental U.S. This trend has been exacerbated during the COVID-19 pandemic by an outmigration of younger cohorts who suddenly found themselves without a job as the County's service industry temporarily closed down and unemployment reached 34%, the highest rate in the nation. By 2020, over 19% of the Maui County population was over 65 years old, compared with 13% in 2000. The comparison between the proportion of seniors (65+) to those of working age (25-64) in Maui County between 2010 (22%) and 2022 (36%) is even more dramatic. The number of births in the resident population has steadily fallen from a peak of 2,174 in 2009 to 1,794 in 2020, despite the rise in overall population numbers.

Nationally, the peak birth years for baby boomers were the mid- to late-1950s, so that together with Maui County's recent elevated in-migration trend, the 2020s will see increasing numbers in older age cohorts likely requiring age-related healthcare. Leaders in the County's healthcare system clearly articulate the need to begin restructuring the Healthcare system for the needs of the community in 10 to 20 years' time and beyond, which will require a radical change in the healthcare delivery system. Training for building a workforce for a home- and community-based healthcare service requires both planning and funding. Under the current system, Medicare reimbursements have fallen in real terms while upward pressure on wages and costs intensifies. For existing kūpuna care facilities, for example, Medicaid patients do not generate positive cash flow. Under the current system, valuable hospital beds are likewise occupied by

[67] Maui County General Plan 2030, Maui Island Plan

kūpuna needing longer-term care, restricting healthcare system flow-through and limiting capacity for primary care patients. Some professionals in the cluster express concern that under present trends, a demographic increase in the number of resident seniors' long-term care facilities with scant or no resources, dependent on an inadequate Medicare/Medicaid system, will result in forced homelessness -- an image that defies contemplation.

A critical shortage of medical professionals in Maui County has grown over the last few years. A recent blog post on the Maui Health website notes[68] that Maui has faced hospital staffing shortages for a while, worsened by the high cost of living, high housing costs and the lack of affordable housing options. The article notes that communities are facing similar issues across Hawai'i and the U.S., but Maui County's real estate market makes matters even more acute. A recent MEDB report[69] cited the ratio of Maui County residents to practicing physicians in 2019 as 557 to 1, compared to the national average of 338 to 1. Medical providers in the County find that difficulty in recruiting even affects high-paid healthcare occupations such as physicians. The healthcare staff shortage preceded COVID-19, but the pandemic caused more strain on the healthcare system and caused more burnout for medical staff.

A recent report by the Hawaii State Center for Nursing estimated that the state currently has a shortfall of 513 physicians, 212 physician assistants (there are no training courses currently offered in Hawai'i) and 396 advanced practice registered nurses. The publication NursingEducation reported on a data analysis of the 15 counties in the nation with the largest shortage of healthcare workers, conducted in 2021 by the Federal Health Resources and Services Administration (an agency of the U.S. Department of Health and Human Services). Maui County was 5th worst in the entire nation (Hawai'i County was 3rd worst, and Kaua'i 13th.)[70] The Hawaii Physician Workforce Assessment Project estimates that the State of Hawai'i needs at least 750 doctors, especially in primary care specialties. The shortfall in Maui County and Hawai'i County is the most severe, at 40%[71].

A recent UH-Manoa study reported in The Journal of Health and Social Welfare[72] that 23% of nurses in Hawai'i surveyed in 2020 were considering leaving the workforce due to the pandemic, and of these the leading reasons were issues of safety, job fatigue, retirement

[68] https://www.mauihealth.org/blog/posts/maui-health-still-facing-vacancies/ March 7, 2022
[69] Focus Maui Nui, Trends Maui Nui 2020
[70] https://stateofreform.com/news/hawaii/2021/06/a-sustainable-solution-to-hawaiis-physician-workforce-shortage/
[71] https://mauinow.com/2022/07/09/bills-help-address-the-physician-workforce-shortage-especially-on-the-neighbor-islands/

[72] https://mauinow.com/2022/06/18/uh-study-23-of-hawaii-nurses-are-considering-leaving-workforce-due-to-pandemic/

considerations, and a lack of desire to remain a healthcare provider. Two other surveys reported similar findings; the first, conducted by the Washington Post and Kaiser Family Foundation found that 28% of nurses expressed a desire to quit. A 2021 survey by the Hawai'i State Center for Nursing found that 25% of nurses felt so stressed they were considering leaving the profession. A KITV (Honolulu) segment in May 2022[73] reported that healthcare shortages were not just affecting physicians and nurses; shortages were also being experienced in healthcare occupations such as medical assistants, ancillary support workers, pharmacy technicians and medical billers and coders. The President of the Hawai'i Medical College, the only accredited institution in the State producing Medical Assistant graduates, elaborated that in the past, Hawai'i hospitals would recruit between 300 and 500 graduates annually, but currently the number of graduates has fallen to only 200 per year. This trend is attributable in part to COVID-19 concerns and reflect a workforce pipeline issue experienced in the Maui County healthcare cluster with high school student and HOSA programs being negatively affected by the lack of internships, job shadowing and mentoring programs that were offered before the pandemic. The workforce pipeline has been constricted.

A further factor affecting the shortage of healthcare professionals, especially for physicians, are the Medicare reimbursement rates in Hawai'i which are among the lowest in the nation. According to the Hawai'i Physician Shortage Crisis Task Force[74], Hawai'i medical providers receive similar reimbursement rates as Ohio providers despite the significant difference in the cost of living. One solution proposed is to exempt medical services in Hawaii from the General Excise Tax (GET) but a bill to this effect in the State Legislature stalled recently. One outcome from the CEDS Healthcare Focus Group was a call to change the current healthcare model that is driven by insurance company reimbursements.

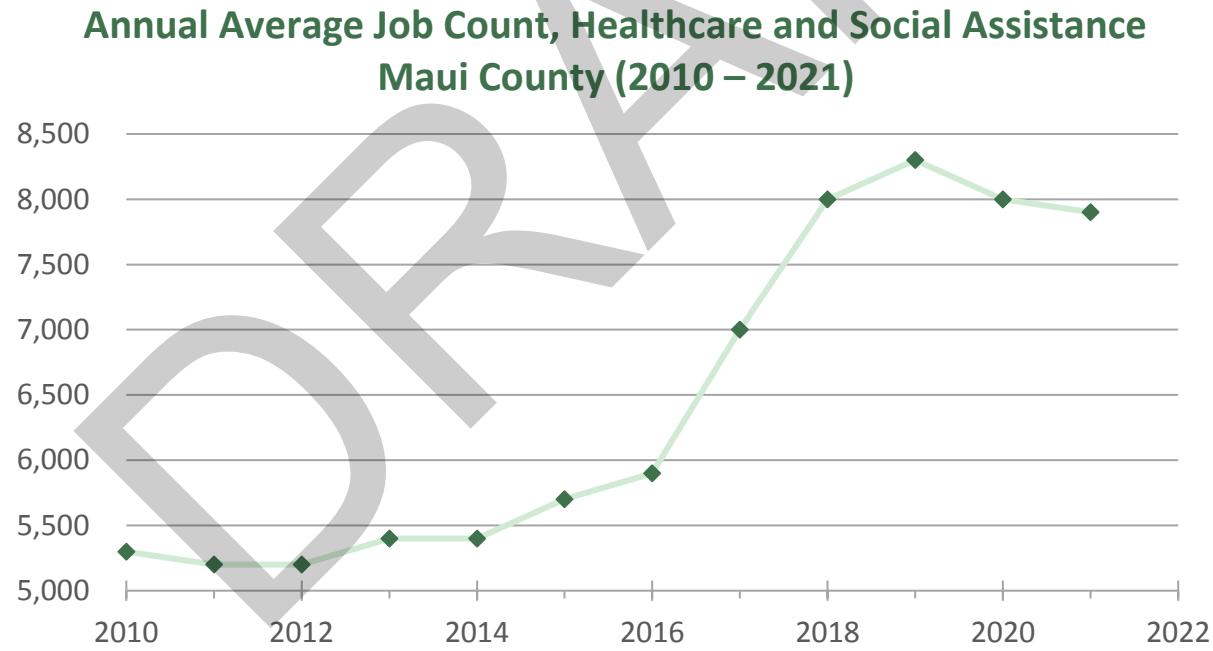
Solutions to mitigate both the structural imbalances of the cluster and the chronic staff shortages over the longer-term include expanding home health. "Hospital at home" is increasingly a model in some communities in the Continental U.S. based on wellness programs to pre-empt hospital and clinic visits. The model requires training of community health workers able to make assessments of health determinants. In Hawai'i, for example, healthcare personnel could also be trained to help individuals navigate health service resources in a culturally appropriate fashion, with trained nurses and nursing aides making home visits, which would be a far cheaper option than the current system. In addition, expanded healthcare curricula in middle and high schools, such as those currently in place at Maui High School,

[73] https://www.kitv.com/news/local/hawaii-nurses-not-the-only-healthcare-workers-in-short-supply/article_de04ee24-d0e6-11ec-ad92-8b8927166887.html

[74] https://stateofreform.com/news/hawaii/2021/06/a-sustainable-solution-to-hawaiis-physician-workforce-shortage/

should also be considered. Another initiative could be modeled after a program at the Kahuku School Health Learning Center on Oʻahu, with students mentored to interact with kūpuna in the community healthcare system. This type of exposure reaches those students who don't yet know they have a calling in healthcare professions.

Other initiatives have been proposed to address the healthcare workforce crisis in Maui County, made all the more urgent because of the aging population; the number of seniors has increased by 87% since 2005. Among these are proposals for affordable housing specifically designated for healthcare professionals in perpetuity, such as the 16-lot plan in Maui Lani – close to Maui Memorial Medical Center – proposed by the Mayor's office in March 2022[75]. Two bills addressing the issue – with special reference to the Neighbor Islands -- were signed into law by Governor Ige in July 2022[76]. Senate Bill 2597 allows more loans to medical students and some debt forgiveness in exchange for a commitment to remain in Hawaiʻi to practice (83% of loan re-payers remain in Hawaiʻi). Senate Bill 2657, also passed into law, funds expansion of medical residency at the John A. Burns School of Medicine at UH-Manoa and medical student training opportunities on Neighbor Islands.



Source: DLIR

[75] https://www.mauinews.com/news/local-news/2022/03/workforce-housing-proposed-for-health-care-personnel/

[76] https://mauinow.com/2022/07/09/bills-help-address-the-physician-workforce-shortage-especially-on-the-neighbor-islands/

Despite the workforce issues, the Healthcare and Wellness cluster has been the fastest-growing economic driver in Maui County since 1990 – numbers employed have tripled in that time span, and the cluster employs over 11% of the total workforce; only the Government sector (13%) and the visitor industry are larger employers. The largest single employer in Maui County is Maui Health with more than 1,600 staff at Maui Memorial Medical Center (MMMC), the MMMC outpatient clinic, Kula Hospital, and Lāna`i Community Hospital. Maui Health is also affiliated with Kaiser Permanente.

Over the period 2010 through 2021, the labor force in Maui County increased by 9% as a whole; the proportion for Healthcare and Social assistance was 49%, and the sector proved notably resilient during the pandemic, not least because employees were on the front lines providing treatment, care, and support. Two-thirds of the State job count data for the sector are employed in Healthcare occupations, with the remaining one-third in Social Assistance, which includes individual and family services, emergency and relief services, vocational rehabilitation services, and child day-care services.

Occupational wage data for healthcare, shown in the table below, demonstrate that a wide range of jobs are high-status and well-paid, validating the efforts to encourage the growth of the cluster. Many observers and professionals in the field voice the opinion that the Wellness sector is an obvious candidate for expansion, as informed by indigenous, cultural, and preventative health practices, together with alternative therapies. Although the concept of adding to visitor numbers may not be universally welcomed, any shift towards a more affluent market segment that can benefit Maui County's healthcare cluster and associated economic development is likely to also be positive for the resident population by upgrading services available and the caliber of the Maui-based professional corps.

As the healthcare occupational table shows, the Bureau of Labor Statistics differentiates between Practitioners and Technical Occupations (2,900 employees) earning an average of $109,310 and Healthcare Support Occupations (2,170 employees) earning an average of $39,910. This provides an illuminating insight into the bifurcation of compensation in the cluster.

Healthcare Occupational and Mean Wage Data, Maui County (2021)

Occupation	Numbers	Hourly	Annual
Physicians	160	$102.37	$212,930
Dentists	70	$79.99	$166,380
Pharmacists	100	$61.29	$127,470
Medical and Health Service Managers	120	$57.07	$118,710
Physician Assistants	30	$56.23	$116,960
Clinical and Counseling Psychologists	30	$51.82	$107,780
Registered Nurses	1,120	$51.73	$107,600
Dental Hygienists	140	$40.69	$84,630
Radiologic Technicians	70	$38.90	$80,910
Physical Therapists	100	$36.83	$76,600
Healthcare Social Workers	60	$36.02	$74,910
Massage Therapists	180	$32.32	$67,220
Mental Health and Substance Abuse Social Workers	60	$29.92	$62,240
All Occupations	**64,090**	**$26.91**	**$55,970**
Psychiatric Technicians	40	$25.42	$52,880
Licensed Practical Nurses and Lic. Vocational Nurses	140	$24.30	$50,540
All Other Healthcare Support Workers	370	$20.95	$43,570
Medical Assistants	280	$20.88	$43,430
Pharmacy Technicians	160	$19.63	$40,830
Dental Assistants	160	$19.33	$40,210
Community Health Workers	50	$16.71	$34,750
Nursing Assistants	350	$16.70	$34,740
Biological Technicians	140	$17.19	$35,760
Home Health and Personal Care Aides	690	$15.20	$31,620

Source: U.S. Bureau of Labor Statistics (BLS)

Healthcare and Wellness -- SWOT

Strengths[77]

Strong network of non-profit providers
UH Maui College programs and staff
Rich multicultural population demographic
Extremely alluring physical island environment
Passionate commitment to community
Plenty of new and innovative private health and wellness practitioners opening businesses post-pandemic
Community members familiar with each other
Three different islands in the County offering three different lifestyles
Awesome kūpuna programs
Strong grassroots movements with ability to access County support
Manageable number of key participants in healthcare proving the ability to build for the future – as opposed to trying to protect the status quo

Weaknesses

Wages not matching the cost of living or the importance of the healthcare role
Aging demographics and shrinking workforce
Lack of affordable housing
Mismatch between cost of workforce (up) and healthcare reimbursements (down)
Limited funds to grow programs
Lack of qualified individuals to work in healthcare field
Delivery system built on obsolete models of care
Loss of great practitioners due to lack of housing or feeling of disconnectedness with community
Inadequate infrastructure
Many residents cannot afford alternative healthcare
Lack of community programs to support alternative healthcare
Overwhelmed systems do not allow residents to learn about them and be supported in prevention
Income disparities
Growing Medicaid population
Insurance is driving the healthcare system, not the community

Opportunities

UHMC to start a program for Licensed Practical Nurses (LPN) and B.S. in Nursing (BSN)
Focus/emphasis on food and energy sustainability
Improved bandwidth to make telehealth available in all areas of the County
Identification of, and funding for, apprentice programs and educational opportunities

[77] Numbers in parentheses represent the number of votes by Focus Group members concurring with the statement

Prioritize affordable housing for healthcare personnel
Medical vacations (medical tourism)
Build out MDVIP[78] private pay service model to support all of the community
Strengthen and build more career pathways with the Department of Education and UHMC to create needed workforce
Increase demand for high-quality healthcare services expected by recent residents
Incentivize growing trend for healthcare cash payments

Threats
Residents seeking healthcare off-island
Worsening acceleration of housing, cost of living, and healthcare costs
Lack of understanding of healthcare complexities
Increased demand of high-quality healthcare by new arrivals
Investment needed in "cross chasm" of change

[78] Name of a Florida-based private company operating a network of physicians offering preventive and primary care

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Science, Technology, Innovation and Efficiency

Priorities and Strategies

Priorities[79]

- **Create incubator and accelerator facility and programs for Maui County businesses**
- **Develop new degree courses and industry-recognized certifications to provide pathways for higher-paying STEM jobs**
- **Develop online tools to make finding local tech talent easier**
- **Establish a mechanism for tech companies to collaborate, team together on contracts and shared projects, and share personnel as required**
- **Feasibility study for Maui County as a launch site for space activities**
- **Highlight Hawaiian culture as leading epistemology in Maui Nui to protect home-grown intellectual property rights and encourage Native Hawaiian entrepreneurship**
- **Streamline basic start-up, permitting process and access to capital for targeted businesses**

- Develop Web3, Blockchain, DAO (Decentralized Autonomous Organization) technology
- MRTC improvements: keep A/C on 24/7, fix plumbing and plumbing fixtures, roof, etc.
- App development
- Promote restoration of loʻi kalo and loko iʻa
- Create more workforce housing, including for science and tech workers

Other (1 each): Healthcare equipment manufacturing;

Strategies

- Develop "Maui" Brand (separate from "Hawaiʻi") and market Maui as a world center
- Work with State Legislature to restore the Maui Research and Technology Park to its original vision as a vibrant incubation location conducive to innovation companies
- Promote Hawaiian wayfinding education and space sciences
- Emphasize high-value, high-growth industries to get in front of the curve; define what and where Maui wants to be
- Increase collaboration between Maui tech companies
- Educate Mayor's Office and Council: 1 tech job creates 6 non-tech jobs
- Improve the effectiveness of Maui County Departments

[79] Priorities in boldface are those with the most consensus by Members of the Focus Group

- Develop a two-way virtual workforce

Other (1 each): Create centers of excellence; Create shared space observation resources to promote space sciences

Science, Technology, Innovation and Efficiency

Cluster Analysis

When the science and technology cluster was at a fledgling stage in Maui County in the 1980s, further development was a viable and attractive option because it was a clean, environmentally friendly option and was largely free of the encumbrances of expensive shipping and geographical distance. Despite its isolated location, Maui enjoys several competitive advantages in attracting science, technology, and innovation enterprises, such as its time zone that bridges the Continental U.S. and Asian technology markets; its desirable environment and quality of life; and incentive programs past and present, such as SBA HubZone[80] and Foreign Trade Zone. The cluster was also favored as it provides skill-based, competitively paid jobs for which a STEM pipeline could be provided for residents with STEM education opportunities in County K-12 schools and post-secondary education. Community and business leaders recognized the potential for giving employers the advantage of avoiding relocating and transplanting staff. Since then, the science and technology cluster has expanded as a strategic component of Maui County's economic base, with some oscillations over time in part due to Federal policy and funding decisions.

In terms of future development and growth within this cluster, a very promising sign is the foundational and permanent presence of U.S. Space Force (USSF) activities on Maui. National security requires the ability to operate and maintain satellites in a congested and contested space environment. In May 2022, the USFF Delta 2 activated the 15th Space Surveillance Squadron in the Maui Research & Technology Park in Kihei, in partnership with the Air Force Research Laboratory and the Maui Supercomputing Center. The Squadron's focus is to execute a critical mix of research, development, and operations based on Maui. This recent milestone provides Maui County an opportunity for critical national presence and "pull" for space technology along with products, services and workforce expertise needed to meet the USSF's objectives. Along with the Space Force itself, defense contractors are establishing a presence or planning to do so, and for the first time, a significant number of commercial companies and investors.

Maui County's Science, Technology and Innovation cluster lacks sufficiently disaggregated published occupational and wage data, for example, and for some statistics a degree of overlap exists between the cluster and Healthcare, Energy (especially Renewable Energy), and Agriculture. Nevertheless, growth in this sector, as measured by numbers employed in the cluster, has been marked since the early 1980s, rising from an estimated 175 jobs or so in the early 1980s to more than 2,000, representing 3.2% of all those employed in 2021. Many have

[80] The Small Business Administration HUBZone designation (Historically Underutilized Business Zone)

attributed these numbers to the efforts of Senator Daniel K. Inouye as well as MEDB programmatic support.

Numbers employed in the cluster then stabilized through the beginning of the downturn in 2008, then declined by more than 10% through 2011. Some of this retrenchment was due to the closure of Federal programs, corporate mergers and relocation, as well as an increase in out-of-state remote working. By 2015, with total employment numbers increasing, Science, Technology and Innovation jobs represented 2.8% of the total. They have since returned to the 3.2% to 3.3% of the labor force range and the sector showed notable resilience during the COVID-19 pandemic. Indeed, anecdotal evidence from professionals in the cluster indicates that recent job growth has occurred, even if these were not specifically captured in official counts.

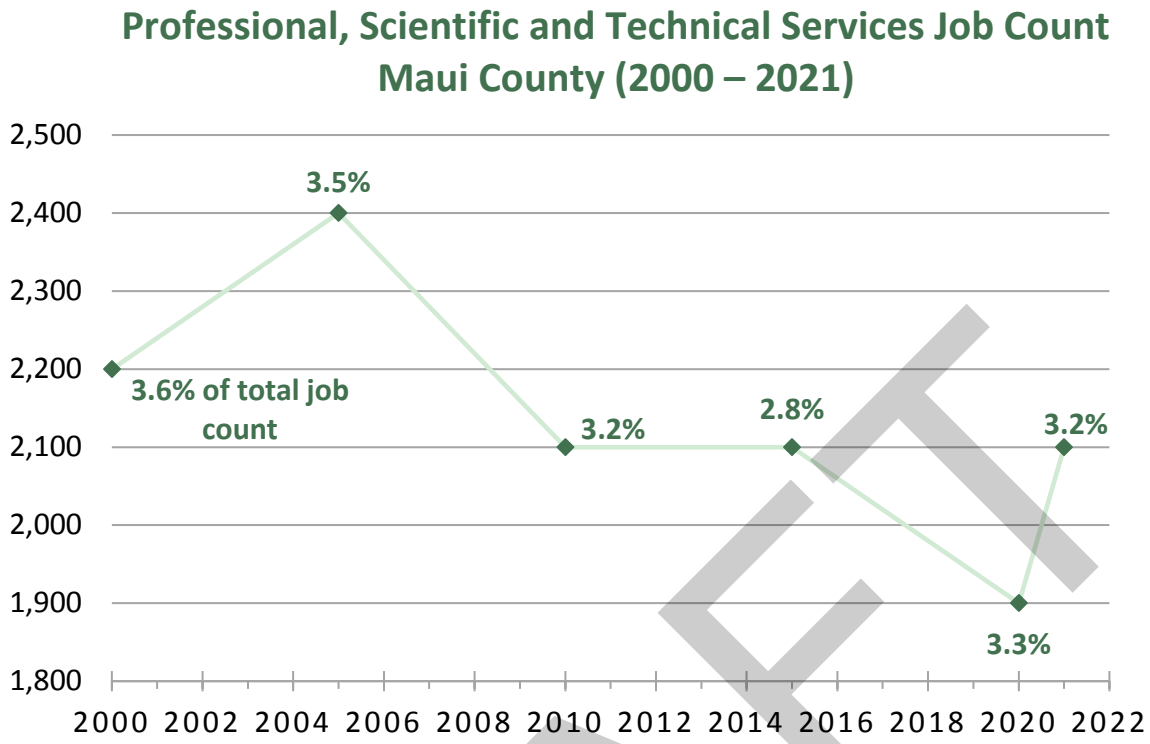
Professional, Scientific and Technical Services Job Count Maui County (2000 – 2021)

Year	Job count
2000	2,200
2005	2,400
2010	2,100
2015	2,100
2020	1,900
2021	2,100

Source: DLIR, Annual averages
Note 1: Includes Information; excludes Company Management and Administration, and Federal Employees (DoD etc.)
Note 2: An earlier study (HiSciTech: An Economic Workforce Profile) estimated additional employment in supplier companies or non-tech service providers of at least 1,500 jobs

The official numbers collected by the State Department of Labor exclude Federal employees, especially those in the military, which includes Air Force Research Laboratory (AFRL) and related personnel stationed in Maui County, many of whom are engaged in science and technology work [81]. It is also worth noting that the combination of a number of jobs in the Science, Technology, Innovation and Efficiency cluster included in the official job count of other industries, excludes in the Information field, company management and administration, suggesting a significant undercount. In any event, Maui has the largest number of private sector technology-related jobs in the State, after O‘ahu.

[81] Other DLIR data estimate a total of 900 Federal employees (number rounded) in Maui County in 2021 and so far in 2022.



Source: DLIR, Annual averages
Note 1: Includes Information; excludes Company Management and Administration, and Federal Employees (DoD etc.)
Note 2: An earlier study (HiSciTech: An Economic Workforce Profile) estimated additional employment in supplier companies or non-tech service providers of at least 1,500 jobs

In terms of labor force structure, perhaps most notable is that, based on a 2000 survey, less than 1% of the science and technology labor force was drawn from Hawai'i high school graduates; today, approximately 60% are home-grown. The numbers of women in the cluster have also significantly increased, with several now in leadership roles, for example in space contractor research roles and at the R&T Park Vanguard Center and leading research positions in private technology companies.

The Science, Technology, Innovation and Efficiency cluster has consistently shown mean earnings that are well above the average for all occupations, a major reason that MEDB, County, Federal and private funding has supported a robust STEM education-to-workforce pipeline in Maui County schools that includes gender and culturally aligned curricula, project-based learning, job shadowing, internships, mentoring, and professional development for Maui County's educators. Nurturing home-grown talent provides an incentive for businesses in the cluster to operate and remain in Maui County, and for others to relocate.

Occupational and Wage Data, Maui County (May 2021)

Type of Jobs	Mean Hourly	Mean Annual
Maui County – All Occupations	$26.91	$55,970
Selected Science & Technology Occupations		
Engineering & Architectural Managers	$65.20	$135,610
Software Developers	$61.56	$128,050
Electrical Engineers	$59.72	$124,220
Computer & Information System Managers	$59.59	$123,950
Computer Systems Analysts	$47.62	$99,050
Network & Computer System Administrator	$41.79	$86,920
Web Developers	$34.63	$72,030
Computer Network Support	$32.32	$67,220
Life & Physical Science Occupations	$31.84	$66,220
Computer User Support	$28.98	$60,290
For Comparison		
Healthcare Practitioners & Technical	*$52.55*	*$109,310*
Lawyer	*$45.49*	*$94,620*

Source: DLIR

Maui County's most significant market segments within the Science, Technology and Innovation cluster are Information and Communications Technology, Defense/Aerospace, Engineering/Professional Services, Renewable Energy, Agricultural Biotechnology, and Astronomy and Optics.

Science, Technology, Innovation and Efficiency -- SWOT

Strengths

Work/Life balance, environment and quality of life
Inherent sense of aloha in the community that supports education
Air Force/Space Force presence
Privateer.com presence
Maui R&T Park community and ownership commitment to innovation
Large plots of land for Ag
Attraction of Maui facilitates inviting external tech experts to share knowledge with local tech companies
Education systems to teach, train and certify apprentice workforce
Strong workforce STEM foundation
Natural location for renewable energy activity
Multiple cultures and languages make a natural communication bridge to Asia
Beautiful/desirable environment

Other (1 each): Location -- closer to Asia and Australia than Continental U.S.; Haleakalā – one of top 5 sites in the world for observing space; Solar telescope (DKIST) presence; Pacific Disaster Center presence; Companies' interaction with students providing inspiration; Internship opportunities; County's recognition of Hawai'i's unique standing (U.S./State/ Kingdom)

Weaknesses

Lack of workforce housing/Housing for low- and middle-income families/Lack of temporary housing (<6 months) for engineers, traveling nurses, etc.
Aversion to change, growth, or new technologies
Lack of investor incentives
Lack of major funding to achieve goals/Lack of local investor institutions (banks or venture capital)/Lack of Tier 1 institutional investors or private equity
Lack of Big Picture leadership to diversify the economy
Lack of employees with skills needed/Difficulty finding reliable, consistent workforce
Lack of small business incubation and acceleration
Corporate status: Need to be a Hawaii Corp for State incentives but Delaware Corp. for Venture Capital funding. Difficult for smaller businesses to achieve Subsidiary structure/status
Lack of STEM degree availability on-island, leading to brain drain
Lack of affordable and secure workspace
Poor communications infrastructure

MRTC not fully functional as an innovation incubator
High taxes for small businesses

Other (1 each): Lack of drone pilots; Location (sea-locked); Lack of mid-level engineers and developers for company-building; high cost of living deters talent; Lack of modular housing factory to reduce cost of affordable housing; lack of program to actively connect HS and college graduates into innovation positions; Length of process for business to set up, get permits, build or renovate; Lack of ownership/accountability to implement recognized strategy

Opportunities

Create accelerator/incubation programs for needed tech
Attract the great talent that want to be here
Promote Maui County as a leader in Space Tech
Research funding
Growth in aerospace funding opportunities in Maui
Expand UHMC degree programs
Keep Maui's educated here by providing better/more diverse job opportunities
Sen. Schatz position on Appropriations and other Senate Committees
Create a Maui County tech-focused jobs board
Create jobs that don't consume natural resources(
Capitalize on Destin Cretton's success in underscoring Maui's Creative Industries capabilities
Growing drone operations for Ag mapping

Other (1 each): Improved methods of recycling E-waste locally; Drone certification degree at UHMC; Outdoor tech activities; aging population; Sensor technology (esp. Ag sensors); Cybersecurity Center of Excellence

Threats

Increasing cost of living and cost of housing
Taxation and O'ahu taking tax revenue
Outmigration of youth due to wages and cost of living/Lack of well-paying careers for youth and graduates
Reputation/reality that County is business-unfriendly
Climate change and sea-level rise
Supply chain issues/breakdown
Plantation mindset
Nepotism

Displacement due to settler colonialism
Housing shortage due to County building permit delays
Cost of doing business on Maui
Drought/Aversion to, and fear, of spending on pono water policies
Lack of STEM educational opportunities in many high-demand fields
Lack of good university system for tech talent
Distrust of government
Jones Act causing lack of direct importation
Lack of consistent strategy, commitment and funding to innovate
Insufficient funding for employees, housing, medical, etc.
Division between Mayor's Office and Council
Reversion to tourist-based economy post-COVID (esp. by State)

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Visitor Industry

Cluster Analysis

Given the ongoing community convening for the Maui Nui Destination Management Action Plan 2021-2023 (Maui Nui DMAP) conducted by the Hawai'i Tourism Authority (HTA), it was considered more productive to use this, and a second HTA document, their Strategic Plan 2020-2025, that look strategically at the visitor industry cluster over the next few years.

In 2021, The Hawai'i Tourism Authority (HTA) published the Maui Nui Destination Management Action Plan 2021-2023 (Maui Nui DMAP) in response to the record numbers of visitors statewide in 2019, which put pressure on many communities, impacting residents' quality of life as well as the visitor experience as well. The aim of the DMAP process is "to rebuild, redefine, and reset the direction of tourism over a three-year period. The focus is on stabilization, recovery, and rebuilding of the desired visitor industry for each island." Maui County's DMAP specified 6 objectives to achieve the goals:

- Create positive contributions to the quality of life for Maui County residents
- Support the maintenance, enhancement, and protection of Maui County's natural resources
- Ensure the authentic Hawaiian culture is perpetuated and accurately presented in experiences for residents and visitors, materials and marketing efforts
- Maintain and improve visitor satisfaction of their experience in Maui County
- Strengthen the economic contribution of Maui County's visitor industry
- Increase communication and understanding between the residents and the visitor industry.

HTA's Strategic Plan 2020-2025 acknowledged that "tourism is at a point that requires a re-balancing of priorities. The continuous drive to increase visitor numbers has taken its toll on our natural environment and people, the very reason visitors travel to our islands." The Plan therefore focused on Destination Management, which includes attracting and educating responsible visitors; advocating for solutions for overcrowded attractions, overtaxed infrastructure, and other tourism-related problems; and working with other responsible agencies to improve natural and cultural assets valued both by residents and visitors.

HTA's Strategic Plan 2020-2025 was organized around four interacting "pillars":

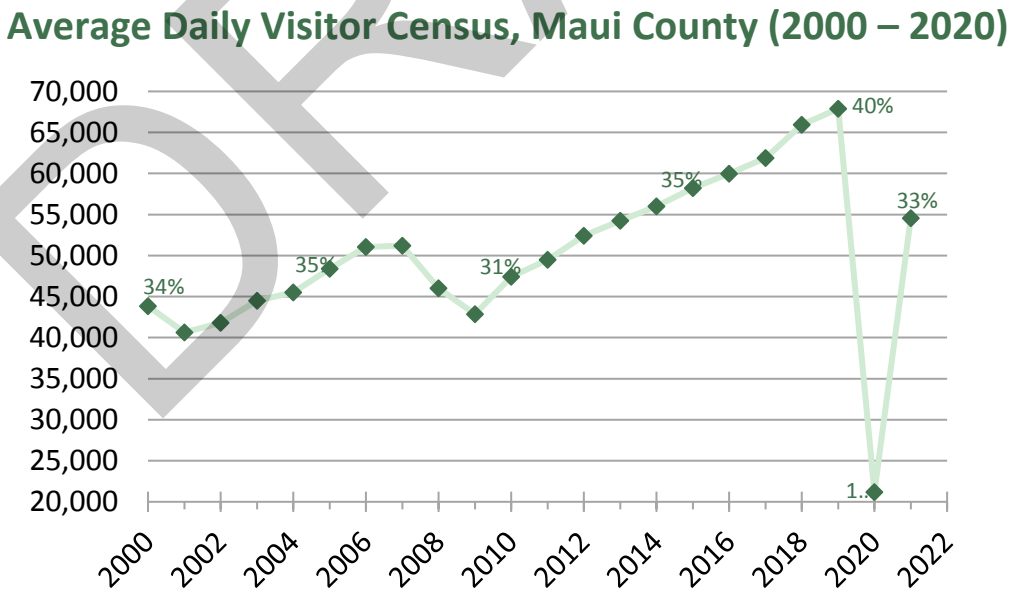
- Natural Resources (respecting Hawai'i's natural and cultural resources)
- Hawaiian Culture (supporting Native Hawaiian culture and community)
- Community (ensuring that tourism and communities enrich each other)

- Brand Marketing (strengthening tourism's contributions)

Regarding visitor industry data, the number of visitors to Maui County is a key metric for a number of reasons. Since an estimated two-thirds of the County's economy is related, directly or indirectly, to the visitor industry, overall jobs and income are strongly correlated to this sector. In 2019, HTA estimates that Maui County visitors contributed $5.13 billion in expenditures, averaging a stay of 8 days and spending $212 per person per day. Hotel occupancy was 78% with an average daily hotel room rate of $400. A high proportion of visitors were repeat (71%), independent travelers (81%), and took self-guided tours or drove around the island (83%). HTA reported that only 21% visit historic sites and 19% visit museums or art galleries[82]. Latest (July 2022) data show an average daily room rate of $600 and an occupancy rate of 70%.

# # #

The resident population of Maui is consistently augmented by a significant number of visitors. In 2000, the average daily visitor count for Maui County was 43,854 (or 34% of the resident population)[83]. In peak months (December, January, February), this number is typically at least 10,000 higher. By 2015, the average numbers of visitors in Maui County on any given day reached 58,211 (35%) and in 2019, a record year pre-pandemic for visitor numbers, an average of 67,885 (40%). Visitor numbers peaked in July 2021, with as many as 76,000 visitors were in Maui County at on any day (46%).

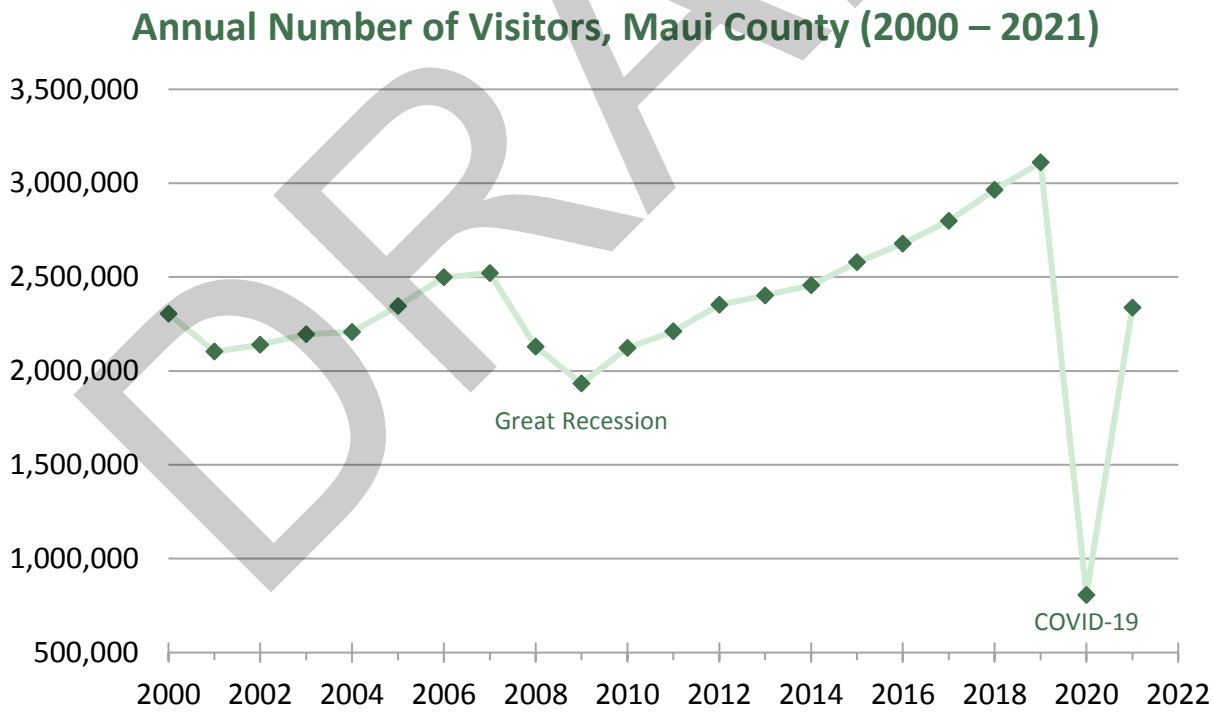


Source: Hawai'i Tourism Authority, Annual Visitor Research Report, and DBEDT

[82] Hawai'i Tourism Authority, Maui Nui Destination Management Action Plan 2021-2023
[83] DBEDT, Annual Visitor Research Reports.

The metrics contained in the Maui Island Plan of 2012[84] that call for an optimal ratio of visitors to residents of 3 to 1, and percentages included in the chart above reflect the actual proportions. The significance of the ratio of the visitor count to resident population is the feeling expressed by residents of overcrowding on the roads, in the stores, and on beaches, the degradation of natural resources, and the strain on the capacity of medical services. This upsurge of opinion has led to the subsequent community call for more responsibly managed tourism.

Following the "Great Recession" of 2008-09, the total annual number of visitors dipped below 2 million, rising strongly and consistently (by 50%) through 2019, exceeding 3 million for the first time. With the outbreak of COVID-19 and the lockdown beginning statewide in March 2020, visitor number collapsed for several months, devasting the County's economy, which saw a national record-high unemployment rate of 34% in April 2020. Visitor numbers rebounded during 2021 and early 2022 has again seen record-setting numbers, due in part to pent-up travel demand because of the pandemic lockdown, stored disposable income for many during the pandemic, and an inability for a while to travel international routes.

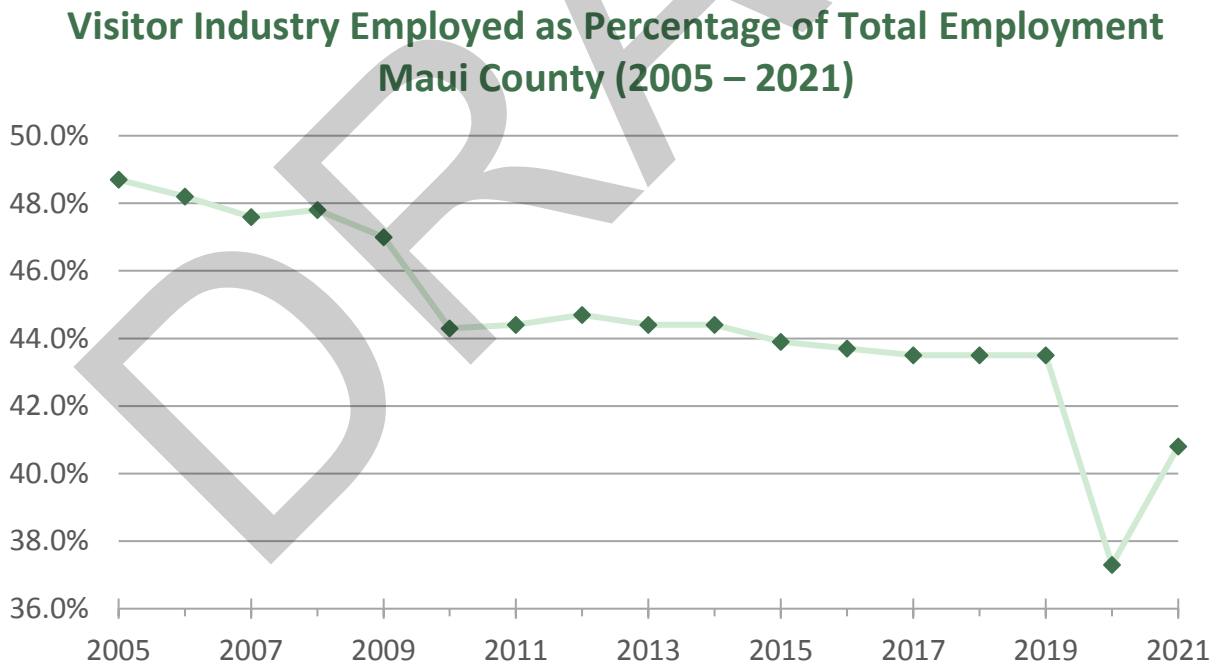


Source: Hawai'i Tourism Authority, Annual Visitor Research Report, and DBEDT

[84] https://www.mauicounty.gov/1503/Maui-Island-Plan

As the Maui County General Plan 2030 (currently being updated) states, from the beginning of Maui's visitor boom in the 1960s, "it has been County policy to maximize the economic benefits of the visitor industry by attracting higher-spending visitors rather than maximizing the number of visitors to the island." The visitor industry serves as the main driving force of Maui County's economic engine, and Maui County's economy is more reliant on the cluster than other Hawai'i counties. It is therefore important to take steps to manage the industry responsibly and sustainably while developing other clusters and diversifying to increase resilience. The industry is highly dependent on the health of the global economy as demonstrated in recent times by the economic impact of the events of 9/11, the "Great Recession" of 2008-09, and most notably, the COVID-19 pandemic. Measures of the importance of the visitor industry to Maui County include the 40% of real property tax collections that it contributes and the 40% of direct employment (a percentage that has gradually declined since 2001) for which it accounts and an estimated further 25 to 30% in jobs supported indirectly by tourism. For example, considerable employment is generated in agriculture, health services, construction and real estate, entertainment and recreation.

Since 2005, the long-term trend in visitor industry employment as a percentage of total employment is downwards.



Source: DLIR

The components of visitor industry employment over the last decade are as follows:

Numbers Employed in the Visitor Industry, Maui County (2005 – 2021)

Year	Accommodation	Food Service	Retail and Wholesale	As % of Total Employment
2005	11,900	8,000	10,800	48.7%
2006	12,000	8,400	11,000	48.2%
2007	11,800	8,400	11,500	47.6%
2008	11,900	8,200	11,400	47.8%
2009	10,900	7,400	10,400	47.0%
2010	10,700	7,700	10,300	44.3%
2011	11,100	8,200	10,300	44.4%
2012	11,700	8,700	10,400	44.7%
2013	12,000	9,000	10,600	44.4%
2014	12,200	9,300	10,900	44.4%
2015	12,000	9,600	11,400	43.9%
2016	12,300	9,900	11,400	43.7%
2017	12,600	10,200	11,500	43.5%
2018	12,800	10,500	11,600	43.5%
2019	13,000	10,500	11,500	43.5%
2020	7,100	5,900	9,800	37.3%
2021	9,900	8,000	10,300	40.8%

Source: DLIR

Interestingly, the trend in the core Visitor industry employment over the period, as a share of total employment, has been consistently downward, suggesting that some diversification away from the cluster has been occurring, in part also supported by the evidence of growing shares of total employment for clusters such as Health and Wellness and Construction.

Visitor number trends and implications for the economy of Lānaʻi and Molokai are presented in the sections for those islands.

As dominant a cluster as the Visitor industry is in Maui County's economy in terms of employment and revenue, wage data shows that the cluster's service jobs are remunerated at levels typically below the mean for all earners.

Visitor Industry Occupational and Mean Wage Data
Maui County (2021)

Occupation	Numbers	Hourly	Annual
Lodging Managers	40	$58.21	$121,090
Facilities Managers	90	$49.97	$103,930
Administrative Service Managers	150	$47.19	$98,160
Food Service Managers	120	$42.19	$87,750
Chefs/Head Cooks	200	$38.19	$79,430
Meeting, Convention and Event Planners	90	$29.39	$61,120
All Occupations	**64,090**	**$26.91**	**$55,970**
1st Line Supervisors of Housekeeping and Janitorial	150	$25.97	$54,010
1st Line Supervisors of Food Prep and Svc. Workers	350	$25.26	$52,950
Hotel, Motel, and Resort Desk Clerks	500	$25.07	$52,150
1st Line Supervisors of Retail Salespersons	730	$24.72	$51,420
Bartenders	490	$24.12	$50,180
Maids, Housekeepers, Cleaners	1,670	$21.84	$45,430
Cooks (Restaurants)	1,500	$21.11	$43,900
Wait Staff	1,780	$19.40	$40,350
Tour and Travel Guides	70	$18.28	$38,020
Restaurant and Lounge Hosts/Hostesses	360	$18.06	$37,560
Shuttle Drivers and Chauffeurs	270	$18.04	$37,510
Food Preparation Workers	540	$17.94	$37,310
Retail Salespersons	2,540	$17.48	$36,350
Janitors and Other Cleaners	1,430	$16.77	$34,870
Dishwashers	520	$16.46	$34,240
Baggage Porters and Bellhops	240	$16.28	$33,870
Cashiers	1,960	$15.88	$33,020

Source: U.S. Bureau of Labor Statistics (BLS)

Numbers involved in the higher-paying occupations in the sector are relatively small, whereas some of the largest occupations in Maui County's visitor industry have incomes significantly below the mean wage overall. For example, retail salespersons represent about 3.8% of the workforce and earn only 65% of the mean wage for all those employed; cashiers make up 3.1% of the workforce and earn 59% of the mean. It should be noted that many of the occupations in the cluster likely earn income in tips, but the overall pattern is well-established.

Hāna

Priorities and Strategies

Priorities[85]

- **Increase local business collaboration, development and networking to create a tight-knit Hāna network**
- **Create plan for Civic Center in Hāna to include business space and parking**
- **Regulate tourism and shift focus to cultural tourism to promote quality of visitors and mindful visitor management ("quality over quantity")**
- **Strengthen food security**
- **Create and execute a highway safety and stabilization plan**

Strategies

- Increase education opportunities
- Improve food distribution and exporting
- Promote Hāna
- Maui.com as the East Maui web portal
- Connect Hāna youth to UH trade program opportunities

Other (1 each): Improve speed and reliability on internet connectivity/ Develop curricula of specific relevance for interests of Hāna youth/Improve infrastructure to enable building of new business

[85] Priorities in boldface are those with the most consensus by Members of the Focus Group

Hāna

Cluster Analysis

Hāna is a rural and geographically isolated community at the eastern end of Maui island, reached mainly by the winding and scenic 52-mile-long Hāna Highway that stretches along Maui's north shore; the road was completed in 1926. The economy of the community is driven largely by agriculture and the visitor industry (mainly day-visitors) and due to its relatively small size and distance from other communities, Hāna is distinguished by unique characteristics and challenges. In common with other rural communities such as Lāna'i and Molokai, Hāna has a significant subsistence economy that is both unmeasured and unofficial and an informal trade and barter network.

The Hāna Census Tract (301), including communities from Keanae to the northwest and Kahikinui to the southwest, recorded a population of 2,719 in the decennial census of 2020, an increase of 19% over 2010, 46% over 2000, and almost a doubling -- 91% -- compared to 1980. For many, the remoteness, rural lifestyle that Hāna offers and the Native Hawaiian culture and traditions that prevail in the region have attracted new residents over recent decades, more than compensating for the outmigration of younger residents seeking education and employment opportunities.

Hāna District Population (1980 – 2020)

Year	1980	1990	2000	2010	2020
Population	1,423	1,895	1,855	2,291	2,719

Source: U.S. Census Bureau, 2020 Census, Table P1, Census Tract 301

It should be noted that Census Bureau 2020 American Community Survey (ACS) data estimate the Hāna population as 1,388, a difference almost half compared to 2020 Census data. Responding to an inquiry to explain the significant difference, the DBEDT population statistics office advised that ACS data should be regarded with caution because of data collection issues during the COVID-19 pandemic. Census results include mitigation of a non-response bias, so that the two sources of data from the U.S. Census Bureau might best be interpreted as providing a range of population in 2020, from 1,388 to 2,719. DBEDT noted by email that in their opinion, "The Census 2020 population numbers would be the more accurate count."

In terms of ethnicity, the 2020 Census reported that the largest percentage of the Hāna tract's population self-identified as Native Hawaiian and Pacific Islander (39%). The next largest group were those self-reporting as White (31%). The following table shows the detailed breakdown by ethnicity, together with a comparison with Maui County as a whole.

Hāna District Population by Ethnicity Compared with Maui County (2020)

	Number	Hāna District (%)	Maui County (%)
Native Hawaiian & Pacific Islander	1,058	39%	11%
White (Caucasian)	844	31%	35%
Two or More Races	425	26%	24%
Asian	85	3%	29%
African American/Alaska Native/Other	28	1%	1%
Total	**2,719**	**100%**	**100%**

Source: U.S. Census Bureau, 2020 Census, Table P1, Census Tract 301

The most obvious difference in ethnicity in the Hāna population compared to Maui County as a whole, in addition to the preponderance of the Native Hawaiian population, is the far smaller number self-reporting with Asian heritage; In Maui County as a whole, the largest ethnic groups include those identifying as Japanese, Filipino, Chinese, and Korean. The principal explanation was the lack of large plantation-based agriculture in Hāna and the associated historic in-migration of Asian field workers and trades people. Of the 26% in the Hāna District that identify as two or more races, 36% report three or more races, and 4% four or more.

Median Age of Hāna, Maui County and Statewide Residents (2020)

	Male	Female	All
Hāna	50.1 years	52.4 years	50.6 years
Maui County	41.0 years	42.8 years	41.8 years
Hawaii State	37.9 years	41.0 years	39.4 years

Source: U.S. Census Bureau, Census Tract 301

Population age is significant for planning and provision of services. As Census data show, the median age of Hāna residents is over 9 years more than for Maui County as a whole, and over 12 years more than the rest of the State.

Disaggregated labor force and occupational data for the Hāna region is not available. The COVID-19 pandemic brought the Hāna economy to a standstill as for three months, access roads – Hāna Highway and Pi`ilani Highway – were blockaded to prevent the spread of the virus and only residents could pass through. One instructive local initiative was documented in a recent article in the monthly publication MauiTimes[86]. The author noted, “Once the agricultural heart of the island, East Maui has grown dependent on the same food supply tropes that the county residents know too well,” with the regular runs from Hāna to Costco, Foodland and other supermarkets in Central Maui. “For some, hunting boar and pounding paʻiʻai is still

[86] “The Mana of the Market,” Viola Gaskell, MauiTimes, January 2022.

integral to the East Maui way of life, but for many, food has been commodified and is increasingly imported." However, just before the pandemic lockdown, a farmers market opened in Hāna, which according to the manager, has since become a primary source of income for more than half of the 20 regular vendors. Pandemic relief funds were used to issue residents with scrip to spend at the farmer's market. From July 2020 to October 2021, an estimated $300,000 was recycled into the Hāna economy with nutritional as well as monetary benefit for vendors. The initiative also gave a boost to the local farming community – a true win-win situation.

American Community Survey data from the Census Bureau provides annual information on Per Capita Income. In 2020, average income in the Hāna region was $28,642, compared with $36,872 for Maui County as a whole, and $37,013 for the State.

Hāna -- SWOT

Strengths
Hawaiian culture
Tight-knit community and community pride
Open space preservation
Natural beauty
Pūnana Leo and Kula Kaiapuni
Diversified population
Access to fishing and hunting
Cultural center
Low crime rate
Hāna Farmers Market weekly
Clean (fresh) water
Clean ocean
Strong family support units
Ag industry

Other (1 each): Local radio station; Anticipated homestead development; Niche markets; Families with genealogical ties to the land; Strong community engagement and county council representation

Weaknesses
Lack of affordable housing and housing for local population
Traffic
Lack a community kitchen and food processing facility
Lack of accurate visitor statistics
Limited education opportunities
Lack of performance venue
Lack of disaster preparedness
Lack of services (e.g. appliance repair, auto mechanic)
Lack of elderly support services
Lack of community playground for keiki

Other (1 each): Limited parking for civic center and County park; Isolated geographic location; Limited grocery store options; Substandard road quality; Drug and alcohol abuse; Lack of support for Native Hawaiian cultural preservation; Limited office and business space; Unusable community center; Lack of capital and investment; Lack of cultural workforce development programs

Opportunities
Improvement of recreational spaces (e.g. Hāna Bay, performance venue for local talent)
Trade school programs/funding for secondary and trade schools
Alternative energy resources
Improving financial literacy
Improving digital literacy
Curated visitor experiences and online bookings
Economic diversification to create more resident job opportunities
Develop creative industries sector
Locally owned business ventures
Use ranch land for housing
Small ʼohana gardens and aquaculture programs
Natural resource preservation
Internships
Business scholarship programs
Community stewardship

Other (1): Funding opportunities for Native Hawaiians

Threats
Lack of, and limited, infrastructure
Land sales
Miconia and invasive species
Impacts of global warming, sea level rise and natural disasters (tsunamis, floods, etc.)
Degradation of natural resources
Lack of housing
Youth bored/turned off due to lack of youth-oriented activities
Drugs and alcohol abuse
Unbalanced development
Over-tourism/uneducated or ignorant tourists
Underfunding of Hāna School
Government regulations for building and water permits
Lack of land for business development
Lack of first responders (numbers limited)
Geographical isolation
Insufficient pay scales

Other (1 each): Lack of job opportunities; Loss of Native Hawaiian population; Property bought by non-Hawaiians; Hāna Highway

Lāna'i

Priorities and Strategies

Priorities[87]

- **Construct affordable housing on County-owned land**
- **Establish long-term care and retrofit homes to enable kūpuna to remain on-island**
- **Pilot a new visitor model for County: Welcome visitors while educating them about respect for the land and resources**
- **Support food security by supporting a Farmers Market and showcasing Lāna'i High and Elementary School (LHES) produce**
- **Plan creation of 100-acre Agriculture Park**

- Increase healthcare access via telemedicine (or medical professionals' visits)
- Protect the watershed
- Create a Lāna'i Non-Profit hub to encourage collaboration and support
- Plan/conduct a charette to determine best business/economic model for the island

Other (1 each): Plan industrial park; Plan airport expansion; Assist a non-profit Preschool to secure a bigger facility to serve more families

Strategies

- Increase young Lāna'ians (25 to 45) civic participation to create new leadership
- Develop and support well-paid career tracks at LHES that encourage youth to stay on-island
- Assess visitor capacity (infrastructure and natural resources) and plan accordingly
- Community and Pūlama Lāna'i to collaborate in finding community solutions and benefits
- Increase opportunities for diversified agriculture
- Improve quality of keiki education
- Increase "lift" to bring in necessities

Other (1 each): Approve/implement land access to revitalize community use; Financial literacy education for youth and adults

[87] Priorities in boldface are those with the most consensus by Members of the Focus Group

Lāna'i

Cluster Analysis

Lāna'i is the 6th largest island in the State and since 2012, is 98%-owned by Larry Ellison, founder and CEO of Oracle Corporation and founder of Pūlama Lāna'i, the island's land and resource management company. The remaining 2% of the island is owned by the State, Maui County, and by private landowners. Lāna'i is known as "The Pineapple Island" because of its history as an island-wide pineapple plantation since the 1920s, when James Dole, President of the Hawaiian Pineapple Company (later the Dole Food Company), purchased the island and developed 18,000 acres of the Palawai Basin in the central flatlands as the world's largest pineapple farm. In the 1960s, Dole merged with Castle & Cooke, one of Hawaii's "Big 5" companies, and in 1985, Castle & Cooke was in turn merged with David Murdock's Flexi Van Corporation and thus passed into his sole ownership. As the pineapple operation was being phased out in the 1980s (closing permanently in 1992), the island's resorts began to be developed. Murdock sold his interests in, and control of, Lāna'i to Larry Ellison for a reported $300 million.

Currently, Pūlama Lāna'i, which describes itself as a cultural steward and community builder, is developing and managing sustainable solutions including conservation programs, freshwater supply, and hydroponic agriculture. Larry Ellison has stated that his goal is to have the island be "the first economically viable, 100% green community." He pledged to invest $500 million in infrastructure projects, including renewable energy and an environmentally friendly agriculture industry. Pūlama Lāna'i's website states, "We strive to enhance and perpetuate the island's diverse species and fragile ecosystem through game management, natural species preservation, watershed management, erosion control, coastal resources and fisheries management, invasive species control and conservation education." Since the transition in ownership, several renovation projects have been completed, including a state-of-the-art community theater, Hospice House, pharmacy, physical therapy service, community pool, housing, and landscaping.

In June 2015, both major resorts were closed for renovation. The Four Seasons Resort Lāna'i at Manele Bay, originally opened in 1991, reopened in February 2016 as a premium, 5-diamond destination. The former Four Seasons Lāna'i The Lodge at Kō'ele, originally opened in 1990, temporarily accommodated construction personnel working on the Manele Bay Resort and reopened as Sensei Lāna'i , A Four Seasons Resort and wellness destination. Other facilities on the island include a single K-12 school, Lāna'i High and Elementary School, a 24-bed Community Hospital, and the Lāna'i Community Health Center that offers primary care, dental, and other healthcare services.

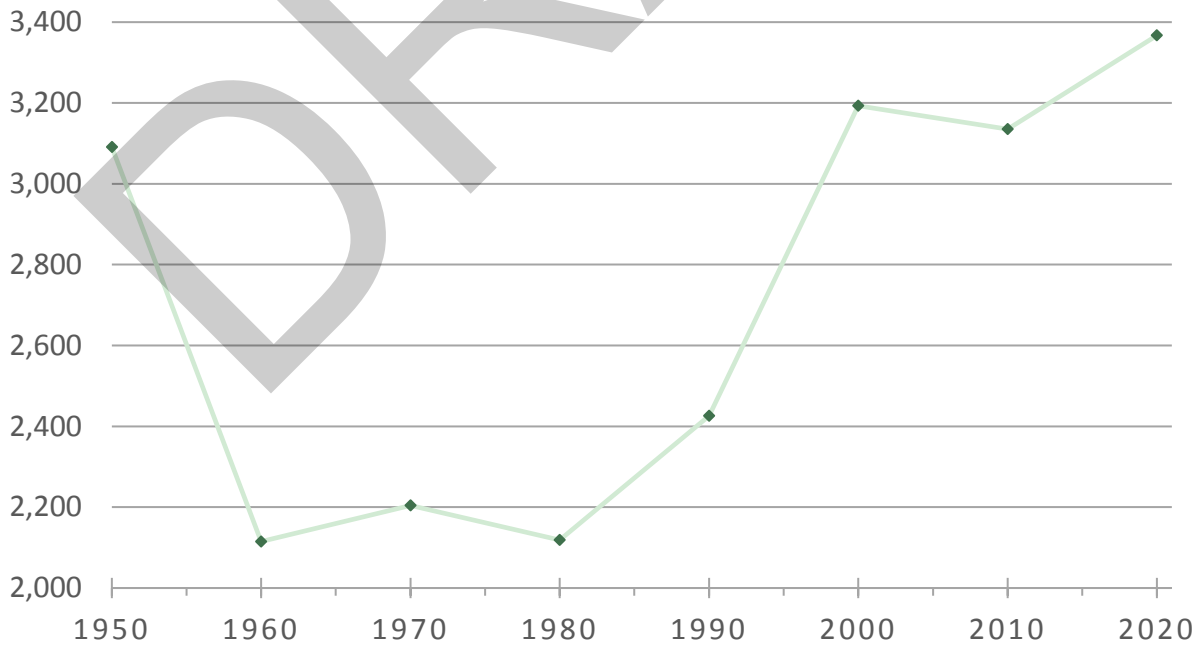
Historically, the population of Lāna'i has been correlated to the scale of the pineapple industry and then the resort businesses. Estimated at around 200 residents in 1890, the population swelled as the pineapple plantation expanded, with significant in-migration from the Philippines and Japan. In common with Maui County demographics, Lāna'i experienced a postwar outmigration as increased mechanization reduced the need for field labor. Despite the phasing out of the pineapple operation, the construction and opening of the island's resorts resulted in significant population growth (an increase of 51%) between 1980 and 2000. In the most recent 20-year period, the population stabilized, rising by a more modest 5%.

Population of Lāna'i (1950 – 2020)

Year	Population	Percentage Change (%)
1950	3,091	
1960	2,115	-32%
1970	2,204	+4%
1980	2,119	-4%
1990	2,426	+15%
2000	3,193	+32%
2010	3,135	-2%
2020	3,367	+7%

Source: U.S. Census Bureau

Lāna'i Population (1950 – 2020)



Source: U.S. Census Bureau

It should be noted that Census Bureau 2020 American Community Survey (ACS) data estimate the Lāna'i population as 2,888, a difference of 479, or 14% less. Responding to an inquiry to explain the difference, the DBEDT population statistics office advised that ACS data should be regarded with caution because of data collection issues during the COVID-19 pandemic. Census results include mitigation of a non-response bias, so that the two sources of data from the U.S. Census Bureau might best be interpreted as providing a range of population in 2020, from 2,888 to 3,367.

As reported in the Lāna'i Community Plan 2016, Pūlama Lāna'i estimates that the island resident population could reach approximately 6,000 within 20 years if its development plans are realized.

The ethnicity of Lāna'i's population is noticeably different than the rest of Maui County, as the following table indicates. Data are taken from the 2010 Census as 2020 Census data are not yet available. The predominant ethnicity – Asian – is almost double the proportion for the County as a whole, and Caucasians are less than half of the proportion in the County.

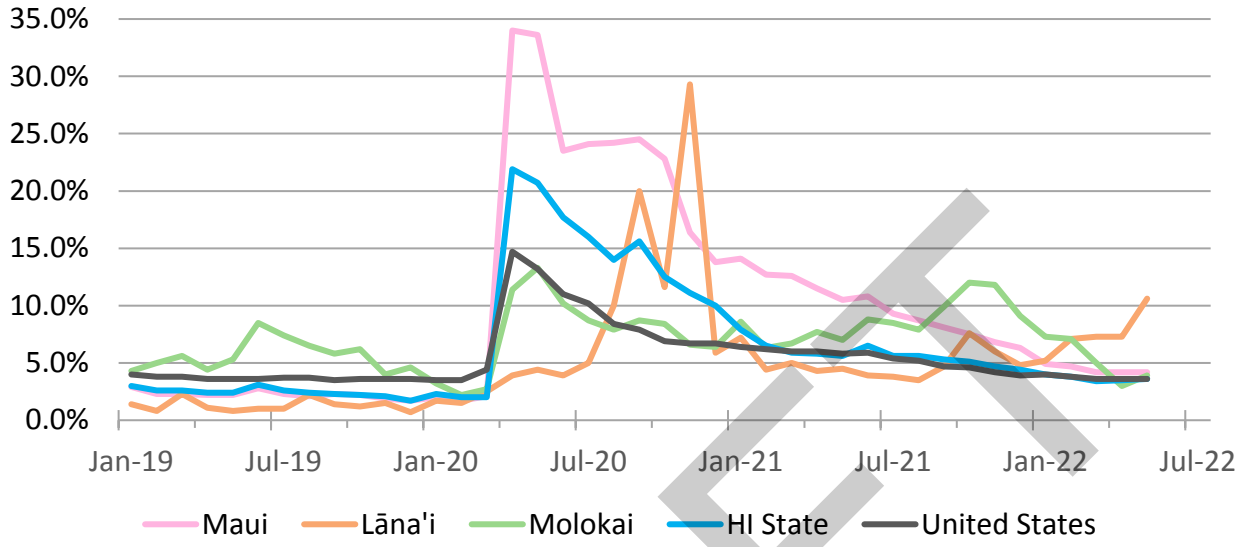
Ethnicity of Lāna'i Population Compared to All Maui County (2010)

Ethnicity	Lāna'i	Maui County
Asian	56%	29%
2 or more Races	23%	23%
Caucasian	14%	36%
Native Hawaiian/ Pacific Islander	7%	11%
Other Ethnicity	<1%	<1%

Source: U.S. Census Bureau
Note: 2020 Census data by ethnicity expected May 2023

Employment on Lāna'i has remained noticeably resilient since the "Great Recession" of 2008-09 and the profound job loss and rise in unemployment rate during the COVID-19 pandemic on Maui Island was not replicated to quite the same extent or for such a prolonged period on Lāna'i (see orange line in chart below) due to support by Pūlama Lāna'i, although rates spiked in late 2020 before dropping, and have again trended upward in 2022.

Unemployment Rates in Percentage of Maui County Islands State of Hawaii and United States (2019 – 2021)



Source: DLIR

While the population of Lāna'i increased by 5% between 2000 and 2020, numbers in the labor force (data exclude agriculture) have declined, stabilizing for the most part following the marked drop following the "Great Recession" of 2008-09. The job count fell by 23% between 2007 and 2011.

Lāna'i Labor Force: Job Count (2000 – 2021 Annual Averages)

Year	2000	2001	2002	2003	2004	2005	2006	2007
Job Count	1,800	1,800	1,750	1,700	1,650	1,650	1,750	1,750
Year	2008	2009	2010	2011	2012	2013	2014	2015
Job Count	1,700	1,600	1,350	1,300	1,400	1,500	1,500	1,400
Year	2016	2017	2018	2019	2020	2021		
Job Count	1,400	1,400	1,600	1,600	1,500	1,600		

Source: DLIR
Notes: Numbers rounded by DLIR and exclude Agriculture

Lāna'i Job Count (2000 – 2021 Annual Averages)

Source: DLIR

A more detailed analysis of the job count by industry, collected by the State Department of Labor and Industrial Relations (DLIR), shows the predominance of jobs in the resort and hospitality sector, and related vendors:

Lāna'i Job Count by Industry (2021 Annual Average)

Type of Jobs	Number of Jobs
Total Jobs	**1,600**
Private Jobs	**1,400**
Leisure & Hospitality	700
Professional & Business Services	200
Trade, Transportation & Utilities	100
Education & Health Services	100
Financial Activities	50-100
Other services	50-100
All Other	150-200
Government	**200**

Source: DLIR

Notes: Numbers rounded by DLIR and exclude Agriculture. Government data mostly State employees, including DOE and UH. "Other" category includes Information, Construction, and Manufacturing

Decennial Census data disaggregates labor force data by different categories. 2020 Census data by industry for Lāna'i will only be available in 2023, but 2010 data distribution are instructive:

Lāna'i Labor Force by Industry (2010)

Types of Industry	Number of Jobs in Industry	Percentage
Total Primary Jobs	951	100.0%
Accommodation, Food Services	574	60.4%
Management (companies/business)	118	12.4%
Arts, Entertainment, Recreation	55	5.8%
Retail & Wholesale Trade	47	4.9%
Real Estate, Rental/Leasing	47	4.9%
Healthcare & Social Assistance	27	4.9%
Construction	20	2.1%
Administration, Waste Management	18	1.9%
Transportation, Warehousing	17	1.8%
Utilities	10	1.1%
Finance & Insurance	9	0.9%
Other Services	5	0.5%
Agriculture, Forestry, Fishing	4	0.4%

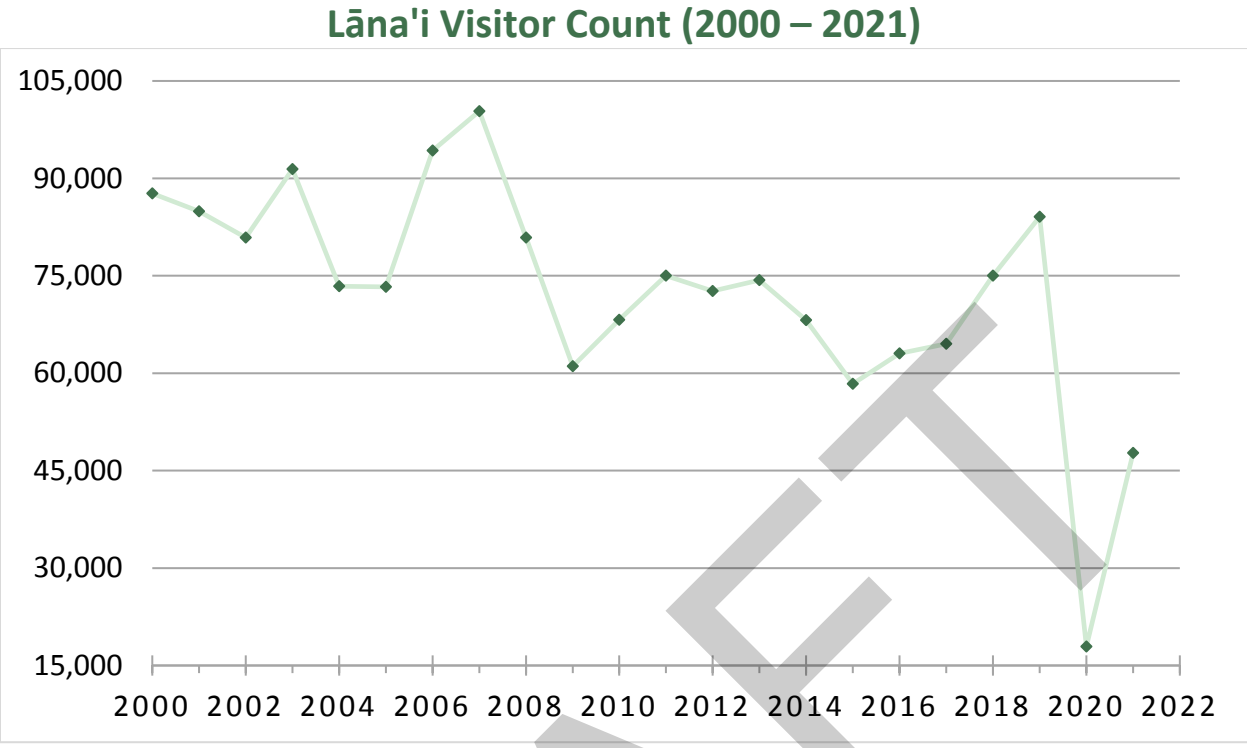
Source: U.S. Census Bureau
Notes: Only includes jobs covered by unemployment insurance. Includes Federal jobs but excludes State and County jobs

Given the importance of the visitor industry to the Lāna'i economy, the trend in numbers pre-COVID-19 remained stable from 2009 at the end of the "Great Recession" before plummeting during the pandemic, in common with the rest of Maui County.

Lāna'i Visitor Count (2000 – 2021)

Year	2000	2001	2002	2003	2004	2005	2006	2007
Job Count	87,661	84,905	80,875	91,445	73,382	73,280	94,269	100,350
Year	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Job Count	80,867	61,054	68,205	75,004	72,649	74,310	68,150	58,390
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**		
Job Count	63,024	64,529	75,010	84,103	17,924	47,740		

Source: DBEDT



Source: DBEDT

Lānaʻi -- SWOT

Strengths
Resilient, close-knit, cohesive community – everyone offers help
Growth potential – with the right plan
Lack of traffic
Relaxed lifestyle/country living
Safe place to live and raise a family
Free dual-credit program at UHMC
Ability of some properties to garden and grow own food
Single K-12 school
Community willingness to try new things and learn from failure
Interest in creating career paths with local school

Other (1 each): Private nonprofit school with 40-year track record; Access to 1-meter telescope (providing education and jobs); Ability to control/limit growth; New Hawaiian immersion school; Plenty of zoned farmland; Cat sanctuary, a world-class travel destination that teaches visitors about the importance of native birds

Weaknesses
98% of island owned by single owner – single engine economy -- future uncertainty
Limited access to commercial property
Logistical isolation
Tourism: divided community (welcoming vs. discouraging)
Lack of affordable housing
Too many invasive species
Lack of specialized medical services
Lack of economic diversity
Lack of volunteerism
Many have to work multiple jobs
Limited hiring pool restricts growth
Lack of political involvement
Limited transportation options to/from Lāna'i
No Farmers Market
Recent influx of newcomers brings uncertainty
Mentality that billionaire owner should fund Lāna'i and County should focus on Maui/Molokai

Other (1 each): Lack of locations for job diversity training; Limited support for Hawaiian immersion school; Private water system/lack of surface water; Lack of long-term care facility for kūpuna; Lack of financial literacy education for youth; Community scared of disruptive technology; Contractors/trades reluctant to work on homes; ILWU impotent; Imbalance of power in the community (in favor of Pūlama Lāna'i); Big dreams are a long process.

Opportunities
Home business and remote working (esp. young people)
100-acre Ag Park
Energy independence
Earn and Learn: HS students part-time in workforce and received school credit
Increased employment opportunities
Parks – highly used
Carbon capture
Diversification of industries
Tech+Ag to combat climate change and provide food security
Easier access to government officials and reps
Home water collection
Grow the Hawaiian Immersion schools beyond elementary level

Other (1 each): Drone cargo (sea and air); New 200-acre industrial park; Increased revenue from property tax; Collaboration between LHES and business/trade schools; Neighbor island community collaboration to help support the needs of Lāna'i.

Threats
Lack of diversified economy
Limited on-island healthcare (incl. long-term care)
Excessive tourism
Local residents pushed out because of cost of living
Lack of transparency by billionaire landowner regarding Lāna'i sustainability goals
Invasive species (esp. roosters)
Substance abuse
Lack of licensed toddler/infant/home care
Minimal support for non-profits
Restricted air transportation)
Only 1 barge per week
Loss of talented young adults
Climate change causing limited aquifer recharge

Other (1 each): Lack of good data to make informed decisions for Lāna'i; Lack of teachers and high turnover so lack of consistency for students; Lack of access to land; Gentrification; Exponential growth in real estate prices and growth in short-term rental investments: Limited subsidy assistance for families in need; Dichotomy of supporting youth to leave and see the world vs. wanting them to stay and join the workforce; Ideas shut down due to past history/events; Transient workers not contributing to the community; State and County departments not fulfilling their responsibilities to Lāna'i.

Molokai

Priorities and Strategies

Priorities[88]

- **Restore forests with native plants and trees**
- **Create an aligned K-12 system in all Molokai schools to include sustainability, cultural relevance, service learning, STEM, and computer science**
- **Maximize locally sourced renewable energy to decrease electricity costs**
- **Build more attainable and accessible housing (incl. rent-to-own opportunities)***
- **Prioritize small business development**
- **Secure guarantees for maintaining barge service, especially for farming community (air freight too expensive)**

- Highlight Hawaiian culture as the leading epistemology in Maui Nui to protect home-grown intellectual property rights and encourage Native Hawaiian entrepreneurship
- Learn from Molokai as an incubator for proof of concept
- Transition/secure Molokai Ranch land and assets to community ownership
- Restore, protect and manage coastline, reefs and marine areas
- Increase Management/Resource Management training opportunities on-island (government offices, non-profits etc.)
- More investment in Agriculture and food production/Grow building materials and expand farms
- Establish a central community-based Research Hub so community can access information, data, research (e.g. indigenous rights) and collaborate
- Initiate a deer program (food resource, land protection, job creation)
- Upgrade Internet to high-speed fiber service to all Molokai residents
- Establish affordable inter-island transportation
- Establish `āina-based daycare facility for long-term care
- Teach financial literacy
- Address drought conditions and effects (e.g. high water bills)

Other (1 each): Establish a Directory of Volunteer Services (e.g. yard cleaning, building maintenance); Create a hurricane-rated shelter and resilience hub

* Suggested contribution via public comment: Create and implement policies and criteria for affordable housing projects that support the protection and contributes to the regeneration

[88] Priorities in boldface are those with the most consensus by Members of the Focus Group

of our natural resources, is culturally appropriate and is not restricted by “cookie cutter” templates or funding requirements that inflate housing costs.

Strategies

- School curricula to be ‘āina-based and teach sustainability at a young age
- Support preserving open space for cultural and ecological vitality
- Promote a subsistence economy to decrease dependency on imported goods and services
- Promote and support non-extractive economic development
- Know/share the legacies of Molokai (especially with youth)
- Address sea-level rise and County Council to plan for executing identified projects
- Support existing pathways towards resource sovereignty, incl. grassroots leadership
- Teach Ag in Molokai schools to inspire next-gen farmers
- Promote remote job opportunities for youth (esp. IT)
- Better determine the number and type of jobs needed
- Support efforts to restore fishponds and loʻi
- Support Homesteaders who are trying to start businesses and reduce red tape
- Require Community Service for MHS students for graduation
- Reduce numbers of MHS students leaving to attend boarding schools
- Support MHS goal of 100% graduation
- Take advantage of dark skies (lack of light pollution)
- Conduct Market Research study for Molokai residents only
- Create home-grown fertilizer from invasive species compost
- Build upon existing Molokai college campus programs
- Increase Vocational Tech programs at MHS
- Establish and implement a cap on population of Molokai based on carrying capacity data

Other (1 each): Protect freshwater sources from over-diversion

Molokai

Cluster Analysis

Molokai is the 5th largest island in the State and by land area and population, the 2nd largest in Maui County. Historically, Molokai's economy has seen numerous shifts since the closure in the 1970s and 1980s of the pineapple operations that long dominated its economy. In 2008, the closure of the 61,000-acre Molokai Ranch led to the loss of over 100 jobs and caused the closure of several related businesses, with a ripple effect across the economy. In recent years, Molokai has made progress in diversifying its economy, particularly in entrepreneurship.

Maui County Population by Island (2020)

Island	Population
Maui Island	154,100
Molokai	7,369
Lāna'i	3,367

Source: U.S. Census Bureau, 2020 Census
Notes: Kalawao County (82 residents) included in Molokai data. Kaho'olawe officially has no permanent residents.

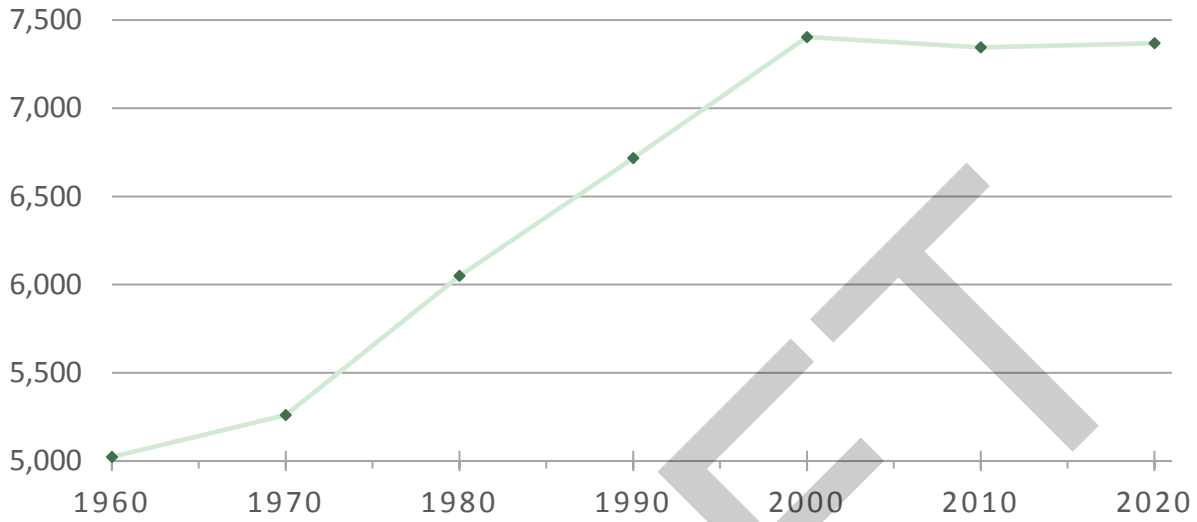
Population data and many economic indicators for Molokai are only available in decennial Census years. The population of Molokai has grown by almost half – 47% -- during the 60-year period 1960 to 2020, compared to the quadrupling for Maui County as a whole. As the following table and chart show, the three decades from 1970 to 2000 showed the most pronounced growth (41%) over the time period. Population numbers have stabilized since 2000.

Molokai Population (1960 – 2020)

Year	Population	Percentage Change (%)
1960	5,023	
1970	5,261	-4.9%
1980	6,049	+4.7%
1990	6,717	+11.0%
2000	7,404	+10.2%
2010	7,345	-0.8%
2020	7,369	+0.3%

Source: U.S. Census Bureau
Note: Includes Kalawao County (82 residents)

Molokai Population (1960 – 2020)



As shown in the following table, the ethnicity of Molokai residents differs from that of Maui County as a whole. Over two-thirds of the population self-report as Native Hawaiian or with ethnicity of two or more races; for Maui County as a whole, the proportion is one-third. Conversely, whereas Asians and Caucasians make up almost two-thirds (64%) of Maui County's population, these groups account for less than one-third (30%) of Molokai's.

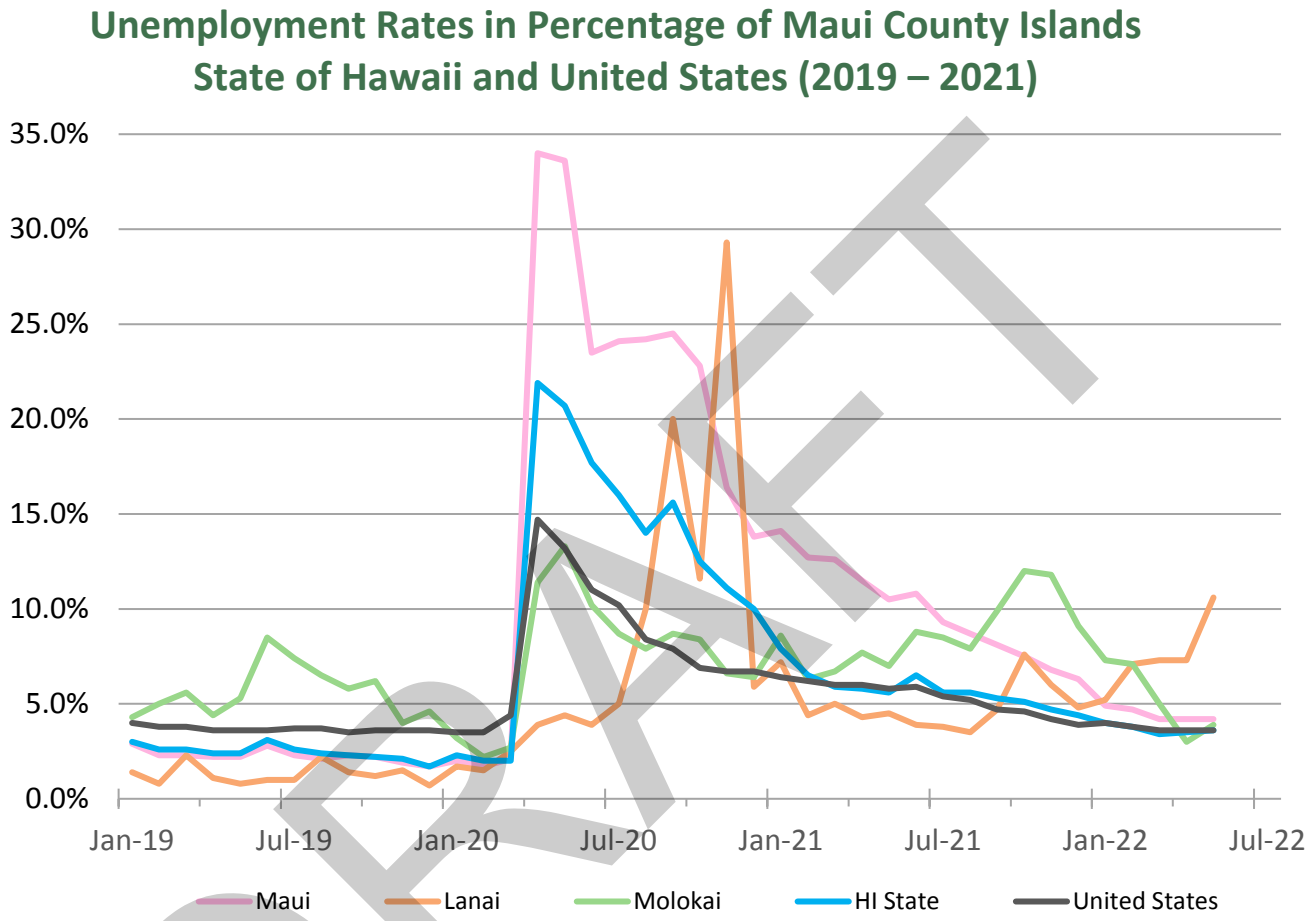
Molokai Population Data by Ethnicity (2020)

	Molokai	All Maui County
Total Population	7,369	164,221
By Ethnicity		
Native Hawaiian or Other Pacific Islander	44%	11%
Two or more Races	25%	24%
Caucasian (white)	16%	35%
Asian	14%	29%
Black, African American & Other	1%	1%

Source: U.S. Census Bureau, 2020 Census, and American Community Survey

Labor force numbers on Molokai have remained resilient since the "Great Recession" of 2008-09 and the closing of Molokai Ranch operations (and related businesses) in March 2008. The significant job loss and rise in unemployment rates for the County as a whole during the COVID-19 pandemic were not replicated to the same extent on Molokai. The chart below shows the national-high unemployment rate for Maui County (blue line), which reached 34% in April 2020, and the purple line representing the unemployment rate for Molokai which peaked at 12.6% in

June 2020. The rate gradually fell during the latter half of 2020, remaining well below the Maui County rate before rising during the COVID Omicron surge in late 2021, reaching 10.0 percent in October. Rates have remained elevated, since then, reaching 10.6% on May 2022.



Source: DLIR

The job count, collected by the State Department of Labor, has been stable over the last two decades, mirroring the demographic trend, with the notable exception of 2008 through 2011, for reasons noted above. The dip in jobs during the pandemic was far less dramatic compared to Maui County as a whole, illustrating the greater resilience of the Molokai economy, partly due to the significant subsistence economy and the comparative lack of dependence on the visitor industry.

Molokai Labor Force: Job Count (2000 – 2021 Annual Averages)

Year	2000	2001	2002	2003	2004	2005	2006	2007
Job Count	1,900	1,700	1,800	1,800	1,850	1,900	1,900	1,900
Year	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Job Count	1,850	1,800	1,600	1,500	1,600	1,600	1,700	1,800
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**		
Job Count	1,800	1,800	1,900	1,800	1,700	1,800		

Source: DLIR
Notes: Numbers rounded by DLIR and exclude Agriculture

Molokai Job Count (2000 – 2021 Annual Averages)

Source: DLIR
Notes: Numbers rounded by DLIR and exclude Agriculture

The Department of Labor does not include the significant subsistence or unofficial economy that exists on Molokai and that does not appear in any official data; this is estimated by informed residents as accounting for the equivalent of one-third of income and the "official" economy. Many residents continue cultural traditions of hunting and gathering, both on land and in the ocean, to provide food for family rather than recreational purposes. The traditions of

barter and trade are well established and not quantified in the data but are significant aspects of the overall economy.

In terms of the official job count recorded by the State Department of Labor and Industrial Relations, 2021 annual data show that almost 40% of all positions fall within the Government sector. These data also show that more than 40% of all jobs fall within the education and health sectors (including DOE and UH jobs).

Molokai Job Count by Industry (2021 Annual Average)

Type of Jobs	Number of Jobs
Total Jobs	**1,800**
Private Jobs	**1,100**
Education & Health Services	400
Leisure & Hospitality	200
Trade, Transportation & Utilities	300
Financial Activities	50-100
Professional & Business Services	<50
All Other Services	100
Government	**700**
State DOE & UH	400
State (other)	100
County	100
Federal	50-100

Source: Department of Labor and Industrial Relations
(a) Includes Social Assistance
Note: Numbers rounded by DLIR and exclude Agriculture

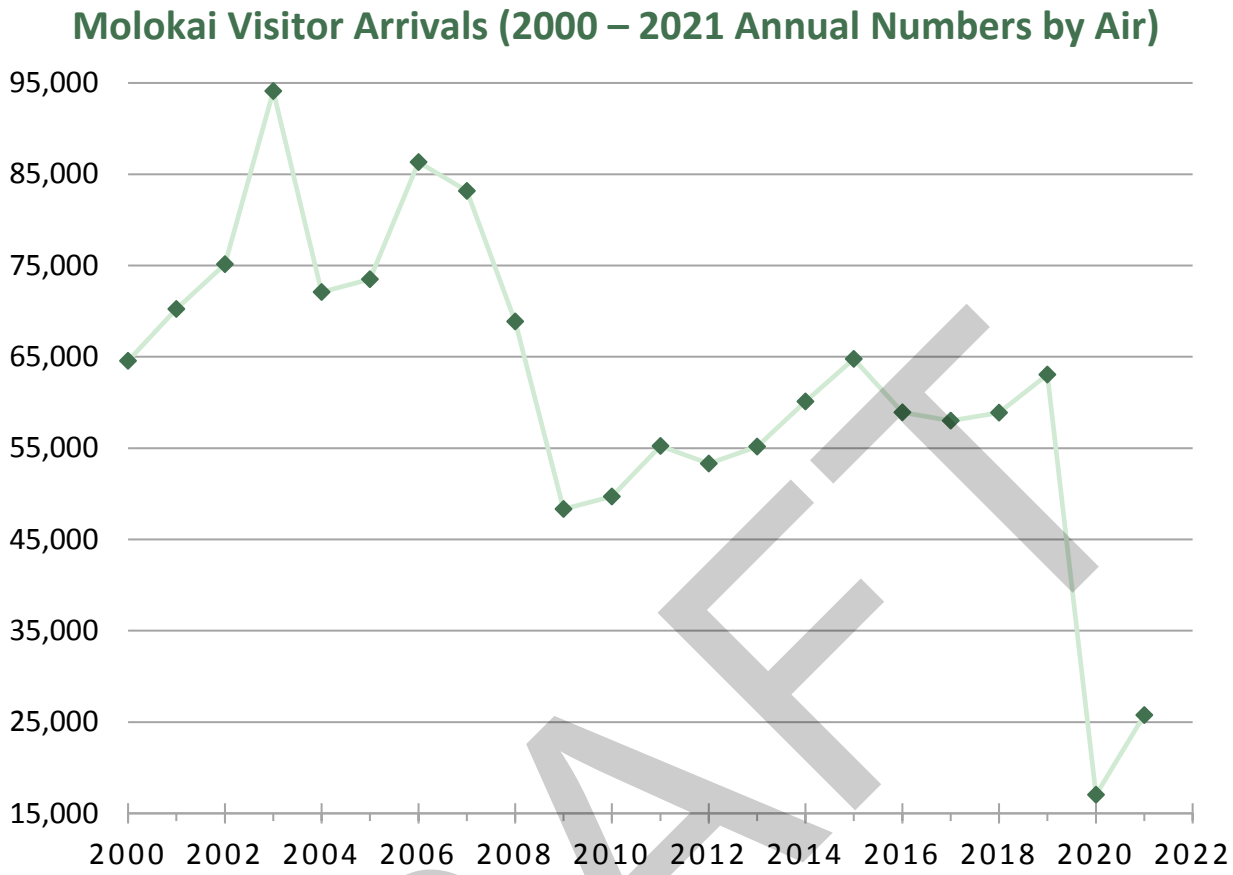
Decennial Census data disaggregates labor force data by different categories, and which include agriculture, aquaculture, fishing forestry and hunting. These data show just how important this sector is to the Molokai economy:

Molokai Labor Force by Industry (2010)

Industry	Percentage
Agriculture, Forestry, Fishing, Hunting *(a)*	30.7%
Healthcare & Social Assistance	19.3%
Retail Trade	13.8%
Accommodation & Food Services	9.9%
Miscellaneous Services	4.6%
Public Administration	4.0%
Transportation/Warehousing	3.5%
Construction	3.1%
Finance & Insurance	1.7%
Real Estate	1.7%
Professional, Scientific & Tech Services	1.1%
Wholesale Trade	1.1%
Manufacturing	0.8%
All Other	2.9%
Total	**100.0%**

Source: U.S. Census Bureau
(a) Includes aquaculture
Note: Includes jobs covered by Unemployment Insurance, Federal jobs; excludes State and County Jobs

In terms of visitor numbers, the closure of Molokai Ranch in 2008 saw a decrease of approximately 50% compared to the most recent peak year of 2003 (1992 saw over 115,000 visitors). Since 2009, visitor numbers gradually increased before plummeting to just over 17,000 in the peak pandemic year of 2020. Unlike Maui island and Lāna`i, Molokai visitor numbers have been far slower to approach pre-pandemic levels.



Source: DBEDT

Affordable housing has been as much, if not more than, an issue on Molokai as for the rest of Maui County. Recent data obtained from the Realtors Association of Maui (RAM) show that as of December 2021, the median price of a single-family dwelling is $540,000 on Molokai, compared to more than $1 million for the entire Maui Multiple Listing Service (MLS). For Molokai, this represents an increase of over 117% since December 2015, compared to 68% for the entire MLS. (It should be noted that some Molokai real estate sales data is reported to the Honolulu Board of Realtors instead of RAM.)

Molokai -- SWOT

Strengths
Molokai residents: Close-knit community with honesty and trust
Resiliency of youth and residents and long history of self-determination
Sust'āinable Molokai – responding to priorities identified by the community
Community involvement and collaboration and community control of future
Generational families remaining on Molokai
Collaboration of non-profits/Numerous aloha 'āina non-profits
Generational knowledge of place and resources passed own by kūpuna to 'ōpio
Community not dependent on tourism
Mālama 'āina
Community adaptability
Entrepreneurship and entrepreneurial mindset
Determination to live self-sufficiently without reliance on imports
Rich natural resources and space to grow more
Family-oriented, 'ohana lifestyle
New generation of young servant-leaders
Resourcefulness
Large Native Hawaiian community
Wide range of skills/trades on offer
Low crime
Subsistence resources help offset high cost of living
Groundwater protection
Multiple active, working fishponds
Increasing interest on lo'i restoration
Plenty deer
North Shore valleys
Diversified agriculture

Other (1 each): Willingness of volunteers to advance Molokai initiatives; Desire for off-grid and renewable energy and Green Building; Molokai reef protected by Maui and Lāna'i; Teacher collaboration easy in small community; Effectiveness of MISC; Strong identity as kupa'āina of Molokai; Cohesive community goal of leaving a legacy for keiki; Kalaupapa and its legacy; Accountability; More controlled environment due to geographic isolation

Weaknesses
Limited transportation options and high cost of travel
Lack of affordable housing (incl. short-term housing for interns)
Lack of place-based governance
Lack of opportunities to keep local talent and youth on-island
Threat of sea-level rise
Lack of medical specialists and medical services
High shipping costs for goods
Lack of accommodation options for kūpuna/Lack of kūpuna housing
Long-time residents not heard (esp. kūpuna)/Elderly not being or staying informed
One-third of island is owned by a foreign corporation (Molokai Ranch)
Lack of access to Molokai-specific data
Unsustainable water extraction and use
Overpopulation of deer
Lack of place-based education/curriculum
Cost of living – things too expensive
Lack of bike lanes/bike paths (alternative transportation
Lack of Native Hawaiian practices driving mental health
Lack of fun places/things to do (youth get bored)
Upkeep/maintenance of homes and businesses
Geographical isolation
Lack of funds for facilities and teachers at Molokai schools
Lack of daycare for babies and toddlers
Maui County Code does not allow many sustainable/eco-design/'ohana housing types
Lack of teacher Face-to-Face professional development opportunities
Lack of pet advocacy and general care
Poor communication between County/State/Federal agencies

Other (1 each): Drug use (esp. meth); Broken roads; Expensive internet/wifi; Need more focus on kūpuna council; Lack of cooperation/unification amongst service-providing organizations; Lack of long-term and residential treatment for aging and high-needs residents; Climate change and natural resource depletion; Helicopters from Maui; Lack of food security for some families; Difficulty competing with large businesses; Lack of community consensus and common goals on resolving problems

Suggested additions via public comment:
Majority of County facilities and operations on Molokai Ranch land and not owned by County of Maui; Lack of emergency food storage and cold storage facility (incl. mass casualties)

Opportunities

Renewable Energy (RE): Community plan for 100% RE (CERAP)/Achieve 100% renewable energy by 2045/Community leadership in energy planning and development/Community-owned energy

Increase local farmer and grower production/ Increase food security to avoid reliance on imports

Record kūpuna manaʻo and moʻolelo while we still can/Develop oral history program

Create resiliency hubs

Support new small businesses

Create a community-based research hub

Promote workforce development

Create community events that support local vendors

Asset mapping to determine inventory and needs

Restore forests with native plants

Grassroots leadership

Protect open and cultural spaces

Create a Molokai-specific climate change plan

Improve waste management and reduce/reuse/recycle

More remote job opportunities for residents

Utilize Hawaiian lunar methodology to restore and protect natural resources

Utilize deer resource

Facilitate return of youth

Educate on the culture and essence of Molokai

Prioritize the needs of our students

Expand on Hawaiian healing practices and traditions

Develop entrepreneurship opportunities for farming

Create new job prospects

Other (1 each): Expansion of college programs; Establish more restaurant/food vendor options; Access to tech training (e.g. classes on Zoom); Increase scholarships as incentive for youth leaving for education to return or give back

Threats
Sea level rise and flood risk
Invasive species
Transplants who want to change Molokai and treat residents as outsiders
Land and housing too expensive for residents to buy; Realtors selling for the wrong reasons
Tourism (incl. how people define it)
Worsening drought conditions
Expanding deer population
Lack of reliable and affordable inter-island transportation
Long-time residents feeling uncomfortable speaking up and being heard
Lack of water availability for homestead farming
Depletion of natural resources
Loss of vegetations due to poor land-use practices and feral ungulates
COVID
Lack of hurricane and tsunami shelters
Arguing instead of collaborating on common goal

Other (1 each): Monocrop agriculture; Inflation; Limited number of contractors; Competition between services; Lack of understanding the needs of our students and teachers; high utility costs (esp. water bills); displacement of kānaka; land speculation

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Evaluation and Performance Measures

For any plan to be deemed successful, measurement and evaluation of progress towards stated goals are key; they can also determine where gaps exist and the extent of any shortfall. By using indicators and data that can be easily collected at regular intervals and lend themselves to benchmarking against historical performance or against the performance of others, it will be possible to determine which priorities and strategies are meeting with success and what adjustments need to be made.

In 2021, Maui Economic Development Board published Trends Maui Nui 2020, a compendium of historical data with narratives covering the 2005 to 2020 period with the purpose of informing effective and appropriate decisions for the future. This initiative came out of the landmark Focus Maui Nui community engagement process that brought nearly 1,700 residents into a consultative process to determine the vision and values that should drive the future of the county. Trends Maui Nui 2020 serves as a model for benchmarking indicators demonstrating progress – or lack of progress – across a wide range of demographic, environmental, economic and social issues.

As a model for evaluation and performance measures, Trends Maui Nui 2020 quantifies indicators in three broad categories: People (demographics, health and social services), Place (environment, infrastructure), and Purpose (economic development, education). Adapting these metrics to the priorities and strategies contained in the 2022 CEDS, the following framework provides examples of indicators that will inform both quantitative and qualitative progress over the course of the next five-year period.

Note: Indicators in green typeface below indicate examples of cluster Focus Group Priorities.

Indicators	**Baseline Data**			
	2005	**2010**	**2020**	**2022-2026**
Overarching – Economy				
Gross Domestic Product (GDP)	√	√	√	
GDP per capita	√	√	√	
Population	√	√	√	
Net migration	√	√	√	
Household/Per Capita Income	√	√	√	
Minimum Wage	√	√	√	
Income Inequality				
Access to Capital				
Net Capital Investment				
Numbers of Businesses (& by Employee Size)	√	√	√	
Business Startup #s				
Overarching -- Labor Market				
Total Labor Force	√	√	√	
Numbers Employment	√	√	√	
Numbers Unemployed	√	√	√	
Underemployment				
Jobs Created				

	2005	2010	2020	2022-2026
Overarching -- Social Characteristics				
% ALICE			√	
Poverty Rate	√	√	√	
Health Insurance Rate		√	√	
Homelessness	√	√	√	
Crime Rate				
Access to High Speed Broadband				
Overarching – Education				
Preschool Education #s	√	√	√	
Teacher Salaries	√	√	√	
K-12 public school enrollments	√	√	√	
K-12 private school enrollments		√	√	√
Home school students				
HS Graduation Rates	√	√	√	
HS Diplomas			√	
HS Proficiency Levels	√	√	√	
CTE completions			√	
Higher Education Rates	√	√	√	
Attainment Rates	√	√	√	
Post-Secondary Credentials	√	√	√	
Cluster Data				
Agriculture				
Establish municipal composting facility				
Develop local producer co-operatives				
Data count of Ag sector paid employees	’07	’12	’17	’22
Data count of Ag sector unpaid/family employees	’07	’12	’17	’22
Attainable Housing & Construction				
Changes in County permitting process				
Number of skills training courses				
Attainable Housing Units completed			√	
Home Ownership Rate	√	√	√	
Median Home Price	√	√	√	
Median Condo Price	√	√	√	
Median Rental Price	√	√	√	
Creative Industries				
Creation of funding support mechanism				
Establish shared production multi-media facility				
Job Count	√	√	√	
Average Earnings	√	√	√	

	2005	2010	2020	2022-2026

Eco-Economy

Establish a Maui County Environmental Testing Lab
Creation of Sustainability Plan for Conservation/Biosecurity
"Green" job #s
Water Consumption
Water Quality
Reef Monitoring/Quality
Invasive Species
Acreage Protected/in Conservation
Net Loss of Agricultural/Forest Lands
Condition of Natural Resource Attractions
Greenhouse Gas Emissions
Climate Change Indicators
Volume of Solid Waste
% Waste Diversion (recycling etc.)

Energy

Tax credits and grants for renewable energy adoption
EV Charging Stations
Numbers of EVs
% Electricity Generation via Renewable Energy
Utility Customers
% with access to PV (equity of access)

Hawaiian Knowledge and Culture

Funding opportunities identified for NH businesses
DHHL waiting list numbers
Native Hawaiian Indicators (cultural, health, etc.)
Native Hawaiian Entrepreneurship (NH owned businesses)
DHHL Waitlist #s
Native Hawaiian community groups
Native Hawaiian non-profits
Native Hawaiian cultural practitioners
In-stream water data

Healthcare and Wellness

Create predictive model for workforce needs
Pilot a people-based (not insurance-based) delivery model
Job Count
Average Earnings
Number of Hospital Beds
Resident: Physician ratio
Healthcare Professional Shortfalls
Nurses
Physicians
Other key personnel

	2005	2010	2020	2022-2026

Science, Technology and Innovation
Creation of incubator/accelerator facility
Create online local tech recruitment tool
Job count
Average earnings
Number of tech businesses
Number of startups

Visitor Industry
Visitor Numbers (annual)
Visitor Daily Census
Ratio of Daily Census #s and Residents
Visitor Spending
Hotel Occupancy Rates
Eco-Tourism Destinations

Hāna
Create plan for Hāna Civic Center
Track increase in Hāna Business collaboration
Creation of highway safety and stabilization plan

Lāna'i
Track attainable housing plans on County land
Establish long-term care and kūpuna home retrofits
Creation of Ag Park
Job count

Molokai
Track initiative for forest restoration
Amount of locally-sourced renewable energy
Cost of electricity
Progress in aligned K-12 sustainability and STEM curriculum
Job count

Gathering and maintaining a database of these indicators on a consistent and regular basis will require significant funding, as well as planning mechanisms for data collection where none currently exists (e.g. Number of performing Hālau, GHG data by source, acreage lost to sea level rise and coastal erosion, percentage of property ownership by non-residents, number of home schooled students, number of business closures, number of multi-job holders, percentage of food imports by category).

Glossary and Acronyms

A/C	Air Conditioning
ACS	American Community Survey (U.S. Census Bureau)
AFRL	Air Force Research Laboratory
Ag	Agriculture (abbreviation)
ALICE	Asset Limited, Income Constrained, Employed (Aloha United Way study)
AMI	Annual Median Income
BA and BS	Bachelor of Arts and Bachelor of Science
BLS	Bureau of Labor Statistics (U.S. Department of Commerce)
CEDS	Comprehensive Economic Development Strategy
CEO	Chief Executive Officer
CERAP	Community Energy Resilience Action Plan (Molokai)
COVID-19	**Co**rona **Vi**rus **D**isease (first identified in 20**19**)
DBEDT	Department of Business, Economic Development and Tourism (Hawai'i)
DHHL	Department of Hawaiian Home Lands (Hawai'i)
DLIR	Department of Labor and Industrial Relations (Hawai'i)
DMAP	Destination Management Action Plan
DOD	Department of Defense (Federal)
DOH	Department of Health (Hawai'i)
DOT	Department of Transportation (Hawai'i)
EDA	Economic Development Administration (U.S. Department of Commerce)
EMSI	Economic Modeling Specialist International (private company)
EMWP	East Maui Watershed Partnership
ESRI	Environmental Systems Research Institute (private company)
ER	Emergency Room
FMR	Fair Market Rent
FPL	Federal Poverty Level
FT	Full-time
HC&S	Hawaiian Commercial & Sugar (the last large-scale sugar producer in the State)
HDOA	Hawai'i Department of Agriculture
HECO	Hawaiian Electric Company
HELCO	Hawai'i Electric Light Company (Big Island utility)
HILT	Hawaiian Islands Land Trust (former acronym)
HLT	Hawai'i Land Trust (current acronym, from 2021)
HS	High School
HTA	Hawai'i Tourism Authority
HUBZone	Historically Underutilized Business Zone
HUD	Housing and Urban Development (U.S. Department)
ILWU	International Longshore and Warehouse Union
K-12	Kindergarten through 12th grade
KITV	Call sign of Honolulu-based TV station (ABC affiliate)
KIUC	Kaua'i Island Utility Cooperative

kWh	Kilowatt Hour (unit of energy)
LEED	Leadership in Energy and Environmental Design
LHES	Lāna`i High & Elementary School
LLC	Limited Liability Company
MACC	Maui Arts and Cultural Center
MCCAHP	Maui County Comprehensive Affordable Housing Plan
MECO	Maui Electric Company
MEDB	Maui Economic Development Board
MEO	Maui Economic Opportunity
MHI	Median Household Income
MHS	Molokai High School
MISC	Maui Invasive Species Committee
MMMC	Maui Memorial Medical Center (Hospital)
mW	Megawatt
NAICS	North American Industry Classification System
NH	Native Hawaiian
NHCoC	Native Hawaiian Chamber of Commerce
NIMBY	Not In My Back Yard
OGG	Kahului Airport code letters (named after pilot Jim H**ogg**)
OHA	Office of Hawaiian Affairs
PCI	Per Capita Income
PI	Pacific Islander
PV	Photo-voltaic
RAM	Realtors Association of Maui
RE	Renewable Energy
R&D	Research and Development
R&T	Research & Technology Park (in Kihei)
SBA	Small Business Administration (U.S. Department of Commerce)
SMA	Special Management Area
STEM	Science, Technology, Engineering and Math
SWOT	Strengths, Weaknesses, Opportunities and Threats
TV	Television
UH	University of Hawai‘i
UHERO	University of Hawai‘i Economic Research Organization
UHMC	University of Hawai‘i Maui College
UN	United Nations
US	United States
USDA	U.S. Department of Agriculture
USSF	U.S. Space Force
VRBO	Vacation Rentals By Owner (private online company)

Appendix 1. Resiliency in Maui County: Plans and Actions

2020 Maui County Hazard Mitigation Plan Update
https://www.mauicounty.gov/DocumentCenter/View/125977/2020-Maui-County-Hazard-Mitigation-Plan-Final
The comprehensive, 1,044-page County Plan was developed by the Maui Emergency Management Agency and issued in August 2020, updating the previous Multi Hazard Mitigation Plan issued in August 2015. The subtitle of the Plan, included on the cover page, reads: "Protect people, the environment, the local economy, and infrastructure from natural hazards and climate change." It was created as an ongoing effort to reduce the negative impacts and costs from damages associated with hazards and threats. The publication is a Masterplan for all of Maui County, identifying hazard mitigation actions and activities to reduce losses from extreme events such as earthquakes, tsunamis, tropical cyclones (hurricanes), flooding, significant beach erosion, wildfires, drought, highway rockslides, and technological disasters. It establishes priorities and long-term sustained processes to implement mitigation actions.
The plan was developed through "a community-driven project approach that included interviewing key stakeholders, hosting public meetings, and distributing public preparedness surveys. The Steering Committee included but not limited to, the Maui County Planning Department, the Maui Visitor's Bureau, the Maui County Department of Public Works, and the chief executive officer of Feed My Sheep and chair of Voluntary Organizations Active in Disaster."

Working with a consulting team led by Jamie Caplan Consulting LLC, the Maui Emergency Management Agency formed a Steering Committee of County Leaders to inform the update process. The process involved interviewing key stakeholders, hosting public meetings, distributing a public preparedness survey and review of the draft plan. The Steering Committee hosted three public meetings in February 2020, one in each of the following locations: Central Maui, Molokai and Hāna. Additional public meetings will be held in April 2020. The plan was subsequently approved by the Federal Emergency Management Agency (FEMA).

The Plan chapter organization is as follows:

- Introduction and Assurances
- Maui County Profile
- Planning Process
- Risk and Vulnerability Assessment
- Capability Assessment
- Mitigation Strategy
- Plan Implementation and Maintenance

- Five appendices with data and supporting materials are also included in the Plan.

Molokai Climate Change and Sea Level Adaptation (CCSLAR) Plan

This resiliency plan is currently being prepared by Sustʻāinable Molokai, a non-profit community development organization "committed to restoring `āina momona (abundant land) by uniting traditional practices with responsible and modern sustainability solutions." Their programs include food security and sovereignty, agricultural education, energy resilience, conservation, and conscious climate change.

The main elements and characteristics of the CCSLAR plan are as follows:

- Using an indigenous place-based perspective—meaning the planning process will be led/driven by Molokai kamaʻāina and long-time community leaders
- Incorporating appropriate technical land-use planning and coastal engineering expertise
- Utilizing this process as an opportunity to engage and develop the next generation of local leaders
- Resulting in an action-oriented document that identifies the key climate change issues and ways to build greater community adaptability, resilience, and capacity in the years ahead

Maui County Office of Climate Change, Resiliency, and Sustainability (CCRS)

The County of Maui Mayor's Office established the CCRS "to support a sustainable, equitable, climate-safe future for Maui Nui by providing access to information and resources while advocating for our community's most critical environmental concerns. CCRS focuses primarily on climate mitigation, decarbonization, and adaptation; within that, the Office focuses on initiatives related to environmental protection, energy and clean transportation, green buildings, and resilient housing." The Office has recently launched an online Climate Action Engagement (ClimATE) hub to provide information and resources on climate action and resiliency. It addresses how the County of Maui is working to reduce greenhouse gas emissions, adapt to the projected impacts of climate change (such as sea-level rise and hazardous weather events), and strengthen community resiliency to ensure an equitable and sustainable future for current and future generations.

Among specific current and planned CCRS initiatives are:

- Establishing a baseline of Greenhouse Gas (GHG) Emissions
- Identifying climate vulnerabilities
- Identifying mitigation and resiliency strategies
- Modeling carbon impacts
- Developing an implementation roadmap

As the https://www.resilientmauinui.org/ website describes, CCRS is in the process of developing a Countywide Climate Change Vulnerability Assessment for Maui County, "which will build off of existing County departmental vulnerability assessments, the County's multi-hazard mitigation plan, and other community plans and community vulnerability assessments that are complete or are currently underway. This planning effort aims to provide an integrated, high-level climate change vulnerability study that can help guide County policies, projects, and budget priorities to address climate change vulnerabilities."

Maui County Council Climate Action, Resilience, and Environment (CARE) Committee

The County Council of Maui has established a Committee specifically concerned with issues relating to resilience, climate change and the environment. Specific issues falling within its oversight include:

- Sea-level rise, shoreline erosion, managed retreat, deforestation, drought, wetlands, carbon emissions, pollution, and other related contributors to climate change
- Protection, preservation, and enhancement of the environment, including recycling
- Animal management and related grants
- Energy, including solar, geothermal, wind, biomass, hydropower, wave energy production, biofuel and synthetic fuel production, power systems, and energy-efficient technologies for building
- Oversight of the Maui Emergency Management Agency and the Department of Environmental Management's Environmental Protection and Sustainability Division
- Implementation of the following General Plan objective: Protect the Natural Environment.

County of Maui Department of Environmental Management (DEM)

The DEM Environmental Protection and Sustainability Division (EP&S) "was established in 2016 within the Department to guide and fund environmental initiatives around natural resource protection, sustainability, conservation, and restoration. The Division fosters partnerships with government agencies and community leaders to enforce environmental legislation and support innovative programming, community-based initiatives, and public education. EP&S is committed to building a sustainable community with Mālama ʻĀina as its guiding principle." Sections within EP&S are: Recycling and Household Hazardous Waste Collection; Abandoned Vehicles, Metals, & Litter Control; and Environmental Programming, focusing on a wider set of environmental issues affecting Maui County.

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Appendix 2: Maui County Community Economic Survey

CEDS Online Survey

In order to augment the Focus Group discussions and findings, and to engage a wider community, MEDB posted an online Social Media survey in June 2022, requesting that respondents prioritize the economic sectors identified by the Strategy Committee. The principal question asked was:

Which of the following sectors should we prioritize to create economic resilience and prosperity for Maui County?

The nine clusters already identified in this report were listed on the survey and respondents could indicate priorities on a scale of 1 to 5, with 1 being lowest priority and 5 being the highest. Respondents were also asked demographic questions (home and work locations, age range, gender, occupation, etc.). The ranking of priority clusters based on 589 responses were as follows:

Cluster	Average Ranking
Attainable Housing and Construction	4.19
Energy	4.08
Agriculture	4.06
Healthcare and Wellness	4.03
Eco-Economy	4.03
Hawaiian Knowledge and Culture	3.75
Science, Technology, and Innovation	3.35
Creative Industries	3.15
Visitor Industry	2.34

Demographics of Respondents

One aim of the online survey was to maximize reach and particularly to younger residents who tend to spend more time online than older age groups. Surprisingly, despite using both Instagram and Facebook, survey respondents were not representative of the population of Maui County as whole in terms of age. In particular, the 45- to 64-year-old age group was overrepresented:

Age Range	Percentage of Total *(%)*
Under 18	2.3%
18 – 24	1.4%
25 – 34	8.8%
35 – 44	20.3%

45 – 64	44.1%
Over 65	23.1%

Gender and Ethnicity

Of the 589 respondents, 82% specified gender and of these, 61% were female and 39% male. In terms of self-reported ethnicity, 54% were Caucasian, 18% wholly or partly Native Hawaiian, 15% Asian, and 4% Hispanic. African Americans, Native Americans, Pacific Islanders and Aleuts made up 4% and 8% reported "Other" (e.g. two or more races).

Length of Time Living in Maui County

About three-quarters of respondents (76%) reported they had lived in Maui County for 10 years or more, with 24% reporting they had lived in the County for less than 10 years. Confirming the age demographic data, 37% of the total had lived in Maui County for 30 years or more.

Home and Work Location

Location data did show a wide geographical distribution, but not necessarily representative of the population at large – for example, about one-third of County residents live in Central Maui and fewer than 10% Upcountry.

Location	Home	Work
Central Maui	22%	29%
South Maui	21%	19%
Upcountry Maui	19%	11%
West Maui	17%	16%
North Shore	12%	7%
Molokai	3%	5%
Lāna'i	2%	2%
East Maui	2%	2%
Other	2%	19%

Occupation

The 589 survey respondents reported 814 occupations. Of the occupations specified, 11% were retired (confirming the age demographic). The industry distribution was as follows:

Industry	Percentage of Occupations *(%)*
Visitor Industry	22%
Tourism and Hospitality	11%
Food and Beverage	3%
Retail	8%
Business	10%
Education	9%
Healthcare	8%
Non-profits	8%
Science and Technology	6%
Agriculture	6%
Government	5%
Construction	3%
Social Services	1%
Retired	11%
Student	3%
Other Occupations	9%

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Appendix 3. Focus Group Participants

The participants from the 11 Focus Group meetings are listed alphabetically. Several attendees attended more than one group; total Focus Group attendance was 212 (an average of over 19 per Focus Group). Adding the 37 Strategy Committee members (the committee convened four times) and the 589 online survey respondents, 838 Maui County residents participated directly in the 2022 CEDS process.

Abdul	Cassandra
Afelin	Momi
Albitz	Gary
Aquinde	Joshua
Artates	Wailani
Balala	Rudy
Bennett	J. Mathias
Boese	Max
Braun	Brenda
Buchanan	Moku and Lori
Caires	Kyle
Campbell	Rachel
Ching	Josiah
Chow	Leilani
Churchill	Ryan
Costales	Kanani
Crall	Rebecca
Crawford	Scott
Cunningham	Jud
Davis	Ned
De la Nux	Isaac and Konane
De Rego Jr.	Frank
Delacruz	Margie
Dodson	Sherri
Enimoto	Walter
Fielding	Alex
Fletcher	Sarah
Fonseca	Rubens
Frampton	Rory
Freistat Pajimola	Sarah

Gammie	Paul
Gima	Butch
Gonzales	David “Kawika”
Griffith	Kate
Guerriero	Gabriel “Gabe”
Haase	William “Butch”
Hao	Daris
Hirata	Keomailani Hanapi
Hoke	Kawika
James	Britney
Janikowski	Valerie
Johnson	Amy
Johnson	David
Johnson	Gabe
Johnston	David
Kaahanui	Alice and Charles
Kaalekahi	Tehani
Kaauwai	Rufina
Kahue-Cabanting	U’i
Kahumoku	George
Kalaniopio-Cook	Mapuana
Kamekona	Carol Lee
Kanai	Edde
Kapu	Ke’eaumoku
Kaur	Navdeep
Kaye	Sally
Kekalia	Helen
Keoni	James
Knox	Robin
Kuoha	Iolani
Kuoha	Keoni
Lea	Heidi
Lind	Becky
Lindley	Cheryl
Lindsey	Ekolu and Puanani
Lo	Wes
Lono	Dawn
Lopes	Chandy

Low	Maluhia
MacDonald	Kai
Manna	Negus
Martin	Mahina
McEwan	Lin
McGee	Christopher
McGee	Damarice
McHugh-White	Kelly
McPherson	Mahie
Mendija	Tanya
Mentzel	Chris
Mokuau	Katy
Molitau	Kapono'ai
Mori	Amanda
Morita	Roxanne
Nelson	Lauren
Newman	Audrey
Nishimoto	Daron
Nunokawa	Scott
O'Brien	Christopher
Okamoto	Linda "Kay"
Oto-Pale	Emma Ulalia
Parker	Jesica
Pata	Pueo
Pavao	Hoku
Peardon	Tony
Pellegrino	Wallette
Penniman	Teya
Peralta	Sam
Place	Heather
Poepoe	Mahina
Powers	Keith
Preza	Diane
Pu	Susie
Pulmano	Leilani
Purdy	George
Rasmussen	Teena
Rawlins	Melanie

Rawlins-Fernandez	Keani
Reiley	Michael
Ritte	Walter
Robello	James
Robinson	Shannon
Robinson	Kekai
Rohlfing	Tricia
Ross	Gerry
Rowehl	John
Ryan	Becky
Salisbury	Jennifer
Scharnhorst	Anne
Seddon	Karen
Shaw	Diana
Shiraishi	Ulu
Shiroma	Lindsey
Sides	William “Bill”
Siliga	Kahau
Skog	Jeanne
Sprague	Johnathan
Stephens	Phillip
Strand	Darren
Sugimura	Yuki Lei
Suzuki	Jennifer
Svetin	Kimberly
Tanaka	Tylor
Tanaka	Wailani
Tarnstrom	Kari
Tech Kako’o ‘Aha Moku O Maui	
Tomita	Miki
Tucker	Ted
Udrea	Bogdan
Ulalia	Emma
Unemori	Mark
Van Heusen	Austin
Van Nostrand	King
Vaughn	Keoni
Weinhouse	Michele “Napua”

Weltman	Rob
Wordin	John (and Mrs.)
Wright	Carolyn
Yamashiro	Iolani
Yamashita	Todd
Zarbinski	Sean

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Next Steps

Phase 1 completion is based upon the required framework prescribed by the U.S. Department of Commerce, Economic Development Administration (EDA) contract specifications.

The 2022 Maui County Comprehensive Development Strategy (CEDS) document will be added to the Hawaii State CEDS and submitted to the State Office of Planning and Sustainable Development (OPSD) on August 31, 2022. There will then be a one-month period for public comment during September 2022 before submission to the EDA.

Broad dissemination of the completed Maui County CEDS to elected officials, county and state administrations, state and federal legislative delegations, non-profits, educators, and the general community at large will occur following the public comment period.

This 2022 CEDS will supersede the 2016 CEDS as the guiding document for EDA to evaluate proposals and projects requesting funding for Maui County and Hawai‘i. Other federal departments and state agencies also look to the CEDS for funding reviews.

Phase 2 will include working with the Maui Nui community again to develop an Action and Implementation Plan based on SMART Goals (Specific, Measurable, Achievable, Realistic, and Time Bound), which will guide us in bringing priorities to fruition.

A benchmarking process will be developed to track progress towards the goals, as proposed in the report (Evaluation and Performance Measures).